J Nepal Health Res Counc 2025 Oct-Dec; 23 (69):619-625

Knowledge And Attitudes Regarding Infant Feeding and Immunization among Pregnant Women Visiting Antenatal Clinics

Santosh Adhikari,[1] Tribhuwan Bhattarai,[2] Prakriti Karki,[1] Kshitij Kunwar,[3] Ramesh Dhakal,[1] Lok Raj Bhatta,[4] Sabin Rimal,[5] Manisha Gaire,[6] Raj Kumar Nepal,[7] Srijana Bhattarai,[3] Praveen Suthar[8]

[1]Shankarapur Hospital Pvt. Ltd, Kathmandu, Nepal, [2]Province Hospital, Karnali Province, Surkhet, [3]Research and Innovation Foundation Nepal, [4]Epidemiology and Disease Control Divison, Kathmandu, [5]Kanti Children's Hospital, Kathmandu, [6]Chitwan Medical College, Bharatpur, [7]District Hospital, Sankhuwasabha, [8]Parul University, India.

ABSTRACT

Background: Deficits in maternal knowledge and perceptions can lead to suboptimal infant feeding and incomplete immunization, impacting child health. Given a lack of recent data in culturally diverse Eastern Kathmandu, this study explores pregnant women's knowledge and attitudes regarding infant feeding and immunization.

Methods: A cross-sectional study was conducted among pregnant women at antenatal clinics in Eastern Kathmandu (Feb-Mar 2025). Data were collected via a validated, self-administered questionnaire after informed consent. Multivariable logistic regression identified predictors of knowledge and attitudes on infant feeding and immunization. Statistical significance was set at $p < 0.05$.

Results: A total of 371 pregnant women participated. There was high knowledge gap in infant feeding practice 208 (56.1%) and high knowledge in immunization 277 (74.7%). Positive attitudes were observed in 341 (93.2%) intending to exclusively breastfeed and 369 (98.4%) believing immunization is safe. Lower knowledge was linked to younger age (<21 years; AOR 0.27, 95% CI 0.07–0.78) and lack of formal education (AOR 0.22, 95% CI 0.03–0.97 for feeding; AOR 0.11, 95% CI 0.03–0.39 for immunization). Positive attitudes were more common among homemakers (AOR 4.86, 95% CI 2.44–9.93) and women with higher parity (AOR 6.14, 95% CI 2.60–15.61 for third or higher).

Conclusions: The study reveals a significant gap in knowledge regarding infant feeding practices, especially among younger and less educated pregnant women in Eastern Kathmandu. Although attitudes are positive, targeted interventions are needed to address knowledge gaps, especially regarding exclusive breastfeeding.

Keywords: Attitude; immunization; infant feeding; knowledge; pregnant women.

INTRODUCTION

Children are central to national development, making their health a key priority in Nepal's public health agenda. Government efforts like immunization and nutrition programs support child survival and growth, with practices such as early breastfeeding, exclusive breastfeeding, complementary feeding, and timely immunization.[1] However, maternal knowledge and attitudes greatly influence these behaviors.[2] In culturally diverse population—home to urban and peri-urban populations—understanding maternal perceptions is essential. Although many pregnant women recognize the benefits of breastfeeding and immunization, gaps remain due to cultural beliefs, misinformation, and limited healthcare access.[3,4] Despite WHO recommendations, exclusive breastfeeding rates remain low, with early introduction of alternative feeds being common.[5] Similarly, immunization coverage is hindered by fear, misinformation, and accessibility challenges, despite free services. Education, cultural norms, healthcare access, and family influence all shape maternal practices.[6] This study explores the knowledge, attitudes, and barriers among pregnant women to inform targeted maternal and child health interventions.

