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Influence of Maternal and Child Health Practices on Nutritional Status of Under-Five Children in Urban Slums of Odisha, India

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Abstract

Introduction: Maternal and child health (MCH) practices are critical determinants of child growth and nutritional outcomes, particularly in urban slum settings where socioeconomic and environmental vulnerabilities persist. Despite improved service coverage in India, undernutrition among under-five children remains a major public health concern.

Objectives: This study aimed to assess maternal and child health practices and examine their association with the nutritional status of children under five years of age in urban slums of Sambalpur District, Odisha.

Methods: A community-based cross-sectional analytical study was conducted among 550 children aged 6 months to 5 years during 2022–2023. Data on sociodemographic characteristics, maternal and child health practices, breastfeeding, and complementary feeding were collected using a pre-tested structured questionnaire. Anthropometric measurements were taken to assess wasting, stunting, and underweight. Statistical analysis was performed using SPSS version 23. Associations were examined using Chi-square tests, and multivariable logistic regression analysis was applied to identify predictors of malnutrition, with statistical significance set at $p < 0.05$.

Results: Most children were first or second born, fully immunized, and delivered in health institutions. Colostrum feeding was widely practiced; however, delayed initiation of breastfeeding, early discontinuation, poor feeding hygiene, and inappropriate complementary feeding were common. Multivariable analysis revealed that home delivery (AOR = 5.17) and absence of colostrum feeding (AOR = 2.87) were significantly associated with stunting. Early initiation of breastfeeding (<2 hours) showed a protective effect against wasting, stunting, and underweight. Other maternal and child health practices showed limited associations, indicating the multifactorial nature of childhood malnutrition.

Conclusions: Although coverage of maternal and child health services was high, suboptimal infant and young child feeding practices persist and contribute to undernutrition. Strengthening behavior change communication, promoting early breastfeeding initiation, appropriate complementary feeding, and hygienic practices are essential to improve child nutritional outcomes in urban slum populations.

Keywords: Nutritional status, Breastfeeding practices, Complementary feeding, Urban slums, Under-five children, Maternal and child health;

1. Introduction

Maternal and child health (MCH) practices constitute a fundamental pillar of public health, encompassing the comprehensive care provided to women during the reproductive cycle and to children during their most vulnerable developmental stages (World Health Organization, 2023). These practices—ranging from antenatal surveillance and skilled birth attendance to postnatal care and optimal infant and young child feeding (IYCF)—are critical determinants of long-term population health. The "first 1,000 days" of life are widely recognized as a "window of opportunity," where maternal nutritional status and caregiving practices directly influence a child's lifelong physical and cognitive trajectory (Black et al., 2013). Consequently, MCH indicators serve as a sensitive proxy for the overall efficacy of a nation's healthcare delivery system and its progress toward achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 3, which targets the end of preventable neonatal and under-five mortality.

Despite India's significant strides in maternal and child survival, the National Family Health Survey (NFHS-5) reveals persistent disparities in nutritional outcomes, particularly within the urban-poor demographic (IIPS & ICF, 2021). Rapid, unplanned urbanization has led to the proliferation of slum settlements, where overcrowding, inadequate sanitation, and food insecurity create a hostile environment for child growth (Agarwal, 2011). In the state of Odisha, while statewide health metrics have improved through targeted interventions over the last 25 years (Menon et al., 2016), specific regional challenges remain. Recent

research by Kumari et al. (2024) highlights that children in the urban slums of Sambalpur continue to face significant nutritional deficits, underscoring the need for localized, community-specific data to bridge the gap between policy and practice.

The necessity of this research stems from the "urban paradox," where proximity to health facilities in cities does not necessarily translate to better health outcomes for slum dwellers due to socioeconomic barriers and lack of health literacy (Thakur et al., 2025). Previous studies in similar Indian contexts have shown that the prevalence of stunting and wasting is often exacerbated by poor maternal health practices and inadequate utilization of community-based services like the Anganwadi system (Sahoo et al., 2020). Furthermore, the specific dynamics of health-seeking behavior in the slums of Western Odisha remain under-explored (Tripathy et al., 2017).

