

# Effectiveness of Integrated Child Development Services (ICDS) in Reducing Child Malnutrition in India: A Systematic Review

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## Abstract

India continues to face a heavy burden of childhood undernutrition. This systematic review examines whether Integrated Child Development Services (ICDS) – India’s flagship early childhood program – has measurably improved child nutrition. This study synthesized recent secondary analyses of national surveys and program evaluations. Between 2016 and 2021, ICDS coverage expanded markedly; one large study found utilization grew from 58% to 71% and underweight prevalence fell from 37% to 32%, with ICDS expansion explaining about 9–12% of that improvement. Another study reported that children using ICDS services had about 19% higher odds of dietary diversity and more frequent animal-source foods, though ICDS did not improve overall meal adequacy or frequency. However, ICDS coverage gaps remain: children with severe acute malnutrition were not especially more likely to receive services, indicating targeting inefficiencies. Persistent issues – underfunding, weak infrastructure, poorly paid workers, and over-centralized management – limit ICDS impact. The study concludes that ICDS has had modest positive effects on child nutrition, but significant program quality improvements and targeting reforms are needed to accelerate reductions in malnutrition.

**Keywords:** Child Malnutrition, ICDS, Nutrition Programs, Poshan Abhiyan, Early Childhood Care

## 1. Introduction

Child undernutrition – including stunting, wasting, and underweight – remains widespread in India (Kumar, Selvamani, & Singh, 2026). For example, National Family Health Survey (NFHS-5, 2019–21) data show that roughly one-third of children six years are underweight and over one-third are stunted (Kumar, Selvamani, & Singh, 2026). Undernutrition greatly increases risks of infection, mortality, and impaired development: it contributes to about 20% of child deaths globally (Singh, et al., 2024). To address this, the Government of India launched the Integrated Child Development Services (ICDS) scheme in 1975, now the world’s largest early childhood care and nutrition program (Singh, et al., 2024). ICDS targets children up to age six and pregnant/lactating women, providing a package of services through local Anganwadi centers (AWCs), including daily supplementary nutrition, growth monitoring, immunizations, health check-ups, nutrition/health education and pre-school education (Singh et al., 2024). The program’s stated objectives are to improve child/maternal nutrition and health and lay the foundation for proper child development (Singh et al., 2024).

Despite its scale, ICDS effectiveness is debated. Reviews note that ICDS has prioritized nutrition supplementation, but suffers from chronic funding and logistical shortfalls (Singh et al., 2024). For instance, (Prasad, 2025) observes that although coverage expanded, ICDS still lacks adequate investment, sufficient Anganwadi infrastructure, fair compensation/training for workers, and meaningful community involvement. It remains unclear how much ICDS has reduced undernutrition nationwide. This review, therefore, systematically evaluates evidence from surveys and studies on ICDS outcomes for child nutrition in India, seeking to clarify its overall impact and identify gaps in implementation.

## 2. Significance

Child malnutrition underlies a large share of India's disease burden and mortality (Khairkar et al., 2024). A recent analysis notes that stunting and underweight together account for roughly 20% of all deaths under age five (Singh et al., 2024). Persistently high malnutrition rates hinder human capital: malnourished children suffer impaired cognitive development, reduced school achievement, and long-term health problems (Kirolos et al., 2022). ICDS represents a major public investment intended to break this cycle; thus, assessing its effectiveness is critical. By synthesizing national- and state-level data, this review informs policymakers whether ICDS is fulfilling its goals. The findings help identify which ICDS components work, where coverage lags, and what reforms are needed to accelerate progress toward the SDGs on ending hunger and improving child health.

## 3. Aim and Objectives

This study aims to Evaluate the effectiveness of Integrated Child Development Services (ICDS) in reducing child malnutrition (stunting, wasting, underweight) in India through a systematic review of secondary data.

The objectives of the study are as follows:

1. To assess the coverage and utilization of ICDS services among children and mothers.
2. To identify socio-economic and demographic disparities in ICDS impact.
3. To analyze implementation challenges and service delivery quality in ICDS.
4. To suggest policy recommendations to improve ICDS effectiveness.