Correspondence: **Dr Santosh Adhikari, Shankarapur Hospital Pvt. Ltd, Kathmandu, Nepal. Email: drsantoshadhikari2009@gmail.com, Phone. +9779869398751.**

METHODS

This prospective, cross sectional quantitative descriptive study was done by collecting the data in Antenatal clinics in eastern Kathmandu from February 2025 to March 2025 after getting the ethical clearance (Ref: PIPH/FOM/PU/2025/26) from IRB and support letter from the hospital administration. The ethical guidelines were followed like voluntariness, written informed consent, confidentiality, and "do no harm". A convenience sampling technique was used to enroll participants. The sample size was calculated using a population proportion formula based on a previous study by Bimpong et al., which reported a 68% knowledge prevalence.[7] With a 95% confidence level and a 5% margin of error, the final sample size was determined to be 371 after accounting for a 10% non-response rate. A pre-tested, expert-validated questionnaire was used to collect data. The tool, which consisted of five sections, was administered by trained staff through face-to-face interviews. Participants who were literate were also given the option to fill up the self-administered questionnaire.

Data were coded and entered into Microsoft Excel before being analyzed using SPSS version 25. Descriptive statistics (frequencies, percentages, and means) were used to summarize the study population's characteristics. Chi-square tests were performed to assess associations between categorical variables. Multivariable binary logistic regression was then conducted to identify independent predictors of knowledge and attitudes, with results reported as Adjusted Odds Ratios (AORs) with 95% Confidence Intervals (CIs). A p-value < 0.05 was considered statistically significant. Composite scores were calculated by summing correct responses for each knowledge and attitude domain. For knowledge, a median split of the scores was used to classify participants as having "Higher" or "Lower" knowledge. For attitudes, a total score (0-6) was classified using a criterion-based approach: scores of 3-4 were 'Negative,' a score of 5 was 'Neutral,' and a score of 6 was 'Positive.'

RESULTS

The study provides a comprehensive analysis of the sociodemographic characteristics, knowledge, practices, and attitudes of 371 pregnant women regarding infant feeding and immunization.

The demographic profile of the study participants is detailed in Table 1. The majority of the women were between 21-30 years of age 246 (66.3%). Education levels varied, with most participants having completed up to grade 12 (39.1%) or grade 8 (36.1%). Over half of the women were homemakers 244 (65.8%). Ethnically, the largest groups were Janjati 150 (40.4%) and Brahmin/Chhetri 122 (32.9%). The majority of women were either expecting their first 152 (41.0%) or second 156 (42.0%) child.

Table 1. Sociodemographic characteristics of the participants.

Category	Number (%)
Age Group	
less than 21	43 (11.6)
21-30	246 (66.3)
More than 30	82 (22.1)
Education Level	
No Formal Education	23 (6.2)
Up to 8th Grade	134 (36.1)
Up to 12th Grade	145 (39.1)
Bachelor and Above	69 (18.6)
Employment Status	
Homemaker	244 (65.8)
Employed (Part-time/Full-time)	66 (17.8)
Self-employed	39 (10.5)
Studying	22 (5.9)
Social Class	
Brahmin/Chhetri	122 (32.9)
Dalit	79 (21.3)
Janjati	150 (40.4)
Madhesi	9 (2.4)
Muslim	4 (1.1)
Others	7 (1.9)
Parity	
First	152 (41.0)
Second	156 (42.0)
Third	55 (14.8)
Four or More	8 (2.2)

Knowledge of infant feeding and immunization practices among participants is presented in Table 2 and Table 3. Awareness of exclusive breastfeeding was high, with 232 (62.5%) of women having heard of it, though a significant portion 105 (28.3%) were unsure of the correct six-month duration. Participants demonstrated a very high understanding of complementary feeding, with 356 (96.0%) correctly identifying the recommended starting time as after six months.

Table 2: Knowledge of the participants on Infant feeding.		
Question	**Answer**	**Number (%)**
Have you heard about exclusive breastfeeding (EBF)?	Yes	232 (62.5)
	No	139 (37.5)
How long should exclusive breastfeeding ideally last?	0-3 months	13 (3.5)
	4-6 months	157 (42.3)
	More Than 6 months	96 (25.9)
	Don't Know	105 (28.3)
When should complementary foods be introduced to an infant?	After 6 months	356 (96.0)
	At birth	4 (1.1)
	Don't know	11 (2.9)
When should cow or buffalo milk be given to children?	After 12 months	149 (40.1)
	After 6 months	122 (32.9)
	From birth	25 (6.7)
	Don't know	75 (20.2)
What are the benefits of breastfeeding? (Multiple selections)	Promotes bonding between mother and child	161 (43.4)
	Provide immunity to the child	294 (79.2)
	Reduces the mother's risk of certain illness	47 (12.7)
	Don't know	51 (13.7)

Knowledge of immunization was found to be exceptionally high, with 339 (91.7%) of participants having heard about infant immunization. Similarly, a majority 212 (57.1%) knew the recommended government immunization schedule. More than half, 219 (59.9%) reported to know the name of one or more disease prevented by the use of vaccine.

