

Factors Associated with Accessing ICDS Services among Women in Rural Rajasthan, India

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Abstract

Background: The Integrated Child Development Services (ICDS) Scheme, launched in 1975 by the Government of India, provides various health services to children and their mothers at ICDS centres. **Objectives:** The purpose of this study is to understand 1) the extent to which women living in Rajasthan, India utilize services provided by ICDS centres and 2) the factors that are associated with their use. **Methods:** Freedom from Hunger and Freedom from Hunger India Trust, in collaboration with two local partners in Rajasthan, India, conducted a baseline assessment with 403 pregnant women and women with young children belonging to self-help groups to compare use of ICDS centres with key demographic variables and measures of poverty, food security and nutrition, curative care related to diarrhea, coping strategies, and household decision-making. **Results:** The results revealed that households that accessed ICDS services were more likely to report receiving nutrition information from ICDS centres, to purchase ORS in the last year, and to give oral rehydration solution (ORS) to children who had diarrhea. Women who decide how much food to serve each family member or spend money without discussing it first with someone else were more likely to receive benefits from ICDS centres. Those who spoke with their spouse about household nutrition needs were less likely to report accessing ICDS services. **Conclusion:** Interventions aimed at increasing utilization of ICDS centres in this region may find it beneficial to increase female participation in health care decisions, likely through spousal communication and gender relations.

Keywords

India, Integrated Child Development Services (ICDS) Scheme, Anganwadi Centres, Maternal Health, Child Health

1. Introduction

Although India has experienced an increase in food grains accompanied by economic growth, child malnutrition continues to remain higher than in many African countries [1] [2]. This paradox has become known as the “India enigma” [2]. According to latest survey conducted by the Ministry of Women and Child Development, 38.7% of children in India were stunted, 29.4% were underweight, and 15.1% were wasted in 2013-2014 [3]. While the causes of malnutrition in India are complex and interconnected, they include food insecurity, gender inequality, early marriages, teen pregnancies, poor fetal nutrition, female illiteracy, poor breastfeeding practices, frequent infections, and inadequate health care [4].

In an effort to decrease rates of malnutrition, the government of India implemented three primary approaches aimed at increasing food access. These approaches include: 1) providing price controls on staple foods, 2) providing income support through food-for-work opportunities, and 3) providing nutrition supplementation for children. The Integrated Child Development Services (ICDS) Scheme, which was launched in 1975 by the government of India, is the largest of India’s nutrition supplementation programs [1]. The ICDS Scheme provides the following services: supplementary nutrition, pre-school non-formal education, nutrition and health education, immunization, health check-up, and referral services. These services are provided at ICDS centres, which are locally known as Anganwadi centres [5].

Recent research has evaluated ICDS centres by their facilities, the knowledge possessed by their workers, or the effectiveness of specific services [1] [6] [7]. However, few studies have assessed the extent to which ICDS centre services are being utilized [8] [9]. Rao found that pregnant women living in ICDS areas were more likely to seek ante-natal care (50.2%) and immunizations (46.2%) compared to pregnant women who were not living in ICDS areas [8]. Chudasama *et al.* found that among participating ICDS centres, 61.7% had reported an interruption in the supply of nutrition supplements (in the last six months), 20% reported complete preschool education coverage, 10% had record of immunizing all children, 18.3% provided referral slips, and 8.3% actually referred sick children [9]. The purpose of this study is to understand 1) the extent to which women living in Rajasthan, India utilize services provided by ICDS centres and 2) the factors that are associated with utilizing these services.

2. Methods

2.1. Study Setting

Freedom from Hunger (FFH) and Freedom from Hunger India Trust, in collaboration with two local implementing partners in Rajasthan, India, Professional Assistance for Development Action (PRADAN) and Voluntary Association of Agricultural General Development Health and Reconstruction Alliance (VAAGDHARA) are working to improve household nutrition in the Rajasthan districts of Banswara and Sirohi. See **Figure 1**. The Rajasthan Nutrition Project