This study aims to evaluate the impact of maternal and child health practices on the nutritional status of children under five in the Sambalpur District. By building upon the foundational growth pattern assessments established by Kumari et al. (2025), this research seeks to identify the specific maternal factors—such as exclusive breastfeeding and hygiene practices—that serve as predictors for childhood malnutrition. The significance of this work lies in its potential to inform evidence-based, mother-centric interventions that can break the intergenerational cycle of malnutrition and contribute to the realization of a Malnutrition-Free India.

2. Objectives

1. To study the maternal and child health practices in the study area.
2. Impact of maternal & child health practices on the nutritional status.

3. Methods

This community-based, cross-sectional analytical study was conducted between 2022 and 2023 within the urban slum settlements of the Burla and Hirakud blocks in the Sambalpur District of Odisha, India. The study population consisted of children aged 6 months to 5 years who were registered as permanent residents in local Anganwadi records. To ensure data integrity, inclusion was limited to children residing permanently with their families whose mothers provided informed consent, while children with severe acute illnesses or those unavailable after two consecutive home visits were excluded. The sample size was determined using the formula $N = 4PQ/L^2$; assuming a 50% prevalence (P) of anemia among children under five and an allowable error (L) of 5%, a minimum requirement of 400 participants was identified. To improve the study's robustness, this was increased to a final sample of 550. A multistage sampling strategy was employed, beginning with the purposive selection of slums followed by systematic random sampling of households. To mitigate clustering bias, only one child was randomly selected from households containing multiple eligible participants. Data collection was performed by the primary investigator using a structured, pre-tested questionnaire, the reliability of which was established through a pilot study of 80 children. The instrument gathered comprehensive data on sociodemographic characteristics, maternal and child health history, and specific feeding practices. Anthropometric assessments, including weight, height, and mid-upper arm circumference (MUAC), were recorded using a standardized weighing scale, an infantometer, and a non-stretchable measuring tape. Statistical analysis was conducted using SPSS Version 23. Descriptive data were summarized as frequencies, percentages, or means with standard deviations. The Chi-square test was utilized to explore associations between exclusive breastfeeding and categorical variables, while regression analysis was performed to determine the impact of maternal and child health practices on nutritional status. Statistical significance was defined as $p < 0.05$.

4. Results

The results demonstrate notable variations in maternal and child health practices related to birth spacing, antenatal care, delivery, breastfeeding, and weaning, with clear associations observed with the nutritional status of children. These findings highlight the importance of comprehensive maternal and child health practices in improving child nutrition outcomes in slum populations.

Table 1: Distribution of respondents based on ordinal position, birth spacing and immunization.

Particulars	Boys	Girls	Total	χ^2	P value
	f (%)	f (%)	f (%)		
Ordinal position					
First	138	136	274	0.87	0.833

	(50.4)	(49.6)	(49.8)		
Second	90 (46.4)	104 (53.6)	194 (35.3)		
Third	26 (47.3)	29 (52.7)	55 (10)		
Other	14 (51.9)	13 (48.1)	27 (4.9)		
Birth spacing (n=276)					
1Y	8 (42.1)	11 (57.8)	19 (3.5)	1.72	0.787
2Y	41 (43.6)	53 (56.4)	94 (17)		
3Y	26 (51)	25 (49)	51 (9.3)		
>3Y	55 (49.1)	57 (50.9)	112 (20.4)		
Immunization status					
Complete up to age	243 (47.9)	264 (52.1)	507 (92.2)	1.65	0.198
Incomplete	25 (58.1)	18 (41.9)	43 (7.8)		

Table 1 showed that the majority (49.8%) of respondents were first-born children, followed by second-born children (35.3%), third-born children (10%), and others (4.9%). There was no significant association in the distribution of ordinal positions between boys and girls. It was noted that 19% children had a birth spacing of 1 year, 17% had birth spacing of 2 years, 9.3% had birth spacing of 3 years, and 20.4% had birth spacing greater than 3 years. There were no significant differences in birth spacing based on gender. Majority (92.2%) of respondents were found to be fully immunized up to their age, while 7.8% had incomplete immunization. There was no significant association in immunization status between boys and girls. While the majority of children were fully immunized, efforts are needed to ensure universal access to immunization services and address barriers to completion.

David S.M. et al (2020) conducted a study on risk factors for severe acute malnutrition among children aged 6-59 months: which revealed that majority (94.3%) children were completely immunized. Another study conducted by **Roy K. et al. (2018)** revealed that 49.3% children were in first, 47.9% in second & 2.8% were in ≥ 3rd birth order.

