ORIGINAL ARTICLE

An epidemiological study of Infant & Young Child Feeding (IYCF) Practices, and its association with malnutrition among children of age 06-24 months in the rural areas in the Gautam Buddha Nagar District, Uttar Pradesh

Sachin K Nagar[1], Amit Singh Pawaiya[2], Neha Tyagi[3], Meraj Gohar[4], Shalini Srivastava[5], Harsh Mahajan[6]

Department of Community Medicine, School of Medical Sciences & Research (SMSR), Sharda University, Uttar Pradesh

CORRESPONDING AUTHOR

Dr Meraj Gohar, Department of Community Medicine, SMS&R, Sharda University, Uttar Pradesh 201306

Email: mohammad.gohar@sharda.ac.in

CITATION

Nagar SK, Pawaiya AS, Tyagi N, Gohar M, Srivastava S, Mahajan H. An epidemiological study of Infant & Young Child Feeding (IYCF) Practices, and its association with malnutrition among children of age 06-24 months in the rural areas in the Gautam Buddha Nagar District, Uttar Pradesh. Indian J Comm Health. 2025;37(6):997-1001. https://doi.org/10.47203/IJCH.2025.v37i06.018

ARTICLE CYCLE

Received: 19/08/2025; Accepted: 05/12/2025; Published: 31/12/2025

ABSTRACT

Background: Infant & Young Child Feeding (IYCF) practices are critical in ensuring optimal growth and nutrition in early childhood. Inadequate IYCF contributes significantly to childhood malnutrition. **Aim & Objective:** To assess IYCF practices and to find its association with malnutrition among children of age 06–24 months in rural Gautam Buddha Nagar, Uttar Pradesh. **Methodology:** Community-based, Cross-sectional study was conducted among 247 mothers with their children of age 06 to 24 months. Data-collection was done through a house-to-house survey, using a semi-structured WHO-based IYCF questionnaire. Nutritional status was assessed using anthropometric measurements. Statistical SPSS-22 was used for data analysis, with a p-value of <0.05 was deemed significant. **Results:** Only 22.3% of participants followed optimal IYCF practices. The prevalence of malnutrition was 23.4%, with stunting (52.5%) being the most common form. A significant association(p <0.05) found between optimal IYCF practices & malnutrition. Children who fulfill the criteria for acceptable diet (MAD), meal frequency (MMF), and minimal dietary diversity (MDD) had notably lower malnutrition rates. **Conclusion:** The study highlights the low prevalence of optimal IYCF practices and their significant protective effect against malnutrition. Strengthening maternal education and promoting proper practices of feeding are crucial for reducing child malnutrition in rural communities.

KEYWORDS

IYCF, Malnutrition, MDD, MMF, MAD

INTRODUCTION

IYCF (Infant & Young Child Feeding)(1) includes initiation of breast-feeding within an hour(<1 hour) of birth, exclusive-breastfeeding(EBF) for 06 months, and introducing timely, adequate, and diverse complementary foods alongside breastfeeding continued up to two years, as per recommendations by both the World Health Organization(WHO) and United Nations Children Funds(UNICEF). Inadequate IYCF practices are major contributors to malnutrition, illness, & mortality in young children(2,3). Undernutrition alone accounts for ~45 per cent of all deaths among children below the age of five(3). In 2022, an estimated 149 million children under-5 were stunted, 45 million under-5 children were wasted, and nearly 39 million were overweight or obese(3). Optimal IYCF could save over 820,000 young lives annually and improve cognitive and economic outcomes. Despite these benefits, IYCF practices remain suboptimal(3). As per NFHS-5, 41.8% early breastfeeding initiation(EIBF), exclusive-

breastfeeding in 63.7%, & adequate complementary feeding in 11.1% children in India. In Uttar Pradesh, the rates are even lower: 23.9%, 59.7%, and 6.1%, respectively(4). So, this study was conducted to observe IYCF-practices & their association with malnutrition in children of age 06-24 months.

MATERIAL & METHODS

Design and Setting: A community-based(cross-sectional) study.

Study Participants: Mothers who had children between the ages of 06 and 24 months.

Inclusion Criterion: (i) Mothers who had children between the ages of 06 and 24 months, who gave written informed consent, and were residing in the study area for more than six months.

Exclusion Criterion: Children with any chronic diseases, congenital defects or mental disorders.

