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Original Article

Comparative Effects of Baby-Led Weaning and Traditional Complementary Feeding on Growth, Dietary Diversity, Feeding Behaviours, and Feeding-Related Motor Milestones in Children Aged 6–36 Months: A Cross-Sectional Study

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ABSTRACT

Background: Complementary feeding influences growth and later eating behaviour. Baby-led weaning (BLW) promotes infant self-feeding, while traditional complementary feeding (TCF) is caregiver-led.

Objectives: To compare BLW and TCF for growth indices, diet diversity, feeding-related risks/behaviours, and feeding-skill milestones in children aged 6–36 months.

Methods: In this 6-month cross-sectional study at a paediatric unit in Amalapuram, India, 100 children were enrolled (BLW=50; TCF=50). Caregivers completed a structured questionnaire. Weight and length/height were measured, and WHO Anthro generated Z-scores. Groups were compared using χ^2 and independent t-tests ($p<0.05$).

Results: BLW had higher weight-for-age (−0.2±1.1 vs −0.5±1.3; p=0.04) and BMI-for-age Z-scores (0.1±1.0 vs −0.3±1.1; p=0.03). Dietary diversity was higher with BLW (5.6±1.2 vs 4.3±1.5; p=0.001) and early snacks/sweets were less frequent (18% vs 36%; p=0.01). Exclusive breastfeeding ≥6 months was higher in BLW (75% vs 55%; p=0.01). Reported choking did not differ (10% vs 6%; p=0.47). Picky eating (18% vs 32%; p=0.04) and caregiver anxiety (24% vs 42%; p=0.03) were lower, and feeding-skill milestones were earlier ($p<0.01$).

Conclusions: BLW was associated with better weight indices and more diverse diets, without a statistically higher reported choking rate.

Keywords*: baby-led weaning; complementary feeding; dietary diversity; choking; infant growth.*

INTRODUCTION

Complementary feeding, defined as the introduction of foods and liquids alongside continued breastfeeding or formula feeding, represents a critical window for optimal child growth and development[1]. From 6 to 23 months, children transition from milk-dominant diets to family foods, while growth velocity and micronutrient needs remain high. Diet quality during this period influences energy balance, iron intake, and early learning of flavours and textures. Inappropriate timing, low dietary diversity, and early reliance on sweetened snacks or energy-dense foods can displace nutrient-rich options and compromise feeding quality [1,2].

Conventional complementary feeding often begins with smooth purées offered by spoon and progresses gradually to thicker textures and finger foods. In this caregiver-led model, adults typically control pace and portion size. Baby-led weaning (BLW) is an alternative approach in which infants self-feed appropriately prepared finger foods from the start of complementary feeding, deciding the pace and the amount eaten from foods offered by the caregiver [2]. BLW is often

positioned as an extension of responsive feeding, aiming to support hunger–satiety recognition, reduce pressure feeding, and encourage early engagement with varied textures [3].

The evidence base for BLW is still evolving. Reviews highlight possible advantages in food variety and mealtime experience, but also emphasize uncertainties about choking risk and dietary adequacy—particularly iron—when caregivers lack counselling on safe food forms and balanced meal composition [4,5]. Observational studies have reported differences in foods offered and eating behaviours between BLW and traditional approaches, including higher exposure to family foods and lower exposure to snacks/sweets in some cohorts [6]. Feeding approach may also influence self-regulation and later weight trajectories, as well as opportunities for fine motor practice during grasping, hand-to-mouth coordination, and utensil exploration. At the same time, caregivers choosing BLW often differ in education and breastfeeding practices, raising the possibility of confounding [13]. Randomized studies of modified BLW approaches suggest that structured parent education can mitigate choking concerns while supporting appropriate growth [7,8].

In India, complementary feeding practices are heterogeneous and shaped by cultural food patterns, household support, and access to counselling. BLW is increasingly discussed among urban families, yet Indian comparative data remain limited. This study therefore compared BLW and traditional complementary feeding (TCF) among children aged 6–36 months in a tertiary-care paediatric setting, focusing on growth indices, dietary patterns and diversity, feeding-related risks and behaviours, and feeding-skill milestones.

