



www.bioinformation.net  
Volume 22(4)



Research Article

Received April 1, 2026; Revised April 30, 2026; Accepted April 30, 2026, Published April 30, 2026

DOI: 10.6026/973206300222020

SJIF 2026 (Scientific Journal Impact Factor for 2026) = 8.478  
2022 Impact Factor (2023 Clarivate Inc. release) is 1.9

**Declaration on Publication Ethics:**

The author's state that they adhere with COPE guidelines on publishing ethics as described elsewhere at <https://publicationethics.org/>. The authors also undertake that they are not associated with any other third party (governmental or non-governmental agencies) linking with any form of unethical issues connecting to this publication. The authors also declare that they are not withholding any information that is misleading to the publisher in regard to this article.

**Declaration on official E-mail:**

The corresponding author declares that lifetime official e-mail from their institution is not available for all authors

**License statement:**

This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly credited. This is distributed under the terms of the Creative Commons Attribution License

**Comments from readers:**

Articles published in BIOINFORMATION are open for relevant post publication comments and criticisms, which will be published immediately linking to the original article without open access charges. Comments should be concise, coherent and critical in less than 1000 words.

**Disclaimer:**

Bioinformation provides a platform for scholarly communication of data and information to create knowledge in the Biological/Biomedical domain after adequate peer/editorial reviews and editing entertaining revisions where required. The views and opinions expressed are those of the author(s) and do not reflect the views or opinions of Bioinformation and (or) its publisher Biomedical Informatics. Biomedical Informatics remains neutral and allows authors to specify their address and affiliation details including territory where required.

Edited by A Prashanth  
E-mail: [phyjunc@gmail.com](mailto:phyjunc@gmail.com)  
Phone: +91 7259404071

Citation: Venkatesh *et al.* Bioinformation 22(4): 2020-2024 (2026)

# Maternal feeding knowledge and practices as determinants of nutritional status in under-five children

Jeevitha Solor Venkatesh<sup>1</sup>, Meenal Kulkarni<sup>2</sup> & K Senthil Kumar<sup>3,\*</sup>

<sup>1</sup>Department of Medicine, Sapthagiri Institute of Medical Science, Karnataka, India; <sup>2</sup>Department of Community Medicine, Professor, NKP Salve Institute of Medical Sciences & RC and Lata Mangeshkar Hospital, Nagpur, India; <sup>3</sup>Department of Physiology, Madha Medical College & RI, Tamil Nadu, India; \*Corresponding author

**Affiliation URL:**

<https://www.simsr.edu.in/>  
<https://nkpsims.edu.in/lata-mangeshkar-hospital/>

<https://mmcri.in/>

**Author contacts:**

Jeevitha Solor Venkatesh - E-mail: jeevithayv4@gmail.com; Phone: +91 8861481443

Meenal Kulkarni - E-mail: meenalkulkarni76@gmail.com

K Senthil Kumar - E-mail: drksk.cool@gmail.com; Phone: +91 9940416604

**Abstract:**

Under-five malnutrition remains a persistent public health burden in low- and middle-income countries, contributing substantially to morbidity and impaired growth. Therefore, it is of interest to evaluate maternal knowledge, attitude and feeding practices (KAP) and examined their association with anthropometric indicators among children aged 6 months to 5 years. Maternal KAP was assessed using a structured questionnaire and child nutritional status was determined using weight-for-age, height-for-age and mid-upper arm circumference based on WHO standards. Moderate knowledge (53.3%) and practices (56.7%) were observed, while 23.3% were underweight, 20% stunted and 13.3% wasted. Thus, maternal feeding practices demonstrated significant positive correlations with weight-for-age ( $r=0.52$ ), height-for-age ( $r=0.47$ ) and MUAC ( $r=0.50$ ), indicating behavioral determinants strongly influence child growth outcomes.

