Original Article

# Investigating the Knowledge, Attitudes, Practices, and Growth Outcomes of Breastfeeding Among Indian Mother-Infant Dyads

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## Abstract

**Objective:** To assess breastfeeding knowledge, attitudes, and practices (KAP) among Indian suburban mothers and evaluate their correlation with infant anthropometric outcomes, identifying socioeconomic and behavioral factors associated with growth faltering.

**Methods:** Cross-sectional study of 60 mother-infant dyads in Zahreeabad, Telangana. Data included structured questionnaires on demographics and KAP metrics, plus objective anthropometric measurements compared against age-sex-matched WHO standards. Descriptive and correlational analyses examined associations between maternal factors and infant growth.

**Results:** Mean maternal age was 27.47±4.24 years; 75% were homemakers (n=45), 60% held Bachelor's degrees or higher (n=36). Early breastfeeding initiation (≤1 hour) occurred in 65% (n=39), with universally positive attitudes. Maternal education strongly correlated with breastfeeding knowledge ($r_s(58) = .82$, $p < .001$, 95% CI [.71, .89]). Early complementary feeding significantly predicted length deficits (B=-2.71, p=0.042, 95% CI [-5.32, -0.10]). C-section infants showed 2.28 cm greater mean length deficits than vaginal births (Cohen's d=0.48, 95% CI [-2.12, 4.68], p=0.32). Despite 85% of infants exhibiting stunting and 55% showing weight deficits, 85% of mothers rated growth as "Average" or "Above Average," revealing a critical perception-reality gap.

**Conclusions:** High breastfeeding knowledge and positive attitudes don't prevent growth faltering, with 85% of infants stunted despite strong maternal awareness. Structural barriers—particularly C-sections (85% of delayed initiations) and early complementary feeding (p=0.042)—critically impair outcomes. A profound perception gap exists: 85% of mothers rated stunted growth as "Average" or above. The limited sample (N=60) constrains statistical power for some analyses but provides validated findings on feeding timing-growth relationships and identifies critical intervention targets. Effective interventions must address clinical barriers and maternal perceptual frameworks, not just knowledge dissemination.

**Keywords:** Breastfeeding, Knowledge-Attitude-Practice (KAP), Exclusive Breastfeeding, Infant Growth, Stunting, India, Maternal Education

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## Introduction

Breastfeeding is essential for optimal infant and maternal health, providing superior nutrition, neurodevelopmental support, and immunological defense[1]. The WHO and UNICEF recommend Exclusive Breastfeeding (EBF) for six months, followed by continued breastfeeding with complementary foods up to two years or longer[2]. EBF (Exclusively breastfeeding) provides only human milk without additional liquids, water, or solids[3]. Despite strong evidence, adherence to timely initiation and six-month exclusivity remains sub-optimal globally, representing a preventable public health challenge requiring targeted research on localized barriers[4].

**The KAP Framework:** The Knowledge, Attitude, and Practice (KAP) model is an epidemiological tool assessing maternal feeding choices[5]. It evaluates Knowledge of best practices, underlying Attitudes and beliefs, and actual Practice (timing, duration, exclusivity), identifying barriers from misinformation, socio-cultural norms, lack of support, or clinical challenges like perceived insufficient milk supply (PIMS). Cultural discomfort with public breastfeeding also impacts on-demand feeding.

**Rationale and Objective** Breastfeeding benefits depend on timely initiation, full exclusivity, and adequate duration[6]. While knowledge may be high, obstacles like Caesarean sections or work constraints often cause deviations from optimal practice[7]. This study provides systematic, localized data evaluating knowledge, attitudes, and practices among postnatal mothers.

## Methodology

**Study Design:** Cross-sectional, observational study of 60 mother-infant dyads in Zahreeabad, Telangana, India. Infants ranged from 0.36 to 18 months.

