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Utilization of ICDS Services, Associated Factors, and System Level Challenges at Anganwadi Centres in Rural Rajasthan: A Cross-Sectional Study

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ABSTRACT

Introduction: Child undernutrition remains a major public health issue in India. Despite wide coverage of Integrated Child Development Services (ICDS) services, their utilization is inconsistent due to socio-demographic and systemic factors. This study assesses utilization, associated determinants, and system-level challenges at Anganwadi Centres (AWCs) in rural Rajasthan to identify gaps and improve programme effectiveness.
Materials and Methods: Acommunity-based cross-sectional study was conducted in rural Jaipuramong 1052 ICDS beneficiaries using universal sampling. Data were collected through interviews, observations, and record review. Service utilization and associated factors were assessed. Data were analyzed using SPSS with descriptive statistics and appropriate tests, considering $p<0.05$ as statistically significant.
Results: A total of 1052 beneficiaries were included, with children forming the largest group. While weight monitoring was well utilized, other child services were suboptimal. Adolescent girls showed moderate utilization, whereas pregnant and lactating women had lower uptake. Socio-economic status, attendance, and home visits were significant predictors. Anganwadi workers (AWWs) reported inadequate honorarium, workload, and administrative challenges.
Conclusion: ICDS service utilization in rural Rajasthan was moderate, with gaps among pregnant and lactating women. Socio-economic status, attendance, and home visits influenced uptake. Strengthening community engagement and improving Anganwadi worker support are essential to enhance service delivery and health outcomes.

Keywords*: ICDS, children, pregnant women, lactating mothers, adolescent girls, Angadwadi Workers, AngadwadiCentres.*

INTRODUCTION

Child health and nutrition continue to be major public health challenges in developing countries, particularly in India, where a considerable proportion of children suffer from undernutrition and its associated consequences. National data indicate a high prevalence of stunting, wasting, and underweight among children under five years of age, reflecting persistent gaps in the delivery and utilization of essential health and nutrition services [1]. These conditions not only affect physical growth but also impair cognitive development, reduce future productivity, and hinder overall human capital development. In response to these challenges, the Government of India launched the Integrated Child Development Services (ICDS) scheme in 1975, which has evolved into one of the largest community-based programmes for early childhood care and development. The scheme provides a comprehensive package of services, including supplementary

nutrition, immunization, health check-ups, referral services, nutrition and health education, and non-formal pre-school education through Anganwadi Centres (AWCs) [2]. Over the years, ICDS has expanded substantially, targeting children, pregnant and lactating women, and adolescent girls, particularly in rural and underserved areas [3].

Despite its extensive coverage, the effectiveness of ICDS in improving health and nutritional outcomes has been inconsistent. Evidence suggests that the mere availability of services does not ensure their optimal utilization. Various socio-demographic factors such as socio-economic status, literacy, awareness, and accessibility significantly influence the uptake of ICDS services [4,5]. Additionally, systemic issues including inadequate infrastructure, irregular supply of supplementary nutrition, excessive workload on Anganwadi workers, and limited community participation have been identified as key barriers to effective service delivery [6]. Furthermore, the role of frontline workers, particularly Anganwadi workers, is critical in ensuring effective programme implementation; however, the challenges they face may adversely impact service delivery and utilization [6,7]. Previous studies have also demonstrated considerable regional variations in the utilization of ICDS services, indicating the need for localized assessments to better understand context-specific challenges [8,9]. Rural regions, especially in states like Rajasthan, continue to experience disparities in health and nutrition indicators despite the presence of ICDS services [3,5]. Therefore, a comprehensive evaluation of service utilization, associated factors, and system-level challenges is essential to identify gaps and improve programme effectiveness. In this context, the present study was undertaken to assess the utilization of ICDS services, associated factors, and system challenges at Anganwadi Centres in rural Rajasthan.

MATERIAL AND METHOD:

This community-based cross-sectional descriptive study was conducted in the rural field practice area of Achrol, Jaipur district, Rajasthan, over a period of 19 months from December 2014 to June 2016. The study area comprised all Anganwadi Centres (AWCs) that had been functional for at least one year prior to the commencement of the study. The study population included all beneficiaries registered and available at the selected AWCs, namely children aged 0–6 years, adolescent girls (10–19 years), and pregnant and lactating women. A universal sampling approach was adopted, wherein all eligible and available beneficiaries enrolled at the AWCs during the study period were included. A total of 1052 beneficiaries were covered, and this constituted the final sample size. All registered beneficiaries who were regular attendees at the AWCs and consented to participate were included in the study. Anganwadi Workers (AWWs) and Helpers (AWHs) associated with the selected centres were also included. Beneficiaries who were irregular in attendance (defined as absence for ≥3 consecutive sessions or >7 days in the preceding 3 months) or unwilling to participate were excluded.

