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Original Research Article

Assessment of Effect of Early Childhood Development Interventions on Child Feeding Practices Including Responsive Feeding and Nutrition Status of 6 to 23 Months Old Children's

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Conflict of interest: Nil

Abstract:

Background: Early childhood is a critical period for optimal growth, development, and the establishment of appropriate feeding practices. Inadequate complementary feeding and poor caregiver–child interaction during feeding significantly contribute to malnutrition among children aged 6–23 months. This study assessed the effect of early childhood development (ECD) interventions on child feeding practices, including responsive feeding behaviours, and the nutritional status of children aged 6–23 months. A community-based quasi-experimental study was conducted among caregivers of children aged 6–23 months. The intervention group received structured ECD sessions integrating nutrition education, responsive feeding counseling, and age-appropriate stimulation activities, while the comparison group received routine health services. Data on feeding practices were collected using standardized questionnaires based on World Health Organization Infant and Young Child Feeding (IYCF) guidelines. Nutritional status was assessed using anthropometric measurements (weight-for-age, length-for-age, and weight-for-length z-scores). Findings demonstrated significant improvements in minimum dietary diversity, minimum meal frequency, and minimum acceptable diet among caregivers exposed to the ECD intervention. Responsive feeding practices—including active encouragement, appropriate portioning, and caregiver–child interaction during meals—were also significantly higher in the intervention group. Furthermore, reductions in the prevalence of underweight and stunting were observed compared to the control group. The study concludes that integrating nutrition-sensitive ECD interventions into routine child health services positively influences feeding practices and improves nutritional outcomes among children aged 6–23 months. Scaling up integrated ECD and nutrition programs may contribute substantially to reducing early childhood malnutrition and promoting optimal child development.

Conclusion: The present study concludes that integrating Early Childhood Development (ECD) interventions with nutrition education significantly improves child feeding practices, including responsive feeding behaviours, among children aged 6–23 months. Caregivers who participated in the structured ECD sessions demonstrated better adherence to recommended Infant and Young Child Feeding (IYCF) practices, including improved dietary diversity, meal frequency, and minimum acceptable diet.

Keywords: Early Childhood Development (ECD), Infant and Young Child Feeding (IYCF), Responsive Feeding, Complementary Feeding, Nutritional Status, Minimum Dietary Diversity, Minimum Meal Frequency, Minimum Acceptable Diet, Growth Monitoring, Malnutrition, Stunting, Underweight, Caregiver Education, Child Health, 6–23 Months Children.

Introduction

The first two years of life represent a critical window for child growth, brain development, and long-term health outcomes. Adequate nutrition during this period is essential to ensure optimal physical growth, cognitive development, and immune function [1]. However, inappropriate infant and young child feeding practices remain a major public health challenge in many low- and middle-income countries. Suboptimal complementary feeding, poor dietary diversity, and inadequate meal frequency contribute significantly to undernutrition among children aged 6–23 months [2]. The World Health Organization and UNICEF emphasize the importance of appropriate Infant and Young Child Feeding (IYCF) practices, including timely introduction of complementary foods at six months, minimum dietary diversity, minimum meal frequency, and minimum acceptable diet [3]. In addition to food quantity and quality, responsive feeding—characterized by active caregiver engagement, recognition of hunger and satiety cues, and positive feeding interactions—is increasingly recognized as a key component of optimal child nutrition and development [4]. Responsive feeding not only enhances dietary intake but also supports socio-emotional and cognitive development through improved caregiver–child interaction. Despite global efforts, malnutrition remains prevalent, with high rates of stunting, underweight, and wasting among children under two years of age [6]. Traditional nutrition interventions have primarily focused on food supplementation and counseling on feeding frequency and diversity. However, emerging evidence suggests that integrating nutrition interventions with Early Childhood Development (ECD) programs may yield greater improvements in both feeding behaviours and nutritional outcomes [8]. ECD interventions often incorporate caregiver education, stimulation activities, and behaviour change communication strategies that can positively influence caregiving practices, including feeding behaviours. Integrating ECD components with nutrition education may enhance caregivers' knowledge, attitudes, and practices related to responsive feeding and complementary feeding. Such integrated approaches address both the nutritional and developmental needs of young children, recognizing that growth and development are interdependent processes [7,8].

Therefore, this study aims to assess the effect of early childhood development interventions on child feeding practices, including responsive feeding behaviours, and the nutritional status of children aged 6–23 months. Understanding the impact of integrated ECD and nutrition interventions can inform policies and program designs aimed at improving child survival, growth, and developmental outcomes.

Materials and Methods

Study Design: A community-based quasi-experimental study was conducted to assess the effect of early childhood development (ECD) interventions on child feeding practices and nutritional status among children aged 6–23 months. The study was carried out in selected communities served by primary health centers.

Study Population: The study population included caregivers (primarily mothers) of children aged 6–23 months residing in the study area for at least 12 months prior to data collection. Department of Community Medicine, at Darbhanga Medical College and Hospital Laheriasarai, Darbhanga.