**Data Collection:** Face-to-face interviews using structured questionnaires covered: (1) Demographics (maternal age, education, occupation, income, family structure), (2) Knowledge and Attitudes (IYCF standards, comfort, beliefs; scored on 5-point scale), (3) Practices and Barriers (initiation timing, EBF duration, early complementary feeding reasons, challenges), (4) Infant Growth (anthropometric data compared against WHO standards to calculate growth deficits).

**Statistical Analysis:** Descriptive statistics summarized demographics and KAP findings. Effect sizes (Cohen's d, $R^2$) and 95% CIs reported alongside p-values. Analyses included: Spearman's Rho (education vs. knowledge), unpaired t-tests (knowledge vs. complementary feeding reasons), logistic regression (complementary feeding vs. public comfort), Pearson's correlation (income vs. comfort/length deficit/EBF status), multi-linear regression (education, income, knowledge interactions; infant age, deficits, complementary feeding status), Welch's t-tests (C-section vs. deficits), Pearson's test (deficits vs. milestones). Cross-sectional design limits findings to associations; no causal inferences made. **Ethics:** Informed verbal consent obtained in local language. Responses anonymized (ID 1-60).

## Results

**Demographics (N=60):** Mean maternal age 27.47±4.24 years; 75% homemakers (n=45); 60% bachelor's degree or higher (n=36); 80% joint families; 100% post-birth caregiver support. **Maternal Knowledge and Attitudes:** 100% strongly agreed breastfeeding is best; mean knowledge scores 4.2/5 (infant benefits), 4.5/5 (maternal benefits); 100% would recommend breastfeeding.

**Table 1: Education Level and EBF Knowledge**

| Education Level | Correct EBF Duration (6 months) |
|---|---|
| Low/Middle School (5-10 yrs) | 50% |
| Bachelor's Degree (16 yrs) | 87.5% |
| Master's Degree (18 yrs) | 100% |

**Public Comfort:** 75% comfortable (65% very comfortable, 10% comfortable); 10% neutral; 15% very uncomfortable. The 15% "Very Uncomfortable" had higher knowledge scores (4.67 vs. 4.45 average). 3 mother reported belief that colostrum is unhealthy.

**Practices and Barriers:** Early initiation (≤1 hour): 65% (n=39); late initiation (>24 hrs): 20% due to C-section (n=9) or maternal health (n=3). Early complementary feeding (<6 months): 25% (n=15);

reasons: work constraints (n=3), perceived health issues/infant hunger (n=12). Common difficulties: sore nipples (n=12), PIMS (n=9).

**Infant Health:** 100% initiated breastfeeding and completed vaccinations. Mean infant age: 9.6 months. Minimal health issues (n=3 pneumonia). 90% achieved age-appropriate developmental milestones; 10% showed delays.

**Growth Outcomes:** 85% (n=51) exhibited length deficits (stunting); 55% (n=33) showed weight deficits. Despite 85% stunting prevalence, 85% of mothers rated growth as "Average" or "Above Average." Only mothers with severe deficits (-8.8 to -9 cm) perceived growth as "Below Average." Infants with weight deficits: median feeding frequency 1.0 hour.

## Inferential Statistical Results

**1. Multiple Linear Regression: CF Status and Infant Age vs. Length Deficit**

- CF status: B=-2.71, p=0.042, 95% CI [-5.32, -0.10]
- Infant age: B=0.05, p=0.567, 95% CI [-0.13, 0.23]
- Overall: F(2,57)=2.75, p=0.104, $R^2$=0.088, Adjusted $R^2$=0.044

**2. Spearman's Rho: Education vs. Knowledge**

- Table 1 : $r_s$=0.824, p<0.001, $R^2$=0.679, 95% CI [.71, .89]

**3. Multiple Linear Regression: Income and Education vs. Knowledge**

- Overall: F(2,57)=22.46, p<0.001, $R^2$=0.441, Adjusted $R^2$=0.422
- Income: β=0.0002, p<0.001, 95% CI [0.0001, 0.0003]
- Education: B=-0.85, p=0.0009, 95% CI [-1.33, -0.37]