Data were collected using a pre-tested, semi-structured questionnaire administered through face-to-face interviews. Separate interview schedules were used for beneficiaries, mothers of children, adolescent girls, and AWWs/AWHs. Information regarding socio-demographic characteristics, utilization of ICDS services, and problems faced by AWWs was obtained. In addition, on-site observations were conducted to assess the functioning of AWCs, including pre-school education activities, supplementary nutrition preparation and distribution, and growth monitoring practices. Record review of registers, stock availability, and infrastructure facilities was also performed. Household visits were carried out when required to validate information and interact with beneficiaries. Service utilization was assessed in terms of access to supplementary nutrition, immunization, health check-ups, and preschool education. The collected data were coded and entered into Microsoft Excel and analyzed using SPSS version 20. Descriptive statistics such as frequencies and percentages were calculated. Associations between variables were assessed using appropriate statistical tests, and a p-value of less than 0.05 was considered statistically significant.

RESULT:

A total of 1052 beneficiaries were included in the study. As seen in Figure 1, among them, the largest proportion comprised children aged 0–6 years (454; 43.2%). Pregnant women accounted for 223 (21.2%) of the participants, followed by lactating mothers (201; 19.1%). Adolescent girls represented the smallest group, constituting 174 (16.5%) of the study population. Overall, children formed nearly half of the study participants, while the remaining distribution was relatively balanced among pregnant women, lactating mothers, and adolescent girls.

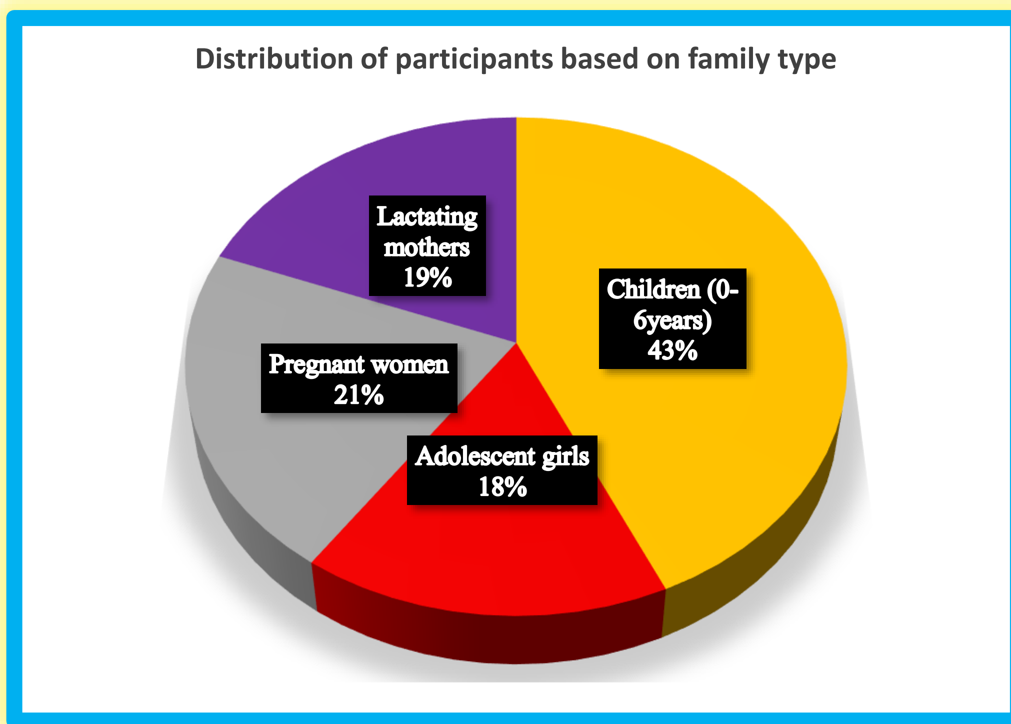

Figure 1:Distribution of study participants.