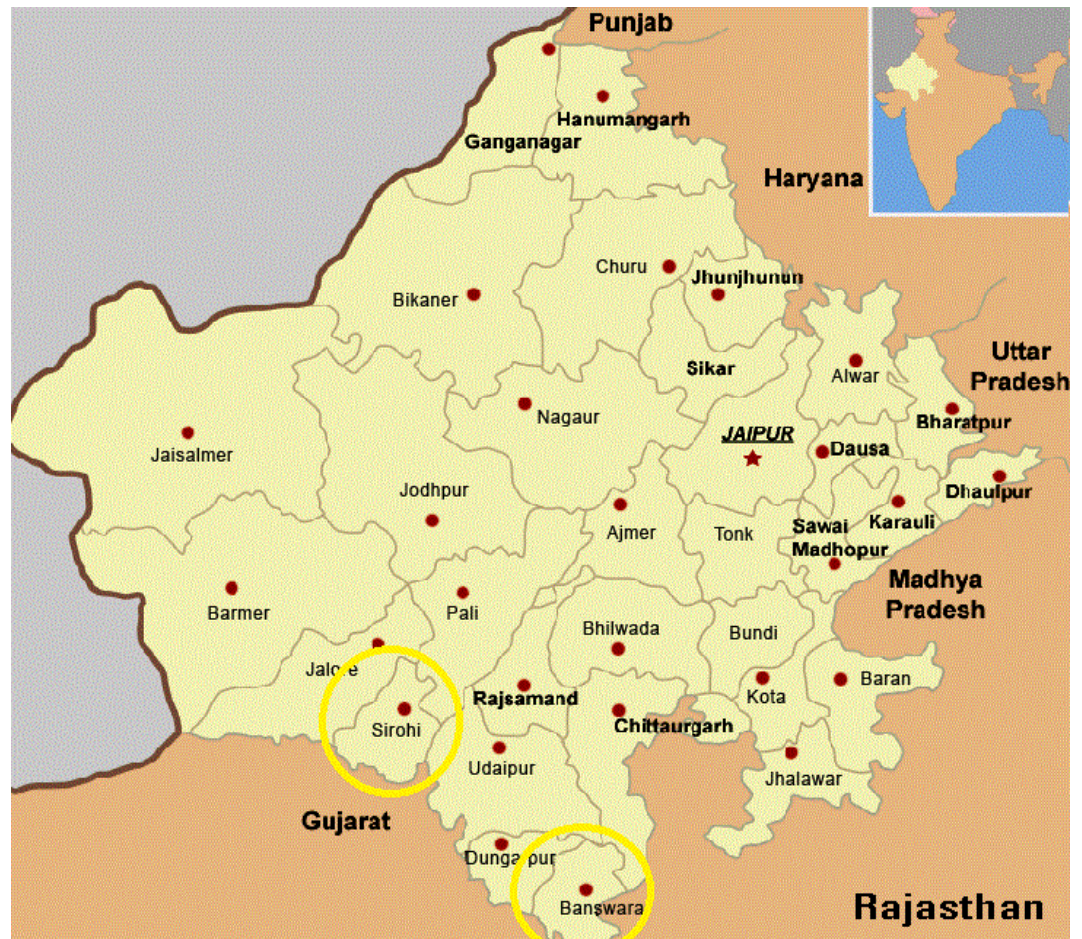


Figure 1. Map of Rajasthan.

is a cross-sectoral project designed to build on the existing women's self-help group (SHG) movement to supplement standard savings and agricultural livelihood activities with key nutrition-related interventions to reach at least 8000 SHG members and their households (an additional 28,000 family members) in Banswara and Sirohi.

2.2. Participant Selection

In May 2015, a sample of women was selected to participate in the 400 interviews planned for the baseline study. To be selected for participation, women had to meet the following criteria: 1) be SHG members from PRADAN or VAAGDHARA, 2) be in their second or third trimester of pregnancy or be mothers of children less than two years of age, and 3) live in Banswara or Sirohi district. The results of a census of all SHG members who fit the criteria revealed that 1394 women had children between 0 - 2 years of age and 250 women were pregnant.

These numbers were used to determine the final distribution of interviews. Specifically, it was decided that a simple, representative random sample would be applied, where 85% of the respondents would be mothers with children be-

tween 0 - 2 years of age and 15% would be women who were currently pregnant. Consequently, 249 mothers and 48 pregnant women from Sirohi and 91 mothers and 12 pregnant women from Banswara were interviewed for the baseline study. Respondents were notified of their selection to participate in the study by means of in-person introductions made between the research team and the field staff of VAAGDHARA and PRADAN.

2.3. Survey and Data Collection

The survey instrument was administered to 403 women, due to slight oversampling. The survey comprised questions covering several topics such as poverty, food security and nutrition, curative care related to diarrhea, coping strategies, and household decision-making. Poverty was measured using the *India Progress out of Poverty Index*[®] (PPI) Scorecard [10]. Coping strategies were measured using the Coping Strategies Index (CSI) [11], which uses 13 variables to assess respondent's coping behaviors during a food shortage. Additional health questions were taken from the FFH Health Outcomes Performance Indicators project [12] and India's Demographic and Health Survey [13].