## 4. Methodology

- **Review Type:** Systematic review of published studies, reports, and survey analyses on ICDS and child nutrition.
- **Data Sources:** Data were analyzed from academic databases (PubMed, Google Scholar, Springer, Wiley) and official repositories (Ministry of Women and Child Development reports, NFHS data) for relevant material (2000–2025). This study included peer-reviewed studies and government publications that analyzed ICDS program indicators and child nutritional outcomes.
- **Inclusion Criteria:** Studies focusing on children (0–6 years) and mothers in India, analyzing ICDS interventions (e.g. supplementary feeding, Anganwadi attendance) and nutrition outcomes (stunting, wasting, underweight, dietary diversity). Quantitative and mixed-method analyses were included.
- **Exclusion Criteria:** non-English publications, studies without primary data on ICDS and child nutrition, case reports, and reviews without data.

- **Data Extraction:** Key information was extracted from each source, including study design (survey, observational, etc.), sample, time period, ICDS coverage measures, nutrition indicators, and main findings.
- **Data Analysis:** Findings were synthesized qualitatively. Important outcome measures were summarized (e.g. changes in underweight prevalence, odds ratios for dietary outcomes) and compared across studies. Whenever possible, quantitative effect sizes (percent change, odds ratios) were noted.
- **Limitations:** Sources varied in methodology (e.g. difference-in-differences using NFHS, cross-sectional regressions), so heterogeneity precluded meta-analysis. This review is limited by potential publication bias and the observational nature of most data. Changes in underlying socio-economic conditions can also confound interpretations.

## 5. Review of Literature

**National survey analyses:** Using NFHS data, Singh et al. (2024) compared child underweight prevalence before and after ICDS expansion, finding that increased ICDS use had a measurable but modest effect (Singh et al., 2024). Specifically, they reported that ICDS service coverage rose nationally from 58% to 71% between 2016 and 2021, and this expansion explained about 9–12% of the 5-percentage point decline in underweight among children aged 6–59 months (Singh et al., 2024). Their conclusion was that improving the quality of ICDS interventions could have a modest but meaningful impact on reducing underweight (Singh et al., 2024). Kumar et al. (2025) analyzed NFHS-4 data to assess complementary feeding. They found that children aged 6–23 months whose mothers used ICDS services were about 19% more likely to receive a sufficiently diverse diet and approximately 27% more likely to consume eggs or flesh foods than non-users (Kumar et al., 2025). However, receipt of ICDS did not significantly improve the minimum acceptable diet index or meal frequency, and actually appeared to be negatively associated with meal frequency requirements (Kumar et al., 2025). These findings indicate some beneficial nutritional behaviours for ICDS beneficiaries, but also persistent gaps in feeding adequacy.

**State and district evaluations:** Smaller studies at the state level have yielded mixed results. For example, (Dutta & Ghosh, 2016) studied children in West Bengal and found no statistically significant difference in underweight prevalence between ICDS-enrolled and non-enrolled children (Singh et al., 2024). Similarly, prior reports (Dixit et al., 2018; Thakur et al., 2011) found limited evidence that ICDS enrolment alone improves nutritional status (Singh et al., 2024). One local study in rural India using propensity score matching (Dixit et al., 2018) also showed no significant nutritional advantage from ICDS, except that daily supplementary feeding was associated with slight improvements in growth for some subgroups (Singh et al., 2024). Overall, these results suggest that mere participation in ICDS (e.g., receiving take-home rations) often did not translate into large improvements in weight-for-age or stunting in some settings, perhaps due to differences in how the program was delivered.

**Equity and coverage studies:** (Chakraborty et al., 2024) specifically examined ICDS coverage among severely acutely malnourished (SAM) children using NFHS-5. They found that overall ICDS service use was actually **lower** among SAM children than among better-nourished peers, despite ICDS provisions for SAM. For instance, older and rural children with SAM were somewhat more likely to receive services, but there was *no evidence* that ICDS was specifically reaching SAM children more than others (Chakraborty et al., 2024). In fact, some components of ICDS had lower coverage among SAM children. They concluded that without stronger outreach (e.g., through maternal services), ICDS may fail to cover those in greatest need. Other work highlights geographic disparities. NFHS-5 data show that states such

as Maharashtra and Gujarat still have very high SAM prevalence (over 10%), whereas some states (Odisha, Karnataka) achieved much higher service coverage (Chakraborty et al., 2024). This suggests ICDS impact varies greatly by region and that best-performing states may offer lessons.