Table No. 2-Distribution of respondents based on birth spacing between children.

Birth spacing	Spacing between 1st & 2nd child	Spacing between 2nd & 3rd child	Spacing between 3rd & other child	χ^2	P value
	f (%)	f (%)	f (%)		
1yr	13 (6.7)	4 (7.2)	2 (7.4)	17.45	0.008*
2yr	73 (37.6)	9 (16.3)	12 (44.4)		
3yr	34 (17.5)	10 (18.1)	7 (25.9)		
>3yr	74 (38.1)	32 (58.1)	6 (22.2)		

* Significant

The analysis of birth spacing revealed that the majority of families (37.6%) spaced their second child two years apart from the first, while 38.1% spaced their subsequent children more than three years apart. Notably, only 6.7% of families had a one-year gap between the first and second child, indicating a preference for longer spacing. In the case of the second and third children, only 16.3% had a two-year gap, with a significant 58.1% spacing them by more than three years. These findings suggest that longer birth intervals are common, which may reflect a trend towards deliberate family planning among parents. The Chi-square test indicated a significant association between birth spacing and the number of children, highlighting the importance of spacing in family dynamics.

Table 3. Distribution of respondents based on antenatal checkup, type and place of delivery.

Particulars	**Boys** f (%)	**Girls** f (%)	**Total** f (%)	**χ^2**	**P-value**
Antenatal check-up					
Yes	261 (48.2)	281 (51.8)	542 (98.5)	4.88	0.027
No	7 (87.5)	1 (12.5)	8 (1.5)		
ANC visit (N=542)					
1 to 3 time	50 (46.7)	57 (53.3)	107 (19.7)	6.0	0.199
4 to 5 time	169 (48)	183 (52)	352 (64.9)		
>5 time	42 (50.6)	41 (49.4)	83 (15.3)		
Mode of delivery					
Normal	206 (47.5)	228 (52.5)	434 (78.9)	1.31	0.252
Cesarean	62 (53.4)	54 (46.6)	116 (21.1)		

Place of delivery					
Home delivery	14 (40)	21 (60)	35 (6.4)	1.14	0.286
Hospital delivery	254 (49.3)	261 (50.7)	515 (93.6)		

Table 3 provided information on antenatal care, the type of delivery and the place of delivery among the respondents. Almost all respondents (98.5%) received antenatal check-ups, with 48.2% of boys and 51.8% of girls attending these check-ups. There was a significant difference in the distribution of antenatal check-ups between boys and girls, indicating potential gender disparities in access to prenatal care. Among those who received antenatal check-ups (N=542), the majority (64.9%) had 4 to 5 visits, followed by 3 visits (19.7%) and >5 visits (15.3%). There were no significant differences in the distribution of ANC visits based on gender. The majority of deliveries were normal (78.9%), with 47.5% of boys and 52.5% of girls delivered through this mode. There were no significant differences in the mode of delivery between boys and girls. Most deliveries occurred in hospitals (93.6%), with 49.3% of boys and 50.7% of girls. There were no significant differences in the place of delivery between boys and girls. The findings revealed high rates of antenatal check-ups and hospital delivery among respondents, indicating relatively good access to prenatal care and institutional delivery services in the study population. Study conducted by **Gaidhane et al. (2021)** on "Determinants of stunting & wasting among the children under five years of age in rural India", revealed that 63.66% mothers had complete ANC checkup (recommended 5 visit) & 98.3% mothers were having institutional delivery which was similar to the findings of our study.

Table 4. Breast feeding practices.

Particulars	**f**	**%**
Fed colostrum		
Yes	513	93.3
No	37	6.7
Reason for discarding colostrums (n=37)		
Elders advise	18	48.6
Not digestible	7	18.9
Not good for child	12	32.4
First feed to the new born		
Only Colostrums	188	34.1
Colostrum+Water+Honey	232	42.1
Colostrum+Water+Honey+ Misri pani	21	3.8
Colostrums + Khairapani	19	3.4
Colostrums + water + honey +Khirapani	31	5.6
Colostrum +Water+Honey+Misri pani+Katha pani	22	4.0
Colostrum discarded and put to breast+Water+Honey+Misri pani	37	6.7
Initiation of breast feeding after birth		
< 2 hour	14	2.5
2-4 hour	316	57.5
4-6 hour	112	20.4
> 6 hour	108	19.6

Table 4 described the breastfeeding practices followed by the respondents.The majority of respondents (93.3%) reported feeding colostrum to their newborns, indicating a high level of adherence to this important infant feeding practice. However, a small proportion (6.7%) reported discarding colostrum, with reasons including elder's advice (48.6%), concerns about digestibility (18.9%), and beliefs that it's not good for the child (32.4%).