Table 3. Knowledge of study participants on Child Immunization.		
Question	**Answer**	**Number (%)**
Have you heard about infant immunization?	Yes	339 (91.7)
	No	32 (8.6)
Do you know the recommended schedule for infant immunization provided by the government?	Yes	212 (57.1)
	No	159 (42.9)
What are the benefits of immunization? (Multiple selections)	Boosts the immune system	285 (76.8)
	Causes more harm than Benefit	6 (1.6)
	Prevents serious illness	183 (49.3)
	Don't Know	34 (9.1)
What is the first vaccine to be given to children after birth in Nepal?	BCG	258 (69.4)
	Measles	10 (2.7)
	Polio	40 (10.7)
	Typhoid	1 (0.3)
	Don't know	62 (16.7)
Can you name at least one disease that can be prevented by immunization?	Yes	219 (59.9)
	No	152 (40.1)
If yes, please specify what disease is prevented by immunization. (Multiple response possible)	Measles	102 (46.6)
	Polio	75 (34.2)
	Tuberculosis	49 (22.3)
Others (BCG, Typhoid, Pneumonia, Hepatitis, Hepatitis B, Malnutrition, Rubella, Smallpox, Tetanus, Meningitis)		30 (13.7)

The attitudes of the pregnant women toward infant feeding and immunization were largely positive, as detailed in Table 4. The results showed a strong intention to breastfeed, with 341 (93.2%) of women intending to exclusively breastfeed their baby. Confidence in their ability to do so was also high, with 249 (67.2%) feeling "very confident." In terms of immunization, an overwhelming majority of participants 369 (98.4%) believed that vaccines are safe for infants, and 365 (97.2%) would seek medical advice if a scheduled vaccine was missed.

Table 4. Attitude of study participants on Infant feeding and Immunization.

Question	Answer	Number (%)
Do you intend to exclusively breastfeed your baby?	Yes	341 (93.2)
	Not sure	22 (6.0)
	No	8 (2.2)
How confident are you in your ability to breastfeed exclusively?	Very confident	249 (67.2)
	Somewhat confident	104 (28.0)
	Not confident	18 (4.8)
Do you believe that immunization is safe for infants?	Yes	369 (98.4)
	No	2 (0.5)
Would you seek medical advice if your child missed a scheduled vaccine?	Yes	365 (97.2)
	No	6 (1.6)
What will you give for complementary feeding to your infant?	Lito (local food)	270 (72.6)
	Rice and Vegetables	87 (23.4)
	Fruits	10 (2.7)
	Biscuits and Breads	4 (1.1)

The most significant influence on their decisions about infant feeding and immunization was healthcare professionals, cited by 298 (79.9%) of the women. The challenge anticipated was the lack of space for public breastfeeding, availability of health facilities and inadequate breast milk expression.

Table 5. Attitude of study participants on Infant feeding and Immunization.

Question/Influence	Answer	Number (%)
What influences your decisions about infant feeding and immunization?	Cultural or religious beliefs	58 (15.6)
	Media and social media	68 (18.3)
	Family and friends	146 (39.3)
	Healthcare professionals	298 (79.9)
Do you perceive breastfeeding in public as comfortable?	Comfortable	96 (25.6)
	Somewhat uncomfortable	225 (60.7)
	Very uncomfortable	50 (13.4)
Do you believe vaccines have side effects that outweigh their benefits?	No	280 (74.5)
	Yes	91 (24.3)
Are there any challenges you anticipate in breastfeeding or immunizing your child?	No	348 (93.8)
	Yes	23 (6.2)
If yes, please specify the challenges	Fever after immunization	1 (0.3)
	Lack of women health programs	1 (0.3)
	Pain during pricking	1 (0.3)
	Health facility availability	6 (1.6)
	Inadequate breast milk expression	6 (1.6)
	Lack of space in public places / during travel	7 (1.9)
	None	349 (94.1)