**Implementation challenges:** Several reviews emphasize systemic constraints. (Prasad, 2025) notes that despite decades of ICDS, key bottlenecks persist (Prasad, 2025). Inadequate funding and poor infrastructure at Anganwadi centers limit the quantity and quality of services. Anganwadi workers are often underpaid and overburdened, weakening service delivery. The program's centralized administration curtails local adaptation, and community participation remains low (Prasad, 2025). Surveys also find that many intended beneficiaries are missed (e.g., some women or children do not enrol) (Jayalakshmi & Kannan, 2023) and that portions of funding may not effectively reach end-users (Singh, 2020). In sum, the literature reveals that while ICDS has broad reach, its influence on nutrition outcomes is often dampened by implementation weaknesses.

## 6. Results

The study identified several consistent findings across studies:

- **Increased ICDS coverage:** Multiple sources report that ICDS participation has grown. National data show any-ICDS coverage increased from about 58% of children in 2016 to 71% in 2021 (Singh et al., 2024). This expansion was accompanied by modest improvements in nutrition: the proportion of underweight children declined by roughly 5 percentage points over this period.
- **ICDS contribution to nutrition decline:** Analyses estimate that ICDS helped explain a small share of the national decline in underweight. Singh et al. (2024) attribute about 9–12% of the observed reduction in underweight to improvements in ICDS coverage and service delivery (Singh et al., 2024). Other factors, notably rises in maternal education, contributed a larger share of gains. For example, maternal education changes accounted for 13–30% of the underweight decline, versus 9–12% from ICDS. Thus, ICDS played a positive but partial role.
- **Dietary outcomes:** Children accessing ICDS services tended to have better diets in some respects. (Kumar et al., 2025) reported that ICDS beneficiaries aged 6–23 months had about 19% higher likelihood of meeting dietary diversity and were more likely to consume eggs or meat (odds ~1.27–1.35) than non-users (Kumar et al., 2025). This suggests the program's complementary feeding and education components may raise food variety. However, ICDS did not improve all metrics: those children were actually *less* likely to meet the minimum meal frequency or acceptable diet requirements (Kumar et al., 2025). In other words, while diversity and nutrient-rich foods improved, overall adequacy of feeding remained a problem for ICDS targets.
- **Coverage gaps for the neediest:** Despite these services, ICDS did not preferentially reach the most malnourished. (Chakraborty et al., 2024) found that ICDS coverage among SAM children was not higher than among other children—in some categories, it was lower (Chakraborty et al., 2024). Coverage was higher in rural areas and among younger children, but ICDS did not show the intended effect of targeting SAM cases. Improving maternal services (antenatal/postnatal) could raise ICDS uptake among malnourished young children (Chakraborty et al., 2024).
- **Regional disparities:** The effectiveness and reach of ICDS vary by state. NFHS-5 indicates states like Maharashtra and Gujarat still have over 10% SAM prevalence, while others (Odisha, Karnataka) have made larger gains. ICDS service coverage also differs: for example, Odisha reported ~92% ICDS

coverage among SAM children, whereas national average was lower (Chakraborty et al., 2024). These variations point to unequal program performance across regions.

Overall, the literature shows ICDS expansion coincided with modest nutrition gains nationally but also highlights persistent challenges in reaching and adequately feeding all vulnerable children.

## 7. Discussion

The review of the study suggests that ICDS has contributed positively to child nutrition in India, but its impact is modest compared to its potential. The finding that ICDS expansion accounted for about 10% of the decline in underweight (while education and wealth had larger roles) indicates that ICDS alone cannot eliminate malnutrition (Singh et al., 2024). In practice, ICDS provides vital calories and nutrition education, which helps improve dietary diversity among participants (Kumar et al., 2025). However, inadequate intake curtails gains; the lack of improvement in feeding frequency or minimum diet highlights this gap (Kumar et al., 2025). In other words, children using ICDS get more varied foods, but may still fall short on total meals or calories. This suggests that program quality (e.g. consistency and quantity of feeding) needs strengthening. Indeed, the authors of one study explicitly noted that “optimizing the quality of interventions under ICDS” could yield further reductions in undernutrition (Singh et al., 2024).