Various practices were reported for the first feed to newborns, with the most common being Colostrum+Water+Honey (42.1%), followed by only Colostrum (34.1%). Other combinations included Colostrum+Water+Honey+Misri pani (3.8%), Colostrums + Khairapani (3.4%), Colostrums + water + honey +Khirapani (5.6%), Colostrum +Water+Honey+Misri pani+Katha pani (4.0%), and Colostrum discarded and put to breast+Water+Honey+Misri pani (6.7%). The use of honey, khirapan, misri pani, and katha pani in newborn feeding practices can be attributed to traditional beliefs and cultural practices. The timings of breastfeeding initiation varied among respondents, with the majority (57.5%) initiating breastfeeding between 2-4 hours after birth. A smaller proportion-initiated breastfeeding within 4-6 hours (20.4%), > 6 hours (19.6%) and < 2 hours (2.5%), after birth. The findings reveal a high rate of colostrum feeding among respondents, indicating adherence to this important infant feeding practice. However, a small proportion reported discarding colostrum, primarily due to advice from elders and

concerns about digestibility and perceived harm to the child.

Table 5. Breast feeding practices of the mothers.

Particulars	f	%
Breast feeding continued		
Yes	261	47.5
No	280	50.9
Bottle feeding	9	1.6
Burping	N=270	
Yes	68	25.2
No	202	74.8
Frequency of feeding the child per day	N=270	
2-3 times	20	7.4
3-4 times	43	15.9
4-5 times	109	40.4
5-6 times	29	10.7
> 6 times	69	25.6
Schedule for feeding	N=270	
Strictly clockwise	11	4.1
Whenever baby shows sign for wanting	259	95.9
Feeding position	N=270	
Cradle hold	107	39.6
Cross-cradle hold	51	18.9
Side-lying position	112	41.5
Duration of breast feeding	N=270	
5-10min.	55	20.4
10-15min.	192	71.1
20min. & more	23	8.5
Maintenance of hygiene during feeding	N=270	
Yes	13	4.8
No	257	95.2

Table 5 presented the breastfeeding practices of the mothers. Less than half of the mothers (47.5%) reported continuing breastfeeding, while a slightly higher proportion (50.9%) had discontinued breastfeeding, and 1.6% practiced bottle feeding. Among mothers assessed for burping practices (N = 270), only 25.2% practiced burping after feeding, whereas the majority (74.8%) did not.

Regarding the frequency of feeding per day, 40.4% of mothers fed their children 4–5 times daily, followed by 25.6% who fed more than six times per day. Most mothers (95.9%) followed demand feeding, while only 4.1% adhered to a strict feeding schedule. With respect to feeding position, 41.5% used the side-lying position, 39.6% practiced the cradle hold, and 18.9% used the cross-cradle hold.

The duration of breastfeeding per session was predominantly 10–15 minutes among 71.1% of mothers, while 20.4% breastfed for 5–10 minutes and only 8.5% continued for 20 minutes or more. Maintenance of hygiene during feeding was notably poor, with only 4.8% of mothers reporting hygienic practices, compared to 95.2% who did not maintain hygiene during feeding. The study revealed suboptimal breastfeeding practices among mothers, with a high proportion discontinuing breastfeeding and poor adherence to recommended burping and hygienic feeding practices. Although demand feeding and appropriate feeding positions were commonly practiced, inadequate hygiene during feeding may increase the risk of infections and poor nutritional outcomes, findings consistent with earlier studies conducted in urban slum settings (Mishra et al., 2018; Patel et al., 2020; WHO, 2023).

Table 6. Distribution of respondents based on weaning practices.