The study revealed that 277 (74.7%) of participants had a low level of knowledge about infant feeding practices, indicating a need for targeted educational interventions. In contrast, knowledge about immunization was found to be higher, with over half of the women 208 (56.1%) having a high level of knowledge. Regarding attitudes, the results were overwhelmingly positive. A significant majority of participants 242 (65.2%) expressed a positive attitude toward infant feeding and immunization.

Table 6 examines the factors associated with knowledge and attitudes toward infant feeding and immunization using adjusted odds ratios (AOR) with 95% confidence intervals (CI). Younger age (<21 years) was significantly associated with lower knowledge of infant feeding (AOR 0.27, 95% CI 0.07-0.78) and less positive attitudes (AOR 0.21, 95% CI 0.09-0.50). No formal education was linked to lower knowledge of both feeding (AOR 0.22, 95% CI 0.03-0.97) and immunization (AOR 0.11, 95% CI 0.03-0.39). Homemakers and students showed significantly more positive attitudes (AOR 4.86, 95% CI 2.44-9.93, and AOR 3.12, 95% CI 1.01-10.11, respectively). Higher parity (second or third+) was associated with more positive attitudes (AOR 2.96, 95% CI 1.68-5.27, and AOR 6.14, 95% CI 2.60-15.61, respectively). The Nagelkerke R^2 values (0.10 for feeding knowledge, 0.18 for immunization knowledge, and 0.31 for attitudes) indicate the proportion of variance explained by these factors.

Table 6. Factors Associated with Knowledge and Attitude toward Infant Feeding and Immunization.

Variable	Categories	Knowledge on Infant Feeding		Knowledge on Immunization		Attitude	
		AOR (95% CI)	p-value	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Age	21-30 years	1 [Ref]		1 [Ref]		1 [Ref]	<0.01*
	<21 years	0.27 (0.07-0.78)	0.036*	0.79 (0.33-1.79)	0.034*	0.21 (0.09-0.50)	
	>30 years	0.96 (0.50-1.79)		0.99 (0.55-1.77)		1.14 (0.59-2.26)	
Education	Bachelor and Higher	1 [Ref]		1 [Ref]		1 [Ref]	0.063
	No Formal Education	0.22 (0.03-0.97)	0.003*	0.11 (0.03-0.39)	<0.001*	0.56 (0.15-2.31)	
	Up to Grade 8	0.52 (0.23-1.15)		0.27 (0.13-0.58)	<0.001*	0.35 (0.15-0.79)	
	Up to Grade 12	0.75 (0.38-1.48)		0.54 (0.27-1.05)		1.02 (0.47-2.16)	
Employment	Employed	1 [Ref]		1 [Ref]		1 [Ref]	<0.01*
	Homemaker	0.74 (0.38-1.43)	0.149	0.82 (0.44-1.53)	<0.01*	4.86 (2.44-9.93)	
	Self-employed	0.72 (0.28-1.78)		0.38 (0.16-0.90)		2.29 (0.93-5.80)	
	Studying	0.70 (0.19-2.25)		0.19 (0.05-0.61)		3.12 (1.01-10.11)	
Ethnicity	Brahmin/Chhetri	1 [Ref]		1 [Ref]		1 [Ref]	0.053
	Janajati	1.12 (0.63-2.00)	0.034*	0.89 (0.52-1.52)	<0.01*	0.81 (0.43-1.50)	
	Others	0.64 (0.30-1.31)		0.51 (0.27-0.95)		0.65 (0.33-1.31)	
Parity	First Pregnancy	1 [Ref]		1 [Ref]		1 [Ref]	<0.01*
	Second Pregnancy	0.61 (0.35-1.07)	0.538	1.32 (0.78-2.24)	0.283	2.96 (1.68-5.27)	
	Third or Higher	0.78 (0.34-1.72)		1.48 (0.71-3.12)		6.14 (2.60-15.61)	

Note: AOR: Adjusted Odds Ratio, CI: Confidence Interval, Ref: Reference Category, *p-value < 0.05

The findings of this study demonstrate that while there is high awareness and a largely positive attitude toward immunization among pregnant women in Kathmandu (reflecting successful public health efforts in this area), their knowledge of infant feeding practices remains a significant concern. The demographic analysis revealed a young, educated, and primarily homemaker study population, whose knowledge and attitudes were strongly influenced by factors like age, education, employment status, trust in healthcare professionals and parity.