The socio-demographic profile of the study participants can be seen in Table 1. Among children aged 0–6 years, a majority were in the 3–6 years age group (337; 74.2%), while 117 (25.8%) were aged 0–3 years. Among adolescent girls, 102 (58.6%) belonged to the 10–14 years age group and 72 (41.4%) were aged 15–19 years. Most of the pregnant women (199; 89.2%) and lactating mothers (181; 90%) were aged 20 years or above, with a smaller proportion below 20 years (10.8% and 10%, respectively). Regarding literacy status, the majority of participants across all groups were literate. Among adolescent girls, 119 (68.4%) were literate, while 55 (31.6%) were illiterate. Similarly, 159 (71.3%) pregnant women and 143 (71.1%) lactating mothers were literate, whereas 64 (28.7%) and 58 (28.9%), respectively, were illiterate. In terms of socio-economic status, as per the Modified B.G. Prasad scale (2015), a slightly higher proportion of participants across all groups belonged to the lower socio-economic classes (Class IV and V). Among children, 232 (51.1%) were from Class IV and V, compared to 222 (48.9%) from Class I–III. A similar pattern was observed among adolescent girls (51.7% vs 48.3%), pregnant women (52% vs 48%), and lactating mothers (51.3% vs 48.7%).

Table 1: Socio-demographic characteristics of study participants

Variable		**Category**	**n (%)**
Age in years	Children	0–3	117 (25.8)
		3–6	337 (74.2)
	Adolescent girls	10-14	102 (58.6)
		15-19	72 (41.4)
	Pregnant women	< 20	24 (10.8)
		≥ 20	199 (89.2)
	Lactating mothers	< 20	20 (10)
		≥ 20	181 (90)
Literacy status	Adolescent girls	Illiterate	55 (31.6)
		Literate	119 (68.4)
	Pregnant women	Illiterate	64 (28.7)
		Literate	159 (71.3)
	Lactating mothers	Illiterate	58 (28.9)
		Literate	143 (71.1)
Socio-economic class (according to Modified	Children	Class I-III(≥ Rs1739)	222 (48.9)
		Class IV & V (< Rs1739)	232 (51.1)

B.G. Prasad scale 2015)	Adolescent girls	Class I-III (≥ Rs1739)	84 (48.3)
		Class IV & V (< Rs1739)	90 (51.47)
	Pregnant women	Class I-III (≥ Rs1739)	107 (48)
		Class IV & V (< Rs1739)	116 (52)
	Lactating mothers	Class I-III (≥ Rs1739)	98 (48.7)
		Class IV & V (< Rs1739)	103 (51.3)

The utilization of ICDS services among children (n = 454) is presented in Table 2. A majority of children (338; 74.5%) received monthly weight monitoring regularly, while 86 (18.9%) received it sometimes and 30 (6.6%) never received this service. However, consistent communication regarding growth monitoring was limited, with only 50 (11%) caregivers reporting that growth charts were discussed every time, whereas 266 (58.6%) reported occasional discussion and 138 (30.4%) reported no discussion at all. Home visits by Anganwadi workers were inadequate, as more than half of the beneficiaries (237; 52.2%) reported never receiving home visits, while 167 (36.8%) received them sometimes and only 50 (11%) reported regular visits. Similarly, the provision of medicines from Anganwadi centres was suboptimal. Only 85 (18.7%) of children always received medicines, whereas 166 (36.6%) received them sometimes and a larger proportion (203; 44.7%) never received any medicines. Utilization of pre-school education services was also low, with more than half of the children (242; 53.2%) never attending regularly. Only 77 (16.9%) attended regularly, while 136 (29.9%) attended sometimes. Overall, while weight monitoring services showed relatively better coverage, other components of ICDS services, including growth chart counselling, home visits, supplementary medicine provision, and pre-school education, were inadequately utilized

Table 2: Utilization of ICDS services amongchildren(n=454)

Service Indicator	Yes n(%)	Sometimes n(%)	Never n(%)
Monthly weight monitoring	338 (74.5)	86 (18.9)	30 (6.6)
Growth chart discussion during each visit	50 (11)	266 (58.6)	138 (30.4)
Regular home visit by AWW	50 (11)	167 (36.8)	237 (52.2)
Consistently received medicine from respective AWC	85 (18.7)	166 (36.6)	203 (44.7)
Regular pre-school education	77 (16.9)	136 (29.9)	242 (53.2)