**Keywords:** Maternal education, child malnutrition, knowledge, attitude and practice (KAP), dietary diversity, complementary feeding, anthropometric measurements, child growth, nutrition, maternal knowledge, nutritional practices, under-five children

**Background:**

Malnutrition remains a leading contributor to morbidity and mortality among children under five years, particularly in low- and middle-income countries [1]. Recent evidence indicates that underweight, stunting and wasting continue to affect a substantial proportion of children despite ongoing nutrition programs [2, 3]. Early childhood nutrition is crucial for optimal physical growth, neurocognitive development and immune competence [4]. Inadequate dietary diversity, delayed complementary feeding and improper feeding frequency are persistent determinants of under nutrition [5]. Maternal knowledge and caregiving practices significantly influence child feeding behaviors and household dietary decisions [6]. Studies have shown that insufficient maternal nutrition literacy is associated with poor growth indicators and higher prevalence of stunting and wasting [7, 8]. However, knowledge alone does not consistently translate into appropriate feeding practices, indicating behavioral and contextual barriers [9]. Attitudinal factors and maternal self-efficacy further modify adherence to recommended feeding guidelines [10]. Anthropometric indicators such as weight-for-age, height-for-age and mid-upper arm circumference remain standardized measures for evaluating nutritional status and growth outcomes [3, 4]. Examining the relationship between maternal KAP and objective anthropometric indices provides measurable insight into behavioral determinants of child nutrition [6, 8]. Despite expanded public health initiatives, gaps persist between awareness and actual implementation of optimal feeding practices [5, 9]. Therefore, it is of interest to evaluate maternal knowledge, attitude and feeding practices and analyse their association with anthropometric indicators among under-five children.

**Materials and Methods:**

This cross-sectional descriptive study was conducted among mothers of children aged 6 months to 5 years attending selected

community health centers and pediatric outpatient clinics. The sample size was estimated using prevalence data from recent maternal nutrition knowledge studies, targeting a minimum of 150 mother-child dyads to ensure adequate statistical power. Participants were recruited using purposive sampling based on eligibility criteria. Mothers with children within the specified age group who provided informed consent were included. Maternal knowledge, attitude and feeding practices were assessed using a pre-tested structured questionnaire. The knowledge component evaluated awareness of breastfeeding, complementary feeding, dietary diversity and meal frequency. The attitude section assessed perceptions toward recommended child feeding behaviors. The practice section captured actual feeding frequency, food variety, hygiene practices and complementary feeding initiation. The questionnaire was pilot tested among a subset of mothers to assess clarity and internal consistency. Necessary modifications were made prior to final data collection. Child anthropometric measurements were obtained following WHO standardized protocols. Weight was measured using a calibrated digital weighing scale with minimal clothing. Length or height was measured using an infantometer or stadiometer as appropriate for age. Mid-upper arm circumference (MUAC) was measured using a non-stretchable measuring tape. Weight-for-age, height-for-age and weight-for-height Z-scores were calculated using WHO growth standards. Underweight, stunting and wasting were defined as Z-scores below  $-2$  standard deviations. Data were entered and analysed using statistical software. Descriptive statistics summarized maternal KAP levels and anthropometric categories. Pearson correlation analysis assessed the association between maternal practice scores and anthropometric indicators. Statistical significance was set at  $p < 0.05$ . Ethical approval was obtained from the institutional ethics committee. Written informed consent was secured from all participants. Confidentiality and anonymity were strictly maintained throughout the study.

**Results:**

A total of 150 mother-child dyads were included in the analysis. The largest proportion of children was aged 13–24 months (26.7%). Most mothers had secondary-level education (36.7%). Moderate knowledge (53.3%), neutral attitudes (46.7%) and moderate feeding practices (56.7%) were predominant. Underweight, stunting and wasting were observed in 23.3%, 20.0% and 13.3% of children, respectively. Significant positive correlations were identified between maternal practices and anthropometric indicators. Children of mothers with higher KAP scores demonstrated better nutritional status. **Table 1** shows that the highest proportion of children (26.7%) was aged 13–24 months, while the lowest proportion (16.7%) were aged 6–12 months. **Table 2** indicates that 36.7% of mothers had secondary education, whereas 10% had no formal education. **Table 3** demonstrates that 53.3% of mothers had average knowledge scores, while 13.3% had poor knowledge. **Table 4** highlights that 46.7% of mothers had neutral attitudes, compared to 16.7% with negative attitudes. **Table 5** shows that 56.7% of mothers exhibited moderate feeding practices, while 20% demonstrated poor practices. **Table 6** indicates that 23.3% of children were underweight, whereas 66.7% had normal weight-for-age. **Table 7** demonstrates that 20% of children were stunted, while 76.7% had normal height-for-age. **Table 8** shows that 13.3% of children were wasted compared to 76.7% with normal weight-for-height. **Table 9** indicates significant positive correlations between maternal practices and weight-for-age ( $r=0.52$ ), height-for-age ( $r=0.47$ ) and MUAC ( $r=0.50$ ), all with  $p<0.01$ . **Table 10** demonstrates that undernutrition was more frequent among children of mothers with poor KAP, while normal nutrition was predominant among those with good KAP.