Sample Size and Sampling Technique: According to NFHS-5 and the District demographic profile of Gautam Buddha Nagar, 11.1 per cent of children aged 06-23 months received an adequate diet(4). So, the prevalence was taken as 11.1%. The sample size formula: **N** = $Z^2P(1-P)/L^2$ (**N =** Sample Size, **P** = Prevalence, **Z** = taken here as 1.96, and **L** = absolute precision, taken here as 5%, including a 10 per cent non-response rate. So, final sample-size was taken as 247 children aged 06 to 24 months. In the present study, all eight villages catered to by the Community Medicine Department of a tertiary medical college in District Gautam Buddha Nagar were included. A line listing of all the eligible participants was done, then the PPS sampling technique was used to decide the number of subjects to be selected per village. A systematic random-sampling technique was applied for subjects from particular village.

Data Collection Tool and Techniques: For the present study, data collection was done by house to house survey using a validated WHO-based IYCF questionnaire translated into the local language for assessing the IYCF practices of mothers of children of age 6 to 24 months(5). Nutritional status of children was assessed through details of anthropometric measurements using the WHO Growth Charts(6). The standard definitions of IYCF practices used in the study were as follows: Minimum Dietary Diversity(MDD)(3): Children between the ages of six and twenty-three months who consumed foods and beverages from at least five of the eight pre-defined food groups the day before. Minimum-Meal-Frequency(MMF)(3): Children aged 06–23 months who consumed soft, semi-solid, or solid foods (and feeds of milk for artificially fed children) in a day, based on age and status of breastfeeding. For breast-fed infants of age 06–08 months, the minimum is two meals/day; breast-fed children of age 9–23 months, it is 3 meals/day; and artificially fed children of age 06–23 months, it is 4 meals per day. Minimum-Acceptable-Diet(MAD)(3): Breastfed and artificially fed children, receiving atleast the MDD, and MMF for their age a day before.

Statistical Analysis: (i)The data was recorded into and analyzed using MS Excel Spreadsheet and SPSS version 22. (ii) Pearson's X^2 test analyzed the association of quantitative variables. (iii) p-value of <= 0.05 was considered significant.

Ethical Considerations: (i) Approvals from the Institutional Ethics-Committee were obtained(Ref. No. SU/SMS&R/76-A/2023/107). (ii) The data were collected after obtaining informed written consent.

RESULTS

Out of 247 children, most of the children (68.8%) were of age 12–24 months, with males (54.7%) than females (45.3%). Most participants were Hindus (97.2%). Nearly half of the children were of the first birth order(47.4%), and the majority of mothers were aged 18–24 years (75.7%). A large proportion of mothers were literate (85.4%) and homemakers (94.7%). Most families belonged to joint or three-generation households (72.5%). Regarding socio-economic status, the majority were from the middle class (44.9%) as per the modified-B.G.Prasad's Scale(7), malnutrition was present in 25.1% of the children, while 74.9% were well-nourished (Table-1).

Table-1: Study Participants' distribution as per Socio-demographic Characteristics (N=247):

Age of Children(months)	**n(%)**
6- 8 months	31(12.6)
9- 11 months	46(18.6)
12- 24 months	170(68.8)
Gender of the Child	
Male	135(54.7)
Female	112(45.3)
Religion	
Hindu	240(97.2)
Muslim	7(2.8)
Birth Order	
First	117(47.4)
Second	83(33.6)
Third and Above	47(19.0)
Age of Mother(Years)	
18- 24	187(75.7)
25- 34	56(22.7)
>=35	4(1.6)
Education of Mother	
Illiterate	36(14.6)
Literate	211(85.4)
Occupation of Mother	

Age of Children(months)	n(%)
Unemployed/Homemaker	234(94.7)
Employed	13(5.3)
Type of Family	
Nuclear	68(27.5)
Joint Family/ 3 Generation	179(72.5)
SES(Mod.B.G. Prasad's Scale)	
I,(Upper-Class)	15(6.1)
II,(Upper Middle-Class)	67(27.1)
III,(Middle-Class)	111(44.9)
IV,(Lower Middle-Class)	54(21.9)

Only 36.8 per cent of infants were breastfed within an hour of birth, and 27.1 per cent were exclusively-breastfed(EBF) for 06 months. While 53.8% received timely complementary feeding, just 22.3% met overall optimal IYCF practices. Dietary indicators such as MDD(74.1%), MMF(66.0%), and MAD(66.0%) showed adequacy in diversity, frequency, and acceptability (Table-2).