Use of ICDS centres was assessed using the following questions. First, the interviewer asked, "During the last 12 months, have you or anyone in your family received any benefits from the anganwadi or ICDS centre (Yes/No)? If a participant responded "No," the interviewer then probed with this (Yes/No) question: "Any benefits such as supplementary food, growth monitoring, immunizations, health checkups or education? If the participant responded "Yes" to any benefits, the interviewer coded the question as "Yes." For each participant who responded that they received benefits, the interviewer asked, "If yes, did you receive any of the following: Supplementary food (Yes/No), Growth monitoring (Yes/No), Immunizations (Yes/No), Health check-up (Yes/No), Education (Yes/No), Breastfeeding support (Yes/No), Other (Yes/No).

2.4. Statistical Procedures

The International Poverty Line (IPL) \$1.25/day, IPL \$2.50/day, and National Tendulkar indices were each constructed using values from the PPI Scorecard. Raw values were generated based on question responses, summed, and were then matched with probability ranges using PPI documentation [10]. While the IPL \$1.25/day and \$2.50/day represent households living under international poverty lines of \$1.25/day and \$2.50/day, the National Tendulkar represents households living under India's national poverty line.

Coping scores were computed using guidelines provided in the CSI [11]. Examples of coping behaviors assessed included relying on less preferred or expensive foods, borrowing food or relying on help from relatives, sending household members to beg, and limiting portion size at mealtimes. Participants were assigned a value of 1 if they indicated they had participated in the coping behavior and a value of 0 if they indicated they had not participated in the coping beha-

rior. Scores were summed to generate an overall index score for coping strategies (0 = least number of coping behaviors used, 13 = most number of coping behaviors used).

SAS (version 9.4) was used to conduct all statistical analyses. Descriptive statistics were computed to describe the study sample. Unadjusted and adjusted logistic regressions were run to describe potential factors associated with accessing ICDS services.

3. Results

Table 1 displays the frequencies, percentages, and means for demographic variables. The majority of participants indicated that they were Hindu (99.8%), part of a tribe (90.8%), married (96.5%), and had children under the age of two (94.4%). A total of 21.1% of participants were currently pregnant, which was intentional due to sampling procedures. Among participants, there was an average of 3.2 children (1.7 girls and 1.6 boys). The average age of the participants' youngest child was 1.1 years of age.

Table 1. Frequencies, percentages, and means of demographic questions.

Variable	Frequency	Percent	Mean
Religion			
Hindu	402	99.8	-
Muslim	1	0.3	-
Caste or tribe			
Caste	37	9.2	-
Tribe	366	90.8	-
Marital status			
Single	6	1.5	-
Married	389	96.5	-
Separated/Divorced	1	0.3	-
Remarried	7	1.7	-
Children < 2 years old			
Yes	373	94.4	-
No	22	5.6	-
Number of children	-	-	3.2
Number of girls	-	-	1.7
Number of boys	-	-	1.6
Age of youngest child	-	-	1.1
Pregnancy status			
Yes	85	21.1	-
No	318	78.9	-

Table 2 displays the frequencies and percentages for ICDS centre variables. The majority of participants (60.6%) indicated that they themselves, or someone in their family, had received benefits from the ICDS centre in the last 12 months. Among participants who had received benefits, the most commonly received services were immunizations (89.3%) and supplementary food (84.4%). The least commonly received services were breastfeeding support (10.7%) and education (16.0%).

Table 3 displays the logistic regression comparing use of ICDS services with household decision-making variables. Most household decision-making variables were not significantly associated with accessing ICDS centre services. The only significant associations were with the variable “spoken with spouse about household food and nutrition needs in the last 6 months” (Unadjusted OR = 0.57; CI = 0.36 - 0.90). An unadjusted odds ratio provides a model for a single exposure variable and outcome variable. In an unadjusted model, respondents who had spoken with their spouse about household food and nutrition needs

Table 2. Frequencies and percentages for ICDS centre questions.

Variable	Frequency	Percent
Received benefits from ICDS centre ^a		
Yes	244	60.6
No	159	39.5
Benefits received from ICDS centre		
Supplementary food		
Yes	206	84.4
No	38	15.6
Growth monitoring		
Yes	85	34.8
No	159	65.2
Immunizations		
Yes	218	89.3
No	26	10.7
Health check-up		
Yes	82	33.6
No	162	66.4
Education		
Yes	39	16.0
No	205	84.0
Breastfeeding support		
Yes	26	10.7

^aTime frame: last 12 months.