**Table 1:** Distribution of participants by age of children

Age Group (months)	Number of Children	Percentage (%)
6–12	25	16.7
13–24	40	26.7
25–36	30	20.0
37–48	28	18.7
49–60	27	18.0
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 2:** Maternal education level

Education Level	Number of Mothers	Percentage (%)
No formal education	15	10.0
Primary school	45	30.0
Secondary school	55	36.7
Graduate/Postgraduate	35	23.3
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 3:** Maternal knowledge on nutrition

Knowledge Level	Number of Mothers	Percentage (%)
Poor (0–4)	20	13.3
Average (5–7)	80	53.3
Good (8–10)	50	33.4
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 4:** Maternal attitude toward child nutrition

Attitude Level	Number of Mothers	Percentage (%)
Negative (0–3)	25	16.7
Neutral (4–6)	70	46.7
Positive (7–9)	55	36.6
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 5:** Maternal practices regarding child feeding

Practice Level	Number of Mothers	Percentage (%)
Poor	30	20.0
Moderate	85	56.7
Good	35	23.3
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 6:** Anthropometric status - weight-for-age

Category	Number of Children	Percentage (%)
Underweight	35	23.3
Normal	100	66.7
Overweight	15	10.0
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 7:** Anthropometric status - height-for-age

Category	Number of Children	Percentage (%)
Stunted	30	20.0
Normal	115	76.7
Tall	5	3.3
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 8:** Anthropometric status - weight-for-height

Category	Number of Children	Percentage (%)
Wasted	20	13.3
Normal	115	76.7
Overweight	15	10.0
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 9:** Correlation between maternal practices and anthropometric indicators

Correlation Type	r-value	p-value
Practices vs Weight	0.52	<0.01
Practices vs Height	0.47	<0.01
Practices vs MUAC	0.50	<0.01

**Table 10:** Maternal KAP level and child nutritional status (Corrected Total = 150)

KAP Level	Normal Nutrition	Undernourished	Total
Poor	10	40	50
Average	70	30	100
Good	40	10	50
<b>Total</b>	<b>120</b>	<b>80</b>	<b>200</b>

**Discussion:**

This study examined maternal knowledge, attitude and feeding practices and their association with anthropometric outcomes among under-five children [11]. Moderate knowledge and practice levels were predominant, while a substantial proportion of children remained underweight, stunted, or wasted [12]. Similar findings have been reported in recent community-based studies showing persistent undernutrition despite moderate maternal awareness [13]. These findings suggest that knowledge alone may not be sufficient to ensure optimal nutritional outcomes. Although over half of mothers demonstrated average knowledge, gaps were observed in complementary feeding and dietary diversity practices. Recent evidence indicates that inadequate dietary diversity and delayed complementary feeding remain strong predictors of stunting and wasting [14]. Studies have shown that maternal nutrition literacy improves feeding quality only when accompanied by behavioral reinforcement and social support [15]. This may explain the moderate translation of knowledge into practice observed in the present study. Maternal attitudes were largely neutral, which may reflect limited self-efficacy or socio-cultural constraints affecting feeding decisions. Contemporary research highlights that positive maternal attitudes and confidence significantly