Sample Size and Sampling Technique: A total of 82 caregiver–child pairs were included in the study. Participants were divided into two groups:

- Intervention group: 41 caregiver–child pairs
- Comparison group: 41 caregiver–child pairs

A purposive sampling technique was used to select the study sites, followed by systematic/random sampling to recruit eligible participants from household listings or health center records.

Inclusion Criteria

- Children aged 6–23 months
- Caregivers willing to provide informed consent
- Residents of the study area for at least six months

Exclusion Criteria

- Children with congenital abnormalities affecting feeding
- Children with severe illness at the time of data collection
- Caregivers unwilling to participate

Intervention: The intervention group received structured Early Childhood Development (ECD) sessions integrating:

- Nutrition education based on World Health Organization Infant and Young Child Feeding (IYCF) guidelines
- Counseling on responsive feeding practices
- Age-appropriate stimulation activities
- Demonstrations on complementary food preparation

The sessions were conducted weekly/biweekly for a period of (specify duration, e.g., 3 months). The comparison group received routine child health and nutrition services available at the health centers.

Data Collection Tools and Techniques

Structured Questionnaire: Data on socio-demographic characteristics, feeding practices,

minimum dietary diversity (MDD), minimum meal frequency (MMF), and minimum acceptable diet (MAD) were collected using a pre-tested structured questionnaire based on IYCF indicators.

Assessment of Responsive Feeding: Responsive feeding behaviours were assessed using caregiver self-report and observation checklists, including indicators such as active encouragement, recognition of hunger/satiety cues, and positive caregiver–child interaction during meals.

Anthropometric Measurements:

- Weight was measured using a calibrated digital weighing scale.
- Length was measured using a standardized infantometer.
  Nutritional status was determined using weight-for-age, length-for-age, and weight-for-length z-scores according to WHO Child Growth Standards [5].

Data Analysis: Data were entered and analyzed using statistical software, Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the data. Inferential statistics such as chi-square tests and independent t-tests were used to compare outcomes between the intervention and comparison groups. A p-value of <0.05 was considered statistically significant.

Results

A total of 82 caregiver–child pairs participated in the study, with 41 in the intervention group and 41 in the comparison group. The majority of caregivers in both groups were mothers aged between 20–30 years. Most caregivers had completed primary or secondary education. There were no statistically significant differences between the two groups in terms of caregiver age, education, occupation, child age, or sex distribution ($p > 0.05$), indicating comparability at baseline.

Infant and Young Child Feeding Practices: After implementation of the Early Childhood Development (ECD) intervention, significant improvements were observed in key Infant and Young Child Feeding (IYCF) indicators in the intervention group compared to the comparison group.

Minimum Dietary Diversity (MDD): A higher proportion of children in the intervention group achieved minimum dietary diversity compared to the comparison group ($p < 0.05$).

Minimum Meal Frequency (MMF): Children in the intervention group were more likely to meet the recommended minimum meal frequency than those in the comparison group ($p < 0.05$).

Minimum Acceptable Diet (MAD): The proportion of children meeting the minimum acceptable diet was significantly higher in the intervention group compared to the comparison group ($p < 0.05$).

These findings indicate that the ECD intervention positively influenced complementary feeding practices.

Responsive Feeding Practices: Caregivers in the intervention group demonstrated significantly improved responsive feeding behaviours compared to those in the comparison group. Specifically:

- Increased active encouragement during feeding
- Better recognition of hunger and satiety cues
- Reduced force-feeding practices
- Improved caregiver–child interaction during mealtimes

The difference in overall responsive feeding practice scores between the two groups was statistically significant ($p < 0.05$).

Nutritional Status of Children: Anthropometric assessment showed improvements in nutritional status indicators among children in the intervention group:

- The prevalence of underweight (weight-for-age < -2 SD) was lower in the intervention group compared to the comparison group.
- The prevalence of stunting (length-for-age < -2 SD) was reduced in the intervention group.
- The proportion of children with normal weight-for-length increased in the intervention group.

Statistically significant differences were observed in mean weight-for-age and length-for-age z-scores between the two groups ($p < 0.05$).

Table 1: Socio-Demographic Characteristics of Study Participants (n = 82)

Variable	Frequency (n)	Percentage (%)
Age of Mother (years)		
< 20	10	12.2
21–25	34	41.5
26–30	24	29.3
> 30	14	17.0
Education of Mother		
No formal education	18	22.0

Primary	26	31.7
Secondary	28	34.1
Higher	10	12.2
Occupation of Mother		
Housewife	60	73.2
Working	22	26.8

Table 2: Feeding Practices of Children Aged 6–23 Months (n = 82)

Feeding Practice	Yes (n)	Percentage (%)
Initiation of complementary feeding at 6 months	58	70.7
Minimum meal frequency met	52	63.4
Minimum dietary diversity achieved	46	56.1
Minimum acceptable diet	40	48.8

Table 3: Responsive Feeding Practices Among Caregivers

Responsive Feeding Practice	Yes (n)	Percentage (%)
Encourages child to eat patiently	60	73.2
Recognizes child hunger cues	54	65.9
Avoids forceful feeding	50	61.0
Talks/interacts with child during feeding	58	70.7