The utilization of ICDS services among adolescent girls, pregnant women, and lactating mothers is presented in Table 3. Among adolescent girls (n = 174), service utilization was relatively consistent across indicators, with around two-thirds availing services. Regular attendance at Anganwadi centres was reported by 107 (61.5%) participants. Similarly, 108 (62.1%) received health education, while 107 (61.5%) underwent health check-ups and received nutritional supplementation. Iron and folic acid (IFA) supplementation and deworming tablet consumption were reported by 111 (63.8%) adolescent girls each. Among pregnant women (n = 223), utilization patterns varied across services. While a high proportion reported IFA consumption (191; 85.7%) and utilization of referral services (189; 84.8%), less than half received regular health check-ups (106; 47.5%). Nutritional supplementation was comparatively low, with only 85 (38.1%) beneficiaries reporting its utilization. Similarly, among lactating mothers (n = 201), utilization of services was suboptimal. Only 77 (38.3%) reported regular health check-ups, and 97 (48.3%) received nutritional supplementation. Referral services were utilized by slightly more than half of the participants (107; 53.2%). Overall, while adolescent girls demonstrated moderate and relatively uniform utilization across services, pregnant women and lactating mothers showed higher utilization for selective services such as IFA consumption and referrals, but lower uptake of regular health check-ups and nutritional supplementation.

Table 3:Utilization of services by adolescent girls, pregnant women and lactating mothers

Service Indicator		Yes n (%)	No n (%)
Adolescent Girls n=174	Regular attendance	107(61.5)	67 (38.5)
	Health education	108 (62.1)	66 (37.9)
	Health check-ups	107(61.5)	67 (38.5)
	Nutritional supplement	107 (61.5)	67 (38.5)
	IFA supplementation	111 (63.8)	63 (36.2)
	Deworming tablets	111 (63.8)	63 (36.2)
Pregnant Women n=223	Regular health check-up	106 (47.5)	117 (52.5)
	IFA consumption	191 (85.7)	32 (14.3)
	Nutritional supplement	85 (38.1)	138 (61.9)
	Referral services	189 (84.8)	34 (15.2)

Lactating Mothers n=201	Regular health check-up	77 (38.3)	124 (61.7)
	Nutritional supplementation	97 (48.3)	104 (51.7)
	Referral services	107 (53.2)	94 (46.8)

The results of logistic regression analysis identifying factors associated with utilization of ICDS services are presented in Table 4. Socio-economic status, regular attendance at Anganwadi centres, and home visits by Anganwadi workers were found to be significant predictors of ICDS service utilization. Participants belonging to higher socio-economic classes (Class I–III) had significantly higher odds of utilizing ICDS services (AOR = 2.1; 95% CI: 1.4–3.2; p = 0.001). Regular attendance at Anganwadi centres emerged as the strongest predictor, with participants who attended regularly being 4.5 times more likely to utilize ICDS services compared to those who did not (AOR = 4.5; 95% CI: 2.5–8.0; p < 0.001). Additionally, beneficiaries who received home visits by Anganwadi workers had significantly higher utilization (AOR = 1.8; 95% CI: 1.1–2.9; p = 0.02). In contrast, age (≥20 years) (AOR = 1.2; 95% CI: 0.8–1.8; p = 0.25) and literacy status (AOR = 1.3; 95% CI: 0.9–1.9; p = 0.10) were not found to be statistically significant predictors of ICDS service utilization. Overall, the findings indicate that program engagement factors, particularly regular attendance and outreach through home visits, play a more critical role in determining ICDS service utilization than basic socio-demographic characteristics such as age and literacy.

Table 4:Binary logistic regression analysis of factors affecting utilizationof ICDS services

Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Age (≥20 years)	1.2	0.8–1.8	0.25
Literacy (Literate)	1.3	0.9–1.9	0.10
Socio-economic status (Class I–III)	2.1	1.4–3.2	**0.001**
Regular attendance	4.5	2.5–8.0	**<0.001**
Home visits by AWW	1.8	1.1–2.9	**0.02**

The challenges faced by Anganwadi workers (AWWs) are presented in Table 5. All AWWs (21; 100%) reported inadequate honorarium as a major problem, making it the most universally cited issue. A high proportion of workers also reported excessive workload (17; 80.9%) and burden of record maintenance (17; 80.9%). Lack of community support was reported by 13 (61.9%) AWWs, while 11 (52.4%) highlighted inadequate supervision as a concern. Issues related to ration supply were reported by 9 (42.9%) workers. Additionally, absenteeism among beneficiaries was reported as a challenge by 7 (33.3%) AWWs. Overall, financial constraints, administrative burden, and operational challenges emerged as the key issues affecting the functioning of Anganwadi workers.