influence adherence to recommended feeding guidelines [16]. Behavioral determinants such as household food security, time constraints and cultural norms further mediate feeding practices [17]. Therefore, attitude and contextual factors remain critical in shaping child nutrition outcomes. The prevalence of underweight (23.3%), stunting (20%) and wasting (13.3%) in this study is consistent with recent regional reports from similar settings [18]. Despite ongoing nutrition programs, undernutrition continues to pose a significant public health challenge [19]. These findings reinforce the need for targeted behavioral interventions rather than knowledge-based education alone. A key finding was the significant positive correlation between maternal practices and anthropometric indicators, including weight-for-age, height-for-age and MUAC. Comparable studies have demonstrated that improved feeding practices are directly associated with better growth indices [20]. The strength of correlation observed in this study underscores the measurable impact of maternal behavior on child growth outcomes. This provides objective anthropometric evidence linking caregiving practices to nutritional status. Importantly, children of mothers with poor KAP scores were more likely to be undernourished, whereas those with good KAP scores were predominantly normally nourished. Recent longitudinal analyses have similarly identified maternal practice as an independent predictor of nutritional status [21]. By integrating subjective KAP assessment with objective anthropometric measures, this study strengthens the behavioral-biological linkage in child nutrition research. This contributes contemporary evidence emphasizing that practice-oriented interventions may yield measurable improvements in growth indicators. Community-based nutrition strategies should therefore prioritize behavior modification, complementary feeding counseling and growth monitoring. Interventions combining maternal education with practical skill-building have demonstrated improved dietary diversity and reduced stunting rates [22]. Strengthening maternal empowerment and consistent anthropometric surveillance may enhance early detection and prevention of under nutrition. Overall, this study reinforces that maternal feeding practices are significant determinants of child anthropometric outcomes. Bridging the gap between knowledge and behavior remain essential for sustainable improvement in under-five nutritional status.

#### Conclusion:

Under-five malnutrition persists despite moderate maternal knowledge and attitudes, indicating that awareness alone are insufficient to improve child growth outcomes. Maternal feeding practices showed significant positive associations with anthropometric indicators, providing objective evidence that behavior directly influences nutritional status. Thus, targeted,

practice-oriented nutrition interventions and strengthened maternal empowerment are imperative to translate knowledge into measurable improvements in child growth and development.

#### Acknowledgement:

We acknowledge that the first and second author contributed equally to this paper and hence they are considered as joint first author

#### References:

- [1] Forh G *et al. Heliyon.* 2022 **8**:e12330 [PMID: 36590498]
- [2] Mehmood R *et al. J Coll Physicians Surg Pak.* 2023 **33**:775 [PMID: 37401219]
- [3] Khalil HA *et al. Front Nutr.* 2022 **9**:815000 [PMID: 35299758]
- [4] de Sousa KG *et al. Ecol Food Nutr.* 2024 **63**:63 [PMID: 38308642]
- [5] Prasad R *et al. J Family Med Prim Care.* 2023 **12**:2366 [PMID: 38074243]
- [6] Yeganeh S *et al. BMC Pediatr.* 2023 **23**:256 [PMID: 37221484]
- [7] Matee N *et al. BMC Pediatr.* 2024 **24**:808 [PMID: 39696152]
- [8] Ayele AW *et al. BMC Nutr.* 2025 **11**:151 [PMID: 40731299]
- [9] Bakare AA *et al. Ann Ib Postgrad Med.* 2023 **21**:50 [PMID: 37528813]
- [10] Villarreal VMC *et al. Matern Child Health J.* 2025 **29**:87 [PMID: 39546151]
- [11] Nsiah-Asamoah C *et al. BMC Pediatr.* 2022 **22**:581 [PMID: 36207712]
- [12] Satapathy DM *et al. Indian J Public Health.* 2021 **65**:147 [PMID: 34135183]
- [13] Randhawa S *et al. Front Nutr.* 2024 **11**:1413867 [PMID: 39777072]
- [14] Palanichamy M & Solanki MJ. *J Family Med Prim Care.* 2021 **10**:175 [PMID: 34017722]
- [15] Jasani KM *et al. Indian J Community Med.* 2025 **50**:641 [PMID: 40837167]
- [16] Liao M *et al. Wei Sheng Yan Jiu.* 2023 **52**:972 [PMID: 38115668]
- [17] Anin SK *et al. Nutrients.* 2020 **12**:2565 [PMID: 32847027]
- [18] Singh A *et al. Cureus.* 2025 **17**:e84619 [PMID: 40546512]
- [19] Braddon KE *et al. J Nutr.* 2023 **153**:2421 [PMID: 37356500]
- [20] Ortiz Félix RE *et al. Nutr Hosp.* 2025 **42**:211 [PMID: 39575604]
- [21] Mbhenyane X *et al. Ecol Food Nutr.* 2024 **63**:281 [PMID: 38770798]
- [22] Hailu FM *et al. Front Public Health.* 2023 **11**:1256499 [PMID: 37965506]

*Caveat Emptor is applicable among the literate community where required and possible. The publisher, its journal, editors and the*

*internal/external reviewers take adequate steps to check, evaluate, correct, edit, revise and improve content where possible and required.*