DISCUSSION

This study provides critical insights into the perceptions of knowledge and attitudes toward infant feeding and immunization among pregnant women in Eastern Kathmandu. This study highlights a significant disparity in maternal

knowledge between infant feeding and immunization. While participants demonstrated high knowledge of immunization, their understanding of infant feeding, especially the recommended duration of exclusive breastfeeding (EBF), was notably low. Although 62.5% of participants had heard of EBF, only 42.3% correctly identified its six-month duration. This finding aligns with trends in South Asia and other low- and middle-income countries (LMICs), where maternal health knowledge is often fragmented due to reliance on informal and sometimes inaccurate sources.[8,9]

In contrast, immunization knowledge was more robust, likely due to successful public health campaigns and urban exposure, compared to rural regions in Pakistan and India.[10] This highlights the need for culturally sensitive, evidence-based health education.

Interestingly, despite the knowledge gap, 93.2% of mothers expressed an intention to exclusively breastfeed. This disconnect between knowledge and behavior mirrors findings from other studies, indicating that positive attitudes, while prevalent, do not necessarily translate into correct practice without adequate support and access to reliable information.[11] Lower education and younger age were associated with lower knowledge, consistent with a body of literature that links formal education and experience with better health outcomes.[10,12] Additionally, parity emerged as a significant predictor of positive attitudes, suggesting that the experience and support systems from prior pregnancies may foster greater confidence.

Around 39.3% of participants cited family and friends as their primary source of information, a finding consistent with other studies in Nepal and India.[13,3] Discomfort with public breastfeeding, reported by over 74% of participants, highlights ongoing social taboos that can act as barriers to best practices.[14] Finally, systemic barriers and misinformation, particularly via social media, were identified as growing concerns.[15] This underscores the need for standardized, culturally appropriate, and digitally accessible health education to counter misinformation and improve service delivery.[16]

This study highlights the critical need to address social, cultural, and systemic barriers that prevent positive intentions from translating into optimal health behaviors. The findings underscore the importance of integrating context-specific, culturally informed education into routine healthcare to improve maternal and child health outcomes.

However, as a cross-sectional study, it cannot establish causal relationships. Additionally, the findings are limited to pregnant women in a specific region of Kathmandu, which may affect their generalizability to the broader population of Nepal

CONCLUSIONS

The findings reveal a significant disparity in knowledge: while participants demonstrated a high level of knowledge about immunization, their understanding of infant feeding, particularly the duration of exclusive breastfeeding, was notably low. Despite this knowledge gap, the overall attitude toward both health practices were overwhelmingly positive. The multivariable analysis confirmed that sociodemographic factors such as age, educational level, employment status, and parity are key determinants of these outcomes.

ACKNOWLEDGMENTS

We acknowledge the contributions of Santoshi Karki, Rukmini Shrestha, and Anita Pandey for their assistance in data collection, as well as the pregnant women who participated in this study.

CONFLICT OF INTEREST

None

REFERENCES

1. Acharya P, Khanal V. The effect of mother's educational status on early initiation of breastfeeding: further analysis of three consecutive Nepal Demographic and Health Surveys. BMC Public Health. 2015 Oct 19;15(1):1069.doi: https://doi.org/10.1186/s12889-015-2405-y

2. Adhikari M, Khanal V, Karkee R, Gavidia T. Factors associated with early initiation of breastfeeding among Nepalese mothers: further analysis of Nepal Demographic and Health Survey, 2011. International breastfeeding journal. 2014 Dec 5;9(1):21.doi: https://doi.org/10.1186/s13006-014-0021-6