(exposure variable) were less likely to use ICDS centres (outcome variable) compared to those who had not spoken with their spouse about household food and nutrition needs.

Table 4 displays the unadjusted and adjusted odds ratios for variables included in the logistic regression model. An adjusted odds ratio provides a model that adjusts for the confounding of other exposure variables included in the model. In an adjusted model, the variables that were significantly associated with accessing ICDS centre services included purchasing ORS for child's diarrhea (adjusted OR = 2.78; CI = 1.53 - 5.05), mother involved in decisions about health care (adjusted OR = 1.72; CI = 1.04 - 2.84), and having spoken with spouse about household food and nutrition needs (adjusted OR = 0.50; CI = 0.31 - 0.83). Respondents who had purchased ORS for child's diarrhea or were involved in decisions about health care were both significantly more likely to access ICDS

Table 3. Logistic regression for household decision-making variables.

Variable	Unadjusted OR (95% CI)	P-value
Mother involved in decisions about food purchases	1.04 (0.70 - 1.56)	0.8349
Mother involved in decisions about the amount of food to serve each family member	0.99 (0.67 - 1.48)	0.9762
Mother involved in decisions about finances	0.15 (0.74 - 1.80)	0.5335
Mother involved in decision about health care	1.38 (0.89 - 2.15)	0.1492
Mother involved in decisions about visits to family	1.29 (0.85 - 1.96)	0.2352
Mother had spoken with spouse about household food and nutrition needs ^a	0.57 (0.36 - 0.90) ^b	0.0160 ^b
Mother had unrestricted access to any income	0.72 (0.46 - 1.12)	0.1492
Mother spends money without first discussing it with someone else, such as husband	1.47 (0.69 - 3.14)	0.3154

^aTime frame: last 6 months; ^bSignificant p-value.

Table 4. Logistic regression model.

Quantitative Variable	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
PPI NPL	1.00 (0.99 - 1.01)	0.6689	1.01 (1.00 - 1.02)	0.2450
CSI	0.93 (0.84 - 1.04)	0.1906	0.91 (0.80 - 1.03)	0.1229
Mother's food security	1.17 (0.72 - 1.93)	0.5266	1.24 (0.69 - 2.25)	0.4732
Mother purchased ORS for child's diarrhea ^a	2.61 (1.45 - 4.67)	0.0013 ^c	2.78 (1.53 - 5.05)	0.0008 ^c
Mother involved in decisions about health care	1.38 (0.89 - 2.15)	0.1492	1.72 (1.04 - 2.84)	0.0345 ^c
Mother spoke with spouse about household food and nutrition needs ^b	0.57 (0.36 - 0.90)	0.0160 ^c	0.50 (0.31 - 0.83)	0.0064 ^c
Mother believes a child should be exclusively breastfed for 6 months	1.19 (0.78 - 1.80)	0.4242	1.28 (0.82 - 2.00)	0.2843

^aTime frame: last 12 months; ^bTime frame: last 6 months; ^cSignificant p-value.

centre services compared to their counterparts. Respondents who had spoken with their spouse about household food and nutrition needs were significantly less likely to access ICDS centre services compared to those who had not spoken with their spouses about household food and nutrition needs.

4. Discussion

The purpose of this study was to assess ICDS centre usage among women in rural Rajasthan and characteristics of households accessing these centres. The findings of the current study indicate that the majority of households in this region utilized services from ICDS centres, the most prominent of which were immunization and supplementary food services. Other research suggests that supplementary food services have become the primary focus of many ICDS centres [14]. While such services can improve childhood health outcomes, a focus on food supplementation exclusively comes at the expense of other program components [14] that may be more cost-effective at improving childhood health, such as breastfeeding promotion [15]. Interestingly, this study found that breastfeeding is among the least utilized ICDS services, despite low breastfeeding prevalence in this region. The Indian government reported in a 2015–2016 health survey that only 28.4% of children under 3 years were breastfed within one hour of birth and only 58.2% of children under 6 months were breastfed exclusively in Rajasthan [16]. While supplementary food services are important, ICDS centre administrators may consider shifting administrative and financial resources to promoting breastfeeding and other services.

Most of the decision-making variables assessed in this study were not significantly associated with ICDS service use. One exception was female involvement in health care decisions, which was positively associated with ICDS use. Predictors of female participation in household health care decisions include increased number of children, education, and age [17]. Increasing female participation in household health care decisions may be an efficient tactic to increase not only ICDS service use, but use of other health services. Research indicates that female participation in health care decisions influences participation in important health care services, including reproductive and prenatal care [18]. Addressing household decision-making patterns usually involves addressing gender norms [19]. While increasing numbers of interventions targeting harmful gender norms strive to involve men, research suggests that the most successful interventions to improve gender relations and decision-making norms still revolve around empowerment, including increasing access to educational and economic resources and reducing child marriage [19].