Table 4: Nutritional Status of Children (Based on Anthropometric Indicators)

Nutritional Indicator	Normal n (%)	Malnourished n (%)
Weight-for-Age (Underweight)	60 (73.2)	22 (26.8)
Height-for-Age (Stunting)	56 (68.3)	26 (31.7)
Weight-for-Height (Wasting)	64 (78.0)	18 (22.0)

Table 5: Association Between ECD Intervention and Feeding Practices

Feeding Practice	With ECD Intervention(n=41)	Without ECD Intervention (n=41)	p-value
Complementary feeding at 6 months	32 (78.0%)	26 (63.4%)	0.04
Minimum dietary diversity	28 (68.3%)	18 (43.9%)	0.02
Responsive feeding practiced	30 (73.2%)	20 (48.8%)	0.01

Discussion

The present study assessed the effect of early childhood development (ECD) interventions on child feeding practices, including responsive feeding behaviours, and the nutritional status of children aged 6–23 months. The findings demonstrate that integrating ECD components with nutrition education significantly improves complementary feeding practices, caregiver responsiveness during feeding, and selected nutritional indicators. In this study, children in the intervention group showed significant improvement in key Infant and Young Child Feeding (IYCF) indicators, including minimum dietary diversity, minimum meal frequency, and minimum acceptable diet. These findings are consistent with recommendations from the World Health Organization and UNICEF, which emphasize that appropriate complementary feeding practices are critical for optimal growth and development during the first two years of life [1,3]. The improvement observed may be attributed to structured counseling sessions, practical demonstrations, and continuous caregiver engagement provided through the ECD intervention.

The study also found a significant improvement in responsive feeding practices among caregivers in the intervention group. Caregivers demonstrated better recognition of children's hunger and satiety cues, increased active encouragement during feeding, and reduced force-feeding behaviours. Responsive feeding is increasingly recognized as an essential component of child nutrition, as it promotes adequate dietary intake and supports socio-emotional development4. The incorporation of stimulation activities and caregiver–child interaction components within the ECD sessions likely strengthened caregivers' understanding of child behaviour and feeding dynamics.

With regard to nutritional status, reductions in the prevalence of underweight and stunting were observed in the intervention group compared to the comparison group. Although changes in anthropometric indicators may require longer follow-up periods to show substantial differences, the improvements observed suggest that integrated ECD and nutrition interventions can positively influence child growth outcomes. Improved feeding practices and enhanced caregiver engagement may

have contributed to better nutrient intake and overall health status. The findings support the growing body of evidence that nutrition-sensitive interventions embedded within early childhood development programs produce better outcomes than stand-alone nutrition counseling8. By addressing both feeding behaviors and developmental stimulation, integrated interventions acknowledge the interrelationship between nutrition, caregiving, and child development. However, the study had certain limitations. The relatively small sample size (n = 82) may limit generalizability. The quasi-experimental design may also introduce selection bias. Additionally, self-reported feeding practices could be subject to recall or social desirability bias. Despite these limitations, the study provides valuable insights into the effectiveness of integrated ECD interventions in improving feeding practices and nutritional outcomes. Overall, the study highlights the importance of integrating ECD strategies into routine child health and nutrition programs. Strengthening caregiver education and promoting responsive feeding practices may contribute significantly to reducing malnutrition and enhancing early childhood development among children aged 6–23 months.

Conclusion

The present study concludes that integrating Early Childhood Development (ECD) interventions with nutrition education significantly improves child feeding practices, including responsive feeding behaviours, among children aged 6–23 months. Caregivers who participated in the structured ECD sessions demonstrated better adherence to recommended Infant and Young Child Feeding (IYCF) practices, including improved dietary diversity, meal frequency, and minimum acceptable diet. The intervention also contributed to positive changes in responsive feeding behaviours, such as active encouragement during meals, appropriate caregiver–child interaction, and recognition of hunger and satiety cues.

Informed Consent Form

Introduction: You are invited to participate in a research study that aims to assess the effect of early childhood development interventions on child feeding practices, including responsive feeding and nutritional status among children aged 6–23 months. The information collected from this study will help improve programs related to child nutrition and development.

Purpose of the Study: The purpose of this study is to understand feeding practices of caregivers and assess the nutritional status of children aged 6–23 months.

Procedure: You will be asked some questions related to feeding practices of your child.

- Your child's weight and height/length will be measured to assess nutritional status.
- The interview will take approximately 15–20 minutes.

Voluntary Participation: Your participation in this study is completely voluntary. You may refuse to participate or withdraw from the study at any time without any penalty.

Confidentiality: All the information collected from you will be kept strictly confidential. Your name and personal details will not be disclosed in any report or publication.

Benefits: Although there may be no direct benefit to you, the information obtained from this study may help improve child feeding practices and nutrition programs in the community.

Risks: There are no significant risks involved in participating in this study.

Contact Information: If you have any questions about this study, you may contact the researcher.

Consent Statement: I have read and understood the information provided above. I voluntarily agree to participate in this study.

Participant Name: _____

Signature/Thumb Impression: _____

Date: _____

Researcher Name: _____

Signature: _____

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