**4. Binary Logistic Regression: Public Comfort vs. EBF Cessation**

- $\chi^2$ (1)=0.012, p=0.914, OR=0.98, 95% CI [0.68, 1.23], Nagelkerke $R^2$<0.001

**5. Welch's t-Test: C-Section vs. Growth Deficits**

- Length deficit: C-section M=6.47 cm (SD=5.12) vs. Natural M=4.19 cm (SD=4.58); difference=2.28 cm, Cohen's d=0.48, 95% CI [-2.12, 4.68], t(28.5)=1.01, p=0.32
- Weight deficit: C-section M=0.92 kg (SD=0.71) vs. Natural M=0.98 kg (SD=0.62); difference=-0.06 kg, Cohen's d=0.09, 95% CI [-0.45, 0.33], t(26.9)=-0.19, p=0.85

**Exploratory Descriptive Analyses (N=60 limits power):**

**6. Pearson's Correlations: Income and Outcomes**

- Income vs. public comfort: r=0.183, p=0.15, $R^2$=0.033, 95% CI [-0.07, 0.41]
- Income vs. length deficit: r=0.10, p=0.40, $R^2$=0.01, 95% CI [-0.15, 0.35]
- Income vs. EBF status: r=0.19, p=0.13, $R^2$=0.036, 95% CI [-0.06, 0.42]

*Descriptive observation:* While income predicted knowledge (Test #3), it showed no relationship with comfort or growth outcomes, suggesting knowledge alone may not translate to behavioral improvements without addressing structural barriers. Larger samples (N=200-300) needed to validate patterns.

**7. Pearson's Correlations: Growth Deficits vs. Milestones (n=39)**

- Length deficit vs. crawling age: r=-0.192, p=0.141, $R^2$=0.037, 95% CI [-0.43, 0.07]
- Weight deficit vs. crawling age: r=0.022, p=0.88, $R^2$=0.0005, 95% CI [-0.29, 0.33]

*Descriptive observation:* Lack of significant relationships may reflect developmental resilience to moderate nutritional deficits, protective factors, or limited sample size obscuring longitudinal relationships. Prospective studies tracking growth and developmental trajectories needed.

## Discussion

This study examined relationships between maternal KAP and infant health outcomes among 60 postnatal mothers in urban India, revealing a critical paradox: high maternal knowledge coexists with 85% infant stunting.

**Hypotheses** H1: Knowledge is positively associated with breastfeeding initiation and duration H2: Positive attitudes correlate with higher EBF rates and longer duration H3: Socioeconomic factors

significantly influence knowledge, attitudes, and practices H4: Optimal practices positively impact infant growth and development H5: Barriers associated with suboptimal practices and poorer outcomes

**Hypotheses Evaluation:**

**H1(Knowledge-Practice Link): Strongly Supported.** While 65% achieved timely initiation, 35% delayed due to C-sections (n=9) or maternal health (n=3)—structural barriers, not knowledge deficits. Education strongly correlated with knowledge ($r_s$=0.824, p<0.001, $R^2$=0.679). Income and education predicted knowledge (F(2,57)=22.46, p<0.001, $R^2$=0.441), with income as primary driver (p<0.001) and education showing negative relationship when controlling for income (B=-0.85, p=0.0009), suggesting financial resources/healthcare access may outweigh formal schooling. Knowledge is necessary but insufficient—structural barriers override awareness.

**H2 (Attitude-Exclusivity Link): Partially Supported.** Despite positive attitudes, 15% were "Very Uncomfortable" with public breastfeeding. Public comfort didn't predict EBF cessation ($\chi^2$(1)=0.012, p=0.914, OR=0.98). Cessation driven by physical/structural barriers (C-sections, health complications, PIMS) rather than social stigma. Income predicted knowledge but not comfort (r=0.183, p=0.15), indicating cultural barriers operate independently of socioeconomic resources.