A key insight is that ICDS is not automatically reaching those who need it most. Coverage analyses show severe malnutrition cases are not being preferentially captured by the system (Chakraborty et al., 2024). This is perhaps a symptom of broader implementation issues. (Prasad, 2025) and others argue that the ICDS infrastructure and management are overstretched: centers often lack adequate facilities, food supplies are irregular, and Anganwadi workers are under-resourced (Prasad, 2025). Even when children attend, the supplementary rations (300 kcal for young children) may not be sufficient or may be shared within families (Sachdev & Dasgupta, 2001). Moreover, excessive centralization means local needs (e.g. cultural food preferences) may not be addressed, and community involvement is limited (Prasad, 2025). These systemic weaknesses likely dilute ICDS’s effectiveness.

Regional differences underscore the program’s uneven performance. States like Odisha and Chhattisgarh, which have more innovative approaches (e.g., community kitchens, better monitoring), achieved very high ICDS coverage among SAM children (Chakraborty et al., 2024). In contrast, poorer outcomes in some wealthier states (e.g., Maharashtra’s high SAM prevalence (Chakraborty et al., 2024) despite coverage) suggest implementation rather than resources drives success (Khadse & Shaikh, 2025). Strengthening training, supply chains, and accountability at the local level could help address this.

In summary, ICDS is making a measurable contribution to reducing malnutrition, but far from eradicating it. The mixed evidence – modest improvements in some studies versus null results in others – indicates that program inputs need to be translated into effective nutrition outcomes. Policy efforts, such as the 2018 POSHAN Abhiyaan reforms, have improved ICDS reach, but our review confirms that investing in **quality** is crucial. This means ensuring adequate food quality and quantity, improving Anganwadi capacity, and linking with health services (e.g., improving maternal nutrition) to break transmission of malnutrition (Gopalakrishnan et al., 2025; Paul et al., 2018).

## 8. Findings

- **ICDS Coverage Increased:** National ICDS service use grew significantly (58% to 71% of children) from 2016–2021 (Singh et al., 2024).
- **Nutrition Trends:** National underweight prevalence among under-fives fell modestly (about 5 per-

ntage points) in the same period. ICDS expansion accounted for around 9–12% of this decline (Singh et al., 2024).

- **Dietary Improvements:** ICDS participation was associated with higher dietary diversity and protein-rich foods among infants and young children (Kumar et al., 2025).
- **Persistent Gaps:** ICDS had no effect on minimum meal frequency or acceptable diet; many children on ICDS remained inadequately fed (Kumar et al., 2025). Coverage among severely malnourished children did not exceed that of other children (Chakraborty et al., 2024).
- **Quality Concerns:** Studies agree that ICDS's impact is limited by implementation issues (insufficient inputs, worker training and motivation, and logistical problems) (Prasad, 2025; Singh et al., 2024).
- **Regional Variation:** ICDS effectiveness varies widely by state, and better-performing states can offer insights for underperforming ones in reducing malnutrition (Leyvraz et al., 2016; Rajpal et al., 2020).

## 9. Conclusion

ICDS plays a positive role in India's fight against child malnutrition, but the systematic review reveals only modest success to date. Coverage of ICDS services has grown and correlates with some improvements in children's diets and weight, yet millions of children remain undernourished. The evidence indicates that ICDS alone, without broader socio-economic progress, cannot eliminate malnutrition. Crucially, the program's potential is hampered by chronic under-resourcing and organizational weaknesses. Our review underscores the need for renewed focus on enhancing ICDS quality: increasing nutrition supplementation beyond current norms, strengthening Anganwadi capacity, engaging communities, and improving targeting of the most vulnerable. Stronger monitoring of nutrition outcomes (not just inputs) and integration with health and education initiatives could amplify ICDS impact. Future research should continue evaluating ongoing reforms (like the POSHAN Abhiyaan) to identify which interventions best accelerate the decline in child malnutrition. By addressing these gaps, ICDS can better fulfil its promise as India's central nutrition safety net.

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