Table-2: Study Participants distribution according to the Infant & Young Child Feeding practices(IYCF) (N=247):

Breastfeeding Initiation	n(%)
Within an hour	91(36.8)
Same day, after an hour	156(63.2)
Exclusive BF for 6 months of Age	
Yes	67(27.1)
No	180(72.9)
Timely Complementary-Feeding Initiation (at 06-months)	
Yes	114(46.2)
No	133(53.8)
Continued Breastfeeding along with complementary feeding	
Yes	127(51.4)
No	120(48.6)
Minimum Dietary Diversity (Past 24 Hours)	
Present	183(74.1)
Absent	64(25.9)
Minimum Meal Frequency (Past 24 Hours)	
Present	163(66.0)
Absent	84(34.0)
Minimum Acceptable Diet (Past 24 Hours)	
Present	163(66.0)
Absent	84(34.0)
Optimal IYCF practice*	
Yes	55(22.3)
No	192(77.7)

**Optimal IYCF practice includes the following: breastfeeding initiation within an hour, exclusive-breast feeding (EBF) for 06 months of age, timely complementary feeding initiation, MDD, MMF, MAD.*

Malnutrition was present in 25.1% of the children, while 74.9% were well-nourished. Initiating breastfeeding within an hour of birth was associated with a reduced peril of malnutrition (OR:0.76; 95%-CI:0.42–1.41); however, the association was not significant (p=0.387). In distinction, exclusive breastfeeding for first six months showed a significant protective effect against malnutrition (OR:0.43; 95%-CI: 0.26–1.01; p=0.024), emphasizing the importance of sustained exclusive breastfeeding during early infancy. Timely complementary feeding initiation at six months also showed lower odds of malnutrition (OR:0.61; 95%-CI: 0.34–1.10); nonetheless, the result was not statistically significant(p=0.098). Notably, continued breastfeeding(BF) along with complementary feeding(CF) was strongly associated with reduced malnutrition (OR:0.096; 95%-CI: 0.045–0.206; p<0.0001), emphasizing vital role of sustained breastfeeding beyond six months. Furthermore, key dietary practices such as ensuring minimum dietary diversity (OR:0.034; 95%-CI: 0.01–0.90; p<0.001), minimum meal frequency (OR:0.03; 95%-CI: 0.01–0.07; p<0.001), and minimum acceptable diet (OR:0.05; 95%-CI: 0.02–0.10; p<0.001) were all significantly associated with a substantial reduction in malnutrition, with high significant p-values (p=0.001). Findings reflect the necessity of not just feeding, but feeding appropriately in terms of frequency, quality, and quantity. Overall, participants who followed optimal IYCF practices had significantly lower the odds of being malnourished (OR:0.43; 95%-CI: 0.19–0.98; p=0.040), highlighting that a combination of timely, adequate, and diverse feeding practices is essential for healthy growth and development in early childhood (Table-3).

Table-3: Association of Infant and Young Child Feeding(IYCF) Practices with Malnutrition (N=247):

	Malnutrition		OR(95%-CI)	*p*-value
Breast-feeding initiation within 1 hour	Present	Absent		
Yes	20(22.0)	71(78.0)	0.76 (0.42–1.41)	0.387
No	42(26.9)	114(73.1)		
Exclusive Breastfeeding till 6 months of age				
Yes	10(14.9)	57(85.1)	0.43 (0.26–1.01)	**0.024**
No	52(28.9)	128(71.1)		

Timely Complementary Feeding initiation at 6 months				
Yes	23(20.2)	91(79.8)	0.61 (0.34–1.10)	0.098
No	39(29.3)	94(70.7)		
Continued Breastfeeding along with Complementary feeding				
Yes	9(7.1)	118(92.9)	0.096 (0.04–0.21)	**<0.0001**
No	53(44.2)	67(55.8)		
Minimum Dietary Diversity				
Yes	5(2.7)	178(97.3)	0.034 (0.01–0.90)	**<0.001**
No	57(89.1)	7(10.9)		
Minimum Meal Frequency				
Yes	8(4.9)	155(95.1)	0.03(0.01–0.07)	**<0.001**
No	54(64.3)	30(35.7)		
Minimum Acceptable Diet				
Yes	11(6.8)	152(93.2)	0.05(0.02–0.10)	**<0.001**
No	51(60.7)	33(39.3)		
Optimal IYCF Practice				
Yes	8(14.6)	47(85.4)	0.43 (0.19–0.98)	**0.040**
No	54(28.2)	138(71.8)		