METHODOLOGY

Study design and setting: This cross-sectional observational study was conducted over 6 months in the Department of Pediatrics at KIMS & RF, Amalapuram, Andhra Pradesh, India.

Participants: Children aged 6–36 months attending paediatric services with a caregiver who could provide feeding history were eligible. Children with major congenital anomalies, chronic systemic illness, known neurodevelopmental disorders affecting feeding, or acute conditions that precluded reliable dietary assessment were excluded. Written informed consent was obtained from caregivers, and the Institutional Ethics Committee approved the study.

Sample size and recruitment: A total sample of 100 (50 per group) was targeted based on feasible recruitment within the study period and prior similar observational comparisons. Consecutive eligible children were approached until the required numbers were achieved.

Group classification: Children were assigned to the BLW or TCF group based on caregiver responses to a structured, pre-validated questionnaire. BLW was defined as a predominant self-feeding approach with finger foods from the start of complementary feeding, with minimal spoon-feeding. TCF was defined as predominantly caregiver spoon-feeding of purées/mashed foods, with a gradual introduction of finger foods.

Data collection: Caregivers were interviewed for demographics (age, sex, residence, parental education), feeding history (age at complementary feeding initiation, exclusive breastfeeding duration), and feeding-related concerns. Anthropometry was measured by trained staff using calibrated instruments: weight to the nearest 0.1 kg on a scale, and recumbent length or standing height to the nearest 0.1 cm using an infantometer or stadiometer. WHO Anthro software was used to compute weight-for-age, height-for-age, and BMI-for-age Z-scores based on WHO Child Growth Standards.

Dietary indicators: Dietary intake was assessed by caregiver report of usual patterns, including daily fruit and vegetable intake, early introduction of snacks/sweets, and a dietary diversity score (DDS) reflecting the number of major food groups consumed; higher DDS indicated greater dietary variety. Feeding-related risks/behaviours included reported choking episodes, picky eating, and caregiver anxiety during feeding.

Motor milestones: Feeding-skill milestones (self-feeding with hand and independent spoon use) were obtained from caregiver report and the child's health record when available.

Statistical analysis: Data were entered in Microsoft Excel and analysed using SPSS version 25. Categorical variables were compared with the chi-square test and continuous variables with the independent t-test. Data were checked for completeness a two-sided p value <0.05 was considered statistically significant.

RESULTS

Participants: The study included 100 children aged 6–36 months (BLW=50; TCF=50). Mean age was comparable between groups (19.5±7.2 vs 20.1±7.8 months; p=0.67) and sex distribution did not differ (male: 54% vs 48%; p=0.54). BLW was more common among urban families (62% vs 46%), and both maternal and paternal graduation-level education were higher in the BLW group (68% vs 42% and 70% vs 46%, respectively). Baseline demographic and socioeconomic characteristics are summarized in Table 1.

Table 1. Demographic and socioeconomic profile (n = 100)

Variable	BLW (n=50)	TCF (n=50)	p-value
Age (months), mean ± SD	19.5 ± 7.2	20.1 ± 7.8	0.67
Male sex, n (%)	27 (54.0)	24 (48.0)	0.54
Residence: Urban, n (%)	31 (62.0)	23 (46.0)	0.09
Residence: Rural, n (%)	19 (38.0)	27 (54.0)	0.09
Maternal education: Graduate or above, n (%)	34 (68.0)	21 (42.0)	0.01
Maternal education: Up to high school, n (%)	16 (32.0)	29 (58.0)	0.01
Paternal education: Graduate or above, n (%)	35 (70.0)	23 (46.0)	0.02
Paternal education: Up to high school, n (%)	15 (30.0)	27 (54.0)	0.02