3. Adhikari S, Chapagain RH, Maharjan J, Kunwar K, Pudasaini S, Singh P, et al. Acceptance of new respiratory syncytial virus vaccine among pregnant women in nepal for future routine immunization: a descriptive cross-sectional study. JNMA: Journal of the Nepal Medical Association. 2024 Jun 30;62(274):372.doi: https://doi.org/10.31729/

jnma.8622

4. Elias AH, Feleke GW, Muluken BS. Colostrum Avoidance Practices and Its Associated Factors among Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2020. A Community Based Cross Sectional Study. *Health Services Research and Managerial Epidemiology*, *9*, 23333928221106056. doi: https://doi.org/10.1177/23333928221106056

5. WHO. *Infant and young child feeding*.(2023, December 20). https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding

6. Ahmed HM, Piro SS. Knowledge and attitudes of pregnant women regarding breastfeeding. Polytechnic Journal. 2019;9(2).doi: https://doi.org/10.25156/ptj.v9n2y2019.pp55-62

7. Bimpong KA, Cheyuo EK, Abdul-Mumin A, Ayanore MA, Kubuga CK, Mogre V. Mothers' knowledge and attitudes regarding child feeding recommendations, complementary feeding practices and determinants of adequate diet. BMC nutrition. 2020 Dec 1;6(1):67. doi: https://doi.org/10.1186/s40795-020-00393-0

8. Khanal V, Adhikari M, Sauer K, Zhao Y. Factors associated with the introduction of prelacteal feeds in Nepal: findings from the Nepal demographic and health survey 2011. International breastfeeding journal. 2013 Aug 8;8(1):9. doi: https://doi.org/10.1186/1746-4358-8-9

9. Verma D, SinghS K. Knowledge, attitude and practices regarding infant feeding among mothers of children with severe acute malnutrition in the rural areas of Northern India. *Pediatric Review: International Journal of Pediatric Research* , (2021) *8*(3), 137-145.doi: https://doi.org/10.17511/ijpr.2021.i03.03

10. Kumail S, Nafeesa B K, RaheelR, & Ahmed S. *Original Article Knowledge, Attitude and Practices of Pregnant Women regarding Benefits of Breast Feeding and Immunization in newborns*. (2018). Unpublished. doi: https://doi.org/10.13140/RG.2.2.10915.30241

11. Piro SS, Ahmed HM. Impacts of antenatal nursing interventions on mothers' breastfeeding self-efficacy: an experimental study. BMC Pregnancy Childbirth. 2020 Jan 6;20(1):19. doi: 10.1186/s12884-019-2701-0. PMID: 31906881; PMCID: PMC6945460.

12. Balbir Singh HK, Badgujar VB, Yahaya RS, Abd Rahman S, Sami FM, Badgujar S, Govindan SN, Ansari MT. Assessment of knowledge and attitude among postnatal mothers towards childhood vaccination in Malaysia. Human vaccines & immunotherapeutics. 2019 Nov 2;15(11):2544-51. doi: https://doi.org/10.1080/21645515.2019.1612666

13. Bhandari S, Thorne-Lyman AL, Shrestha B, Neupane S, Nonyane BA, Manohar S, Klemm RD, West Jr KP. Determinants of infant breastfeeding practices in Nepal: a national study. International breastfeeding journal. 2019 Apr 3;14(1):14. doi: https://doi.org/10.1186/s13006-019-0208-y

14. Shrestha S, Pokhrel M, Mathema S. Knowledge, attitude and practices among mothers of children 6 to 24 months of age regarding complementary feeding. JNMA: Journal of the Nepal Medical Association. 2020 Oct 31;58(230):758.doi: https://doi.org/10.31729/jnma.5274

15. Dubé E, Laberge C, Guay M, Bramadat P, Roy R, Bettinger JA. Vaccine hesitancy: an overview. Human vaccines & immunotherapeutics. 2013 Aug 8;9(8):1763-73. doi: https://doi.org/10.4161/hv.24657

16. Lassi ZS, Kumar R, Bhutta ZA. Community-based care to improve maternal, newborn, and child health. https://europepmc.org/article/nbk/nbk361898