Another decision-making variable that was significantly associated with assessing ICDS services was speaking with spouse about household nutrition needs. Those who spoke with their spouse about these needs were less likely to report accessing ICDS services. One possible explanation for this finding is that women who discuss household nutrition needs are at a financial advantage

which precludes them from needing to use ICDS services. Although prior research suggests that there is a relationship between poverty status and use of ICDS centres [20], the PPI was not associated with accessing ICDS centres in our study. One reason why we did not see an association between these variables is that women in the SHG may be relatively homogenous in poverty status. As PPI is not associated with accessing ICDS centres, it is unlikely that being at a financial advantage explains why those who speak to their husbands about household nutrition do not use ICDS centres.

There are several more likely explanations for the relationship between speaking with spouse about household nutrition needs and accessing ICDS services. First, because ICDS services specifically target women, they do not feel the need to speak with their husbands about their household nutrition needs. Instead, these women utilize ICDS services to address their household nutrition needs. Second, women who speak with their husbands about nutrition may be more likely to discuss the use of other available health services, such as private health services, with their husbands. As a result, they may choose to use private health services more often, and ultimately decrease or discontinue their use of ICDS centres. Third, women who have to talk with their husbands about food needs may feel less empowered to use ICDS services.

Another significant determinant of ICDS centre use was having purchased ORS to treat a child with diarrhea. It is uncertain whether the use of ORS is a result of ICDS centre use (*i.e.*, women use ORS after learning about them at ICDS centres) or a predictor (*i.e.*, women who use ORS are usually more educated about other health care resources). In 2014, ICDS and health departments in India embarked on a joint campaign to increase ORS knowledge and use, which could provide early evidence for the former. The campaign entailed door-to-door distribution of ORS, demonstrations of how to use ORS at hospitals and primary health centres, and promotion of other preventive behaviors, including breastfeeding [21]. While the impact of the campaign thus far is uncertain, ORS plays a key role in preventing diarrheal disease and maternal education of ORS has been shown to increase ORS usage [22].

Results from this study indicate that few expected factors, including income and many decision-making variables, were associated with ICDS centre use. It appears from other research of household income and ICDS centres usage that the relationship varies by region [7] [14] [23]. While ICDS goals do not explicitly mention reaching high-need, low-income populations, it would be hoped that research would indicate a disproportionate usage of ICDS services by these populations. While research of household access to ICDS services is important, such efforts usually rest on the assumption that such services are effective at improving childhood health outcomes to begin with. Studies of ICDS centre effectiveness are conflicting, with some studies reporting success [7] and others reporting low effectiveness at reducing childhood malnutrition in the long-term due to operational challenges and disparities in access [1] [14]. Perhaps due to con-

flicting research, ICDS centres have faced major budget cuts, including a 7% reduction in 2016 [24]. As ICDS centres are one of the most prominent programs for improving childhood health in India [6], future studies of both access to and effectiveness of ICDS programs, especially in the face of major resource shortages, are important.

This study should be interpreted within the context of a few limitations. First, the survey question measuring ICDS centre access asked participants whether they had accessed services over the past 12 months. This timeframe may overestimate or mischaracterize true use of ICDS centres. Further studies measuring ICDS use over time may be beneficial in order to accurately reflect use. Second, many decision-making questions, including inter-gender communication, were included in this study. The survey neglected to measure the role of other gatekeepers involved in decision-making, especially mothers-in-law, who are often involved in important household decisions. The results of this study may inaccurately reflect decision-making patterns among households in this region. Further study of third-party influences on decision-making may be of importance.

5. Conclusion

Our findings suggest that in rural Rajasthan, the majority of individuals access ICDS centres, especially supplementary food services. While supplementary food services can be effective in reducing childhood undernutrition, ICDS services in this region may consider increasing focus on other cost-effective and underutilized services, including breastfeeding education. Many hypothesized determinants of ICDS centre use in this study proved insignificant, the reasons for which are unclear. However, interventions aiming to increase utilization of ICDS centres in this region may find it beneficial to increase female participation in health care decisions, likely through improved spousal communication and gender relations.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Ethical Approval

This research represents a secondary data analysis of de-identified data initially

collected for the purposes of program evaluation. Because Freedom from Hunger and partners originally collected data for program evaluation (and not with the intention to publish), this study was exempt from IRB approval.

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