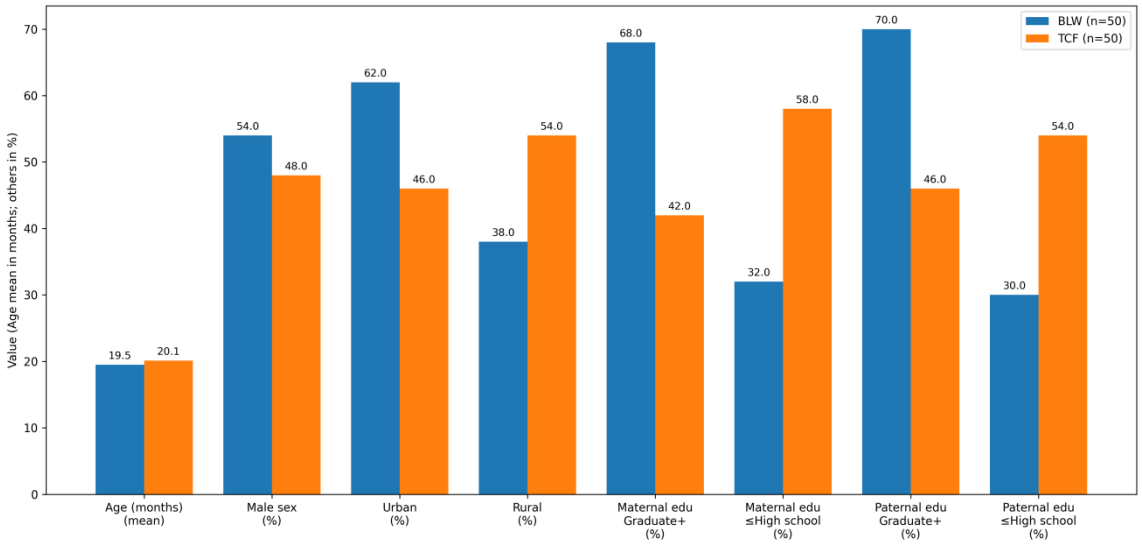

Figure 1: Demographic and socioeconomic profile

Anthropometry: BLW children had higher mean weight-for-age Z-scores (−0.2±1.1 vs −0.5±1.3; p=0.04) and BMI-for-age Z-scores (0.1±1.0 vs −0.3±1.1; p=0.03). Height-for-age Z-scores were also higher in BLW but the difference was not statistically significant (−0.3±1.2 vs −0.6±1.4; p=0.06). Group-wise anthropometric indices are presented in Table 2.

Table 2. Anthropometric indices (WHO Z-scores)

Variable	BLW (n=50)	TCF (n=50)	p-value
Weight-for-age Z, mean ± SD	−0.2 ± 1.1	−0.5 ± 1.3	0.04
Height-for-age Z, mean ± SD	−0.3 ± 1.2	−0.6 ± 1.4	0.06
BMI-for-age Z, mean ± SD	0.1 ± 1.0	−0.3 ± 1.1	0.03