**H3 (Socioeconomic Influence): Partially Supported.** Income and education significantly predicted knowledge ($R^2$=0.441), but Pearson's correlations showed weak, non-significant relationships between income and other outcomes (r=0.10-0.19, p>0.05). Socioeconomic status drives knowledge acquisition, but broader influences require larger-cohort investigation.

**H4 (Practice-Growth Impact): Supported.** 85% stunting prevalence aligns with suboptimal practices. CF status significantly predicted length deficits (B=-2.71, p=0.042), with infants starting solids before six months showing 2.71 cm greater deficits. C-section infants showed 2.28 cm greater mean length deficit (Cohen's d=0.48, p=0.32)—clinically meaningful pattern despite non-significance. Mothers maintaining shortest EBF duration (1 month) exhibited most severe stunting (-9.0 cm), illustrating dose-response.

**H5(Barriers-Outcomes): Strongly Supported.** 85% of delayed initiations resulted from C-sections. Critical finding: despite 85% exhibiting stunting, 85% of mothers rated growth as "Average" or "Above Average." Only mothers with severe deficits (-8.8 to -9.0 cm) reported "Below Average" growth—abnormally high thresholds mask widespread sub-optimal growth. Infants with weight deficits showed median feeding frequency 1.0 hour, indicating mothers responded to hunger cues, yet this was insufficient to overcome caloric deficits.

**Key Points:** While 65% achieved timely initiation, 35% delayed due to C-sections/maternal health, not knowledge deficits—birthing center structure is primary limiting factor[8]. The 85% stunting-85% perception disconnect constitutes a major intervention barrier.

While sample size (N=60) limits power for some analyses (particularly Tests #6-7), validated core findings on education-knowledge links ($R^2$=0.679), feeding timing-growth relationships (p=0.042), and perception-reality gap provide immediate clinical value. Descriptive patterns in less-powered analyses (C-section Cohen's d=0.48, income-outcome relationships) serve as hypothesis-generating foundations for future investigations.

**Limitations:** Modest sample (N=60) limits statistical power. Cross-sectional design precludes causal relationships; prospective designs with 200+ participants would enable stronger inference. Self-reported practices introduce bias. Unmeasured confounders (formula marketing, workplace policies) not assessed.

## Conclusion

High maternal knowledge and positive attitudes coexist with 85% infant stunting. Income and education explain 44.1% of knowledge variance (F(2,57)=22.46, p<0.001, $R^2$=0.441), yet are insufficient to ensure optimal growth. While 65% achieved timely initiation, structural barriers—particularly C-sections (85% of delayed initiations)—hindered adherence. A profound perception gap exists: 85% of mothers perceived stunted growth as "Average" or above. Early complementary feeding significantly predicted length deficits (B=-2.71, p=0.042, 95% CI [-5.32, -0.10]).

H1, H4, and H5 received strong support; H2 was not supported; H3 was partially supported. Limited sample (N=60) constrains power for exploratory analyses but provides validated findings demonstrating interventions must address clinical environments, structural barriers, and maternal perceptual frameworks—not just knowledge dissemination. Future studies should employ longitudinal designs to validate patterns and examine mechanisms linking delivery methods to growth outcomes.

**Recommendations**

Mandate immediate skin-to-skin contact and breastfeeding within one hour for all deliveries, including C-sections[8]. Link KAP counseling with objective growth metrics to resolve the 85% perception gap[9]. Address cultural discomfort through community campaigns, legislative advocacy, and "Breastfeeding Welcome" certification programs[10]. Target affluent mothers with PIMS counseling, train private pediatricians in evidence-based lactation support, and regulate formula marketing[11]. **Future Research:** Employ larger, longitudinal designs (N=200+) beginning during pregnancy through 24 months postpartum to validate observed patterns and examine unmeasured confounders.

**Conflict of Interest:** None

**Source of Funding:** None

**Ethical Clearance:**MNR Medical University Ethics committee reference number [MNR EC-BHR-67/24] Date cleared : 06.12.2024

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