Particulars	f	%
Infant weaning practices		
Yes	545	99
No	5	0.9
Consistency of food		
Liquid foods		
Dal water	43	7.8
Kanji	9	1.6
Tomato Juice	14	2.5
Sago porridge	7	1.3
Others	151	27.5
Semi Solid foods		
Rice+dal	460	83.6
Rice+Milk	67	12.2
Khichri	85	15.5
Solid foods		
Chapattis	80	14.5
Biscuits	445	80.9
Rice Cake	22	4.0
Others	7	1.3

Table 6 presented the weaning practices followed by the respondents. Almost all respondents (99%) reported practicing infant weaning, indicating a high prevalence of this feeding practice.

Regarding consistency of food, among liquid foods, the most commonly reported were Dal water (7.8%), followed by Tomato Juice (2.5%), Kanji (1.6%), Sago porridge (1.3%), and others (27.5%). Semi-solid foods were predominantly Rice+dal (83.6%), Khichri (15.5%),

and Rice+Milk (12.2%). Solid foods included Biscuits (80.9%), Chapattis (14.5%), Rice cake (4.0%), and others (1.3%). This pattern indicates a predominant preference for semi-solid and solid foods over liquid options in the weaning process. The findings indicate widespread adoption of infant weaning practices among respondents, with almost all reporting engaging in this feeding practice. Cultural preferences, parental familiarity with certain foods, and practical considerations in food preparation and availability also play significant roles in these choices.

Table 7. Distribution of respondents based on weaning food introduced at different age.

Weaning foods	Age in months (when introduced)			
	4-6 months	6-9 months	9-12 months	12-15 months
	f (%)	f (%)	f (%)	f (%)
Liquid foods				
Dal water	1 (0.2)	41 (7.5)	1 (0.2)	0
Kanji	0	9 (1.6)	0	0
Tomato Juice	1 (0.2)	12 (2.2)	1 (0.2)	0
Sago porridge	0	7 (1.3)	0	0
Others	0	151 (27.5)	0	0
Semi Solid foods				
Rice+dal	1 (0.2)	365 (66.4)	81 (14.7)	13 (2.4)
Rice+Milk	0	64 (11.6)	3 (0.5)	0
Khichri	0	74 (13.5)	11 2	0
Solid foods				
Chapattis	0	47 (8.5)	29 (5.3)	4 (0.7)
Biscuits	11 (2)	367 (66.7)	65 (11.8)	2 (0.4)
Rice Cake	0	21 (3.8)	0	1 (0.2)
Others	0	7 (1.3)	0	0

Table 7 illustrated the distribution of respondents based on the age at which weaning food was introduced to their children. Dal water (0.2%), Tomato Juice (0.2%), and Kanji (0%) were introduced to the infants aged 4-6 month. For infants aged 6-9 months, the introduction of liquid foods increased, with Dal water (7.5%), Tomato Juice (2.2%), Kanji (1.6%), and Sago porridge (1.3%) being reported. There was a decline in the introduction of liquid foods for infants aged 9-12 months, with only Dal water (0.2%), Tomato Juice (0.2%). The most common semi-solid food introduced across all age groups was Rice+dal, with percentages increasing from 0.2% (4-6 months) to 66.4% (6-9 months) and gradually decreasing thereafter. Other semi-solid foods like Rice+Milk and Khichri were also introduced, with varying percentages across different age groups. Biscuits were the most commonly introduced solid food, with percentages ranging from 2% (4-6 months) to 66.7% (6-9 months) and gradually decreasing thereafter. Chapattis and Rice Cake were introduced in smaller percentages across different age groups. The findings reveal a pattern of introducing a variety of weaning foods to infants across different age groups. These findings highlight the diversity in weaning practices and the importance of introducing a variety of nutritious foods to infants as they transition from exclusive breastfeeding or formula feeding to complementary feeding.

The study revealed a high prevalence of infant weaning practices, with most mothers introducing semi-solid foods such as rice with dal and khichri, similar to findings from earlier Indian studies (Aggarwal et al., 2018; Patel et al., 2020). However, the frequent use of biscuits as a weaning food deviated from recommended infant and young child feeding guidelines, as reported in previous research, highlighting the need for nutrition education on appropriate complementary feeding (WHO, 2023).

Table 8. Multivariable Logistic Regression Analysis of Maternal and Child Health Practices Associated with Nutritional Status of Children.