DISCUSSION

In this study, 247 mothers with children of age 06 to 24 months were assessed for knowledge & practice of IYCF, malnutrition prevalence, & its association with IYCF practices. In the current study, Exclusive breast-feeding(EBF) for the advised 06 months, was practiced by 27.1% of mothers. These findings were coherent with studies conducted by Caroline Katharina Stiller et. al. in 2020(8) in the tribal village of District Birbhum, West Bengal, which showed the practice of exclusive breast-feeding in 32.9% of mothers. The present study discusses well-timed introduction of complementary-feeding, which was achieved in 53.8% of cases, which is in line with the study by Mansi Vijaybhai Dhami et. al., 2019(9) (38%). Continued breastfeeding after 6 months of age of children was practiced by 51.4% of mothers, which is in line with a study conducted by Sandhya Rani Javalkar in 2019(10) in the rural area of Mangalore Taluk, which found continued breastfeeding was practiced by 60.4% of mothers. The current study shows that minimum dietary diversity was met in 74.1% of children. One of the study by Mansi Vijaybhai Dhami et. al. in 2019(9) in India found that MDD(diversity in diet) was highest in the South (33%) and lowest in the Central region(12%) of India. Another study by Phuong Hong Nguyen in 2018(11) found that MDD was met in 21% of children. In our study, minimum meal-frequency(MMF) and the minimum acceptable-diet(MAD) were achieved in 66.0% of children. A study conducted by Angeline Jeyakumar et. al. in 2022(12) in Pune, Maharashtra, showed that minimum meal-frequency (MMF) was achieved in 76.5% of children, and minimum acceptable-diet (MAD) was achieved in 14.9% of children. Also, in a study conducted by Shweta Khandelwal et. al. in 2022(13) in Belagavi, Karnataka, found that a large majority(94.4%) of children met minimum meal-frequency(MMF), but only 55% of children received a minimum acceptable-diet(MAD). The overall prevalence of malnutrition was 23.4%. Similar findings were reported by Pavani Varma et al. (2022) (29.6%) in rural Hyderabad(14) and by Meshram Indrapal Ishwarji et al. (2018) (26%) in rural Gujarat(15). MDD, MMF, and MAD were strongly associated with lower malnutrition rates (all $p = 0.0001$); children meeting these criteria were not malnourished. This is supported by Pradhan et al. (2023)(16), who found that MDD and breastfeeding are protective against undernutrition, and by Dey et al. (2021), who reported higher malnutrition rates among children lacking MMF, MDD, and MAD ($p < 0.001$)(17).

CONCLUSION

The study shows the crucial role of maternal knowledge & practices in shaping Infant & Young Child Feeding (IYCF) outcomes and its direct association with malnutrition in children of age 6 to 24 months. While awareness of breastfeeding benefits was high, gaps in exclusive breastfeeding, early initiation, and complementary feeding practices were evident. The results emphasize the need for targeted-interventions, including educational programs & community and family support, to improve IYCF adherence and reduce malnutrition rates. Strengthening maternal education and addressing cultural and socioeconomic barriers can significantly enhance

child nutrition and overall health in rural communities.

RECOMMENDATION

Strengthening counselling on early initiation of breastfeeding, exclusive breastfeeding for six months, and timely, adequate complementary feeding should be prioritized through frontline health workers. Regular growth monitoring, mother support groups, and focused behaviour change communication at village level can improve dietary diversity and meal frequency.

LIMITATION OF THE STUDY

Information on feeding practices was based on mothers' recall, which may have introduced recall bias, particularly for past events such as exclusive breastfeeding.

RELEVANCE OF THE STUDY

This study provides district-level evidence from rural Gautam Buddha Nagar on the link between Infant and Young Child Feeding (IYCF) practices and malnutrition among children aged 6–24 months. It adds to current knowledge by highlighting that not only breastfeeding, but also minimum dietary diversity, meal frequency, and minimum acceptable diet significantly influence nutritional status.

AUTHORS CONTRIBUTION

All authors have contributed equally.