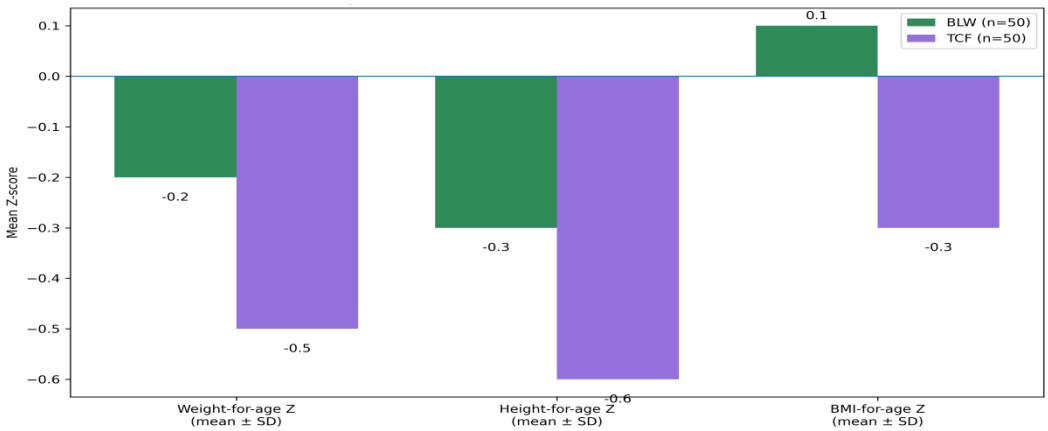

Figure 2: Anthropometric indices (WHO Z-scores): BLW vs TCF

Feeding practices and diet quality: Exclusive breastfeeding for ≥6 months was more frequent in the BLW group (75% vs 55%; p=0.01). Daily fruit and vegetable consumption were higher in BLW (82% vs 64%; p=0.02 and 76% vs 58%; p=0.03). Early introduction of snacks/sweets was lower with BLW (18% vs 36%; p=0.01). Mean dietary diversity score was higher in BLW (5.6±1.2 vs 4.3±1.5; p=0.001). Feeding practices and diet-quality indicators are detailed in Table 3.

Table 3. Feeding practices and diet quality

Variable	BLW (n=50)	TCF (n=50)	p-value
Exclusive breastfeeding ≥6 months, n (%)	38 (75.0)	28 (55.0)	0.01
Solids introduced at 6 months, n (%)	32 (64.0)	29 (58.0)	0.54
Daily fruit intake, n (%)	41 (82.0)	32 (64.0)	0.02
Daily vegetable intake, n (%)	38 (76.0)	29 (58.0)	0.03
Early snacks/sweets introduced, n (%)	9 (18.0)	18 (36.0)	0.01
Dietary diversity score, mean ± SD	5.6 ± 1.2	4.3 ± 1.5	0.001

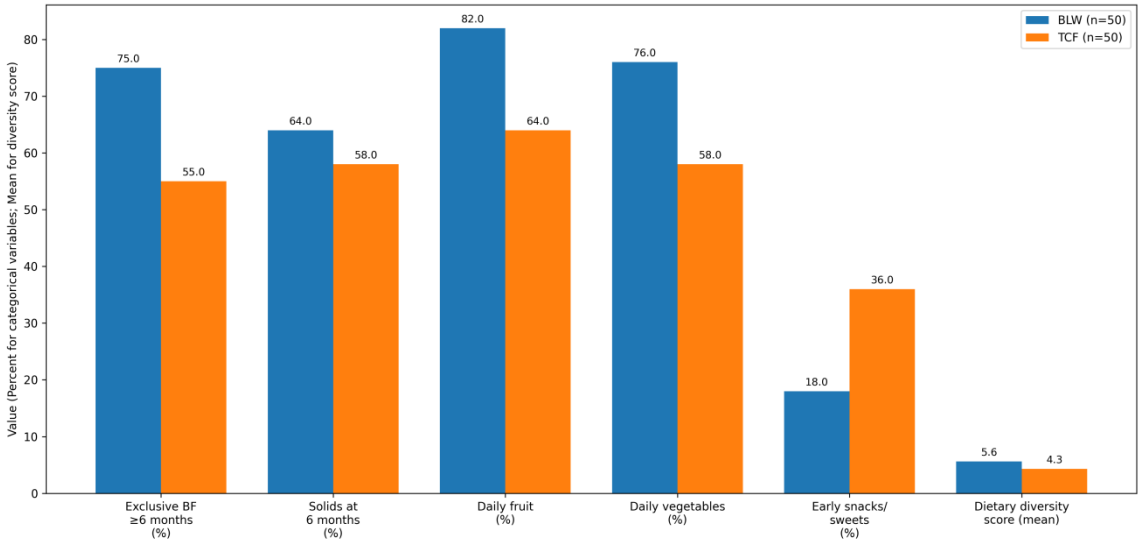

Figure 3: Feeding practices and diet quality

Feeding-related risks, behaviours, and milestones: Reported choking episodes did not differ significantly (10% vs 6%; p=0.47). Picky eating (18% vs 32%; p=0.04) and caregiver anxiety during feeding (24% vs 42%; p=0.03) were lower in BLW. Feeding-skill milestones occurred earlier in BLW, including self-feeding with the hand (8.4±1.3 vs 10.1±1.5 months; p<0.01) and independent spoon use (14.2±2.1 vs 16.3±2.4 months; p<0.01). Feeding-related risks and behaviours are shown in Table 4, and feeding-skill milestones are summarized in Table 5.