Table 5:Problems faced by AWWs

Problem	n (%)
Inadequate honorarium	21 (100)
Excessive workload	17 (80.9)
Record maintenance burden	17 (80.9)
Lack of community support	13 (61.9)
Inadequate supervision	11 (52.4)
Beneficiary absenteeism	7 (33.3)
Ration supply related	9 (42.9)

DISCUSSION:

The present study assessed the utilization of ICDS services among different beneficiary groups and identified associated factors and system-level challenges in rural Rajasthan. The findings revealed variable utilization across services, with relatively better coverage among children and adolescent girls compared to pregnant and lactating women. In the present study, a majority of children received regular weight monitoring, indicating satisfactory coverage of basic growth monitoring services. This finding is supported by Kumar P et al. [9], who reported adequate coverage of child health services under ICDS in several districts of India. However, our study found poor utilization of growth chart counselling, home visits, and pre-school education services. Similar gaps in service quality and counselling have been reported by Jawahar P et al. [8]. In contrast, a study by Sharma et al. [10] observed better utilization of pre-school education services, suggesting regional differences in service delivery and community engagement. Among adolescent girls, the present study showed moderate and consistent utilization of services such as health education, IFA supplementation, and deworming. These findings are in agreement with Gupta A et al. [11], who reported similar levels of service uptake among adolescent girls. However, a study by Verma et al. [12] reported lower utilization due to lack of awareness and irregular attendance,

which contrasts with the relatively better engagement observed in our study. Utilization among pregnant and lactating women was found to be suboptimal for key services such as regular health check-ups and nutritional supplementation. This finding is supported by Patil SB et al. [5], who also reported inadequate utilization of supplementary nutrition services among mothers in rural India. Similarly, Panda PK et al. [6] highlighted gaps in service delivery for maternal beneficiaries. However, our study found higher utilization of IFA consumption and referral services, which is in contrast to findings by Reddy et al. [13], where these services were less utilized. These variations may reflect differences in program implementation and health system strengthening across regions.

The logistic regression analysis in the present study identified socio-economic status, regular attendance, and home visits by Anganwadi workers as significant predictors of ICDS service utilization. These findings are consistent with NITI Aayog [3] and Avula Ret al. [4], who emphasized the role of socio-economic factors and accessibility in influencing service uptake. The strong association between regular attendance and utilization observed in our study is also supported by Khan et al. [14], who reported that active participation significantly improves service utilization. In contrast, age and literacy were not found to be significant predictors in this study, which differs from findings by Jain Iet al. [15], where education level was a key determinant. This discrepancy may be due to contextual factors such as community-level awareness and outreach activities. The present study also highlighted several challenges faced by Anganwadi workers, including inadequate honorarium, excessive workload, and record maintenance burden. Similar findings have been reported by Sabat S et al. [7] and Kumari et al. [16], who identified financial dissatisfaction and administrative overload as major barriers affecting service delivery. Additionally, issues such as lack of community support and inadequate supervision observed in our study are supported by findings from Joseph et al. [17]. Overall, the study indicates that while ICDS services have achieved moderate coverage, significant gaps remain in effective utilization, particularly among women beneficiaries. Strengthening supportive supervision, improving working conditions of Anganwadi workers, and enhancing community participation are crucial for improving the overall effectiveness of ICDS services.

CONCLUSION:

The present study highlights that while the Integrated Child Development Services (ICDS) scheme has achieved moderate coverage in rural Rajasthan, significant gaps persist in the effective utilization of its services. Utilization was relatively better among children and adolescent girls; however, pregnant and lactating women demonstrated lower uptake, particularly for nutritional supplementation and regular health check-ups. Key determinants influencing utilization included socio-economic status, regular attendance at Anganwadi centres, and home visits by Anganwadi workers, emphasizing the importance of both accessibility and active engagement. The study also identified critical system-level challenges such as inadequate honorarium, excessive workload, and administrative burden among Anganwadi workers, which may adversely affect service delivery. These findings underscore the need for strengthening both demand-side and supply-side components of ICDS. The implications of this study suggest that improving community awareness, promoting regular attendance, and enhancing outreach through home visits can significantly improve service utilization. Additionally, policy-level interventions focusing on better remuneration, supportive supervision, and reduction of workload for Anganwadi workers are essential. Strengthening these aspects can enhance the overall effectiveness of ICDS and contribute to improved maternal and child health outcomes in rural settings.

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