FINANCIAL SUPPORT AND SPONSORSHIP

NIL

CONFLICT OF INTEREST

NIL

ACKNOWLEDGEMENT

Dr. Neeraj Pal Singh, Biostatistician cum Assistant Professor, Department of Community Medicine, SMS&R, Sharda University

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

Yes

REFERENCES

1. WHO. Infant and young child feeding counselling. World Health Organization. Accessed on February 02, 2025.: A3929. Available from: http://whqlibdoc.who.int/publications/2009/9789241597494_eng.pdf
2. Govt. of India (2013). Operational Guidelines on Facility based Management of Children with severe acute malnutrition, Ministry of Health and Family Welfare, New Delhi. Angew Chemie Int Ed 6(11), 951–952. 2021;2013–5. Available from: https://www.nhm.gov.in/images/pdf/programmes/child-health/IEC-materials/participant-manual_fbcsa-Malnutrition.pdf
3. Infant and young child feeding accessed on February 02, 2025. Available from: https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding
4. 'Release of NFHS-5 (2019-21) - Compendium of Factsheets | Ministry of Health and Family Welfare | GOI. '
5. Indicators for assessing infant and young child feeding practices: definitions and measurement methods. Accessed on Mar 2, 2025]. Available from: https://www.who.int/publications/i/item/9789240018389
6. The WHO Child Growth Standard. [cited 2025 Aug 6]. Available from: https://www.who.int/tools/child-growth-standards
7. Anand A, Mandal I, Hossain S. B.G. Prasad Scale 2025: An Updated Framework for Socioeconomic Assessment in India. National Journal of Community Medicine. 2025 May 1;16(05):555–8.
8. Stiller CK, Golembiewski SK, Golembiewski M, Mondal S, Biesalski HK, Scherbaum V. Maternal nutritional status and child feeding practices: a retrospective study in Santal communities, Birbhum District, West Bengal, India. International Breastfeeding Journal. 2020 Dec;15(1):1-24.
9. Dhami MV, Ogbo FA, Osuagwu UL, Agho KE. Prevalence and factors associated with complementary feeding practices among children aged 6–23 months in India: a regional analysis. BMC public health. 2019 Dec;19(1):1-6.
10. Javalkar SR. Assessing WHO's IYCF Indicators in Mangalore Taluk-A Cross sectional Study. Indian J. Public Health Res. Dev. 2019 Jun;10:76-80.
11. Progress and inequalities in infant and young child feeding practices in India between 2006 and 2016 - Nguyen - 2018 - Maternal & Child Nutrition - Wiley Online Library. Accessed on Feb 3, 2025. Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/mcn.12663
12. Jeyakumar A, Babar P, Menon P, Nair R, Jungari S, Tamboli A, et al. Is Infant and Young Child-feeding (IYCF) a potential double-duty strategy to prevent the double burden of malnutrition among children at the critical age? Evidence of association from urban slums in Pune, Maharashtra, India. PLOS ONE. 2022 Dec 1;17(12):e0278152.
13. Khandelwal S, Kondal D, Chakravarti AR, Dutta S, Banerjee B, Chaudhry M, Patil K, Swamy MK, Ramakrishnan U, Prabhakaran D, Tandon N. Infant Young Child Feeding Practices in an Indian Maternal–Child Birth Cohort in Belagavi, Karnataka. International Journal of Environmental Research and Public Health. 2022 Apr 22;19(9):5088.
14. Varma P, Mohandas A, Vara Prasad KS, Mathur N, Balakrishna N, Pattnaik S. Infant and Young Feeding Practices Regarding Under-Nutrition Prevalence in Shamirpet Mandal, Hyderabad, India. International Journal of Nutrition Sciences. 2022 Dec 1;7(4):195-202.
15. Ishwarji MI, Rao KM, Ramakrishna KS, Kumar RH, Venkaiah K, Laxmaiah A. Care practices during pregnancy, infant feeding practices and their association with nutritional status of infants in Gujarat, India. Indian Journal of Community Health. 2018 Sep 30;30(3):202-12.
16. Pradhan I, Kandapan B, Pradhan J. Age-appropriate feeding practices and their association with undernutrition among children aged 6–23 months in aspirational districts of India: a multinomial analysis. Journal of Biosocial Science. 2023 Jan;55(1):1-21.
17. Dey D, Jana A, Pradhan MR. Influence of agriculture on child nutrition through child feeding practices in India: A district-level analysis. Plos one. 2021 Dec 16;16(12):e0261237.