Table 4. Feeding-related risks and behaviours

Variable	BLW (n=50)	TCF (n=50)	p-value
Reported choking episode(s), n (%)	5 (10.0)	3 (6.0)	0.47
Picky eating, n (%)	9 (18.0)	16 (32.0)	0.04
Caregiver anxiety during feeding, n (%)	12 (24.0)	21 (42.0)	0.03

Table 5. Feeding-skill milestones (months)

Variable	BLW (n=50)	TCF (n=50)	p-value
Self-feeding with hand, mean ± SD	8.4 ± 1.3	10.1 ± 1.5	<0.01
Independent spoon use, mean ± SD	14.2 ± 2.1	16.3 ± 2.4	<0.01

DISCUSSION

In this cross-sectional study, children following BLW showed more favourable weight-for-age and BMI-for-age Z-scores, higher dietary diversity, and healthier feeding patterns than those following traditional spoon-led feeding. Caregiver-reported choking did not differ significantly between groups, while picky eating and caregiver anxiety were lower and feeding-skill milestones occurred earlier in the BLW group.

The dietary findings mirror prior work suggesting BLW families may offer a broader range of foods and fewer snack items because infants join family meals and encounter varied textures and flavours [6,11,12]. Higher dietary diversity is clinically relevant where micronutrient gaps are common; however, BLW requires deliberate inclusion of iron-rich and energy-dense options, a recurring concern in reviews and in trials of modified BLW (BLISS) designed to improve iron intake [4,7,9,10].

The absence of a statistically higher choking rate aligns with randomized evidence that, when safe food forms are used and caregivers are counselled, choking incidence is comparable between BLW-style and traditional feeding [8]. Nonetheless, choking was measured by caregiver recall rather than prospective observation, so counselling on supervision, posture, and appropriate textures remains essential.

Lower picky eating and anxiety may reflect reduced pressure feeding and greater child autonomy, which are linked to responsive feeding interactions [13,14]. Earlier self-feeding milestones are plausible because BLW provides repeated opportunities for grasping, hand-to-mouth coordination, and utensil exploration [15].

Interpretation should be cautious because BLW was more common among urban and more educated families in this sample, factors that can influence diet quality. Even so, the overall pattern suggests BLW principles may be beneficial when paired with practical guidance on nutrient adequacy and choking prevention. Given the observational design, these associations are not causal and should be tested in prospective cohorts.

Limitations

This study has limitations. Its cross-sectional design precludes causal inference. Feeding approach, choking, and dietary indicators were caregiver-reported and may be affected by recall or social desirability bias; gagging was not distinguished from true choking. The sample came from a single tertiary-care centre and was recruited by feasibility, limiting generalizability. Residual confounding is likely because BLW families had higher urban residence and education. Direct micronutrient intake and biochemical measures were not assessed. Selection bias may influence results.

CONCLUSION

Among children aged 6–36 months in this tertiary-care setting, baby-led weaning was associated with higher weight-for-age and BMI-for-age Z-scores and a more diverse diet than traditional complementary feeding. The baby-led group reported higher fruit and vegetable intake, less early introduction of snacks/sweets, and longer exclusive breastfeeding. Feeding experiences were more positive, with lower caregiver anxiety and fewer picky-eating behaviours. Caregiver-reported choking episodes were similar between groups, and feeding-skill milestones were achieved earlier with baby-led weaning. When families are counselled on iron-rich foods and choking prevention, baby-led principles can be safely integrated into routine guidance.

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