Variables	Category	Wasting	Stunting	Underwt.
		AOR	AOR	AOR
		(95% CI)		
Mode of Delivery	Normal	1.506 (.791-2.867)	1.029 (.566-1.871)	.933 (.51-1.705)
	Cesarean[b]	.	.	.
Place of Delivery	Home Delivery	.836 (.318-2.199)	5.170 (1.636-16.336)	1.602 (.633-4.054)
	Hospital Delivery[b]	.	.	.
Immuniza	Incom	.766	.201	.47

tion	plete	(.32-1.835)	(.073-.556)	(.212-1.045)
	Complete up to age[b]	.		
Birth Spacing	1 year	.854 (.254-2.876)	.632 (.228-1.753)	.525 (.193-1.428)
	2 year	.979 (.491-1.952)	.667 (.375-1.183)	.694 (.389-1.239)
	3 year	.854 (.376-1.942)	1.4 (.685-2.861)	1.085 (.519-2.268)
	>3 year[b]	.		
Colostrum Feeding	No	1.05 (.399-2.531)	2.87 (1.307-6.307)	.955 (.447-2.041)
	Yes[b]			
Initiation of Breast Feeding	< 2 hour	.521 (.13-2.081)	.334 (.094-1.191)	.422 (.120-1.489)
	2-4 hour	.996 (.459-2.159)	.812 (.394-1.671)	.913 (.440-1.891)
	4-6 hour[b]	.	.	.
Complementary Feeding	No	.632 (.347-1.152)	.853 (.526-1.384)	.701 (.422-1.164)
	Yes[b]			
Pseudo R^2	Cox & Snell R Square Nagelkerke R Square	0.016 0.024	0.074 0.100	0.022 0.030

AOR = Adjusted Odds Ratio; CI = Confidence Interval.
Reference category is indicated by b.
The model was adjusted for potential confounding variables.
Pseudo R^2 values are presented as Cox & Snell and Nagelkerke R^2.
Statistical significance was considered at $p < 0.05$.

The results showed that normal delivery was associated with an increased risk of wasting (AOR = 1.506) but no strong associations with stunting (AOR = 1.029) or underweight (AOR = 0.933). Home delivery was linked to a significantly increased risk of stunting (AOR = 5.170), while no strong associations were observed with wasting (AOR = 0.836) and underweight (AOR = 1.602). Incomplete immunization was associated with a reduced risk of stunting (AOR = 0.201) but showed no strong associations with wasting (AOR = 0.766) and underweight (AOR = 0.47). Birth spacing of one, two, or three years showed no strong associations with malnutrition indicators. The absence of colostrum feeding was associated with an increased risk of stunting (AOR = 2.87) but had no significant associations with wasting (AOR = 1.05) and underweight (AOR = 0.955). Initiation of breastfeeding within two hours was associated with a reduced risk of wasting (AOR = 0.521), stunting (AOR = 0.334), and underweight (AOR = 0.422). Breastfeeding initiation between two and four hours showed no significant associations with malnutrition indicators. The absence of complementary feeding showed no strong associations with wasting (AOR = 0.632), stunting (AOR = 0.853) and underweight (AOR = 0.701). The pseudo-R-squared values were low (Cox & Snell = 0.016-0.074, Nagelkerke = 0.024-0.100), indicating limited explanatory power of the model and suggesting that other factors contribute significantly to malnutrition outcomes.

5. Discussion

The present study provides important insights into child feeding, maternal care, and their association with nutritional outcomes, which are largely consistent with findings from previous literature. The predominance of first- and second-born children aligns with the observations of Roy et al. (2018), suggesting similar family structure patterns in Indian settings. However, unlike their findings indicating a preference for longer birth intervals, the current study observed a considerable proportion of shorter birth spacing, although no significant association with malnutrition was found, consistent with some earlier studies. The high rate of complete immunization (92.2%) is comparable to the findings of David et al. (2020), indicating improved immunization coverage in recent years. Despite this, the lack of association between immunization and malnutrition outcomes in the present study suggests that nutritional status is influenced by multifactorial determinants beyond immunization alone. Breastfeeding practices revealed both encouraging and concerning trends. The high prevalence of colostrum feeding reflects positive adherence to recommended infant feeding practices, consistent with national and global reports (WHO, 2023). However, the persistence of traditional practices such as discarding colostrum and providing prelacteal

feeds (e.g., honey and misri water) highlights the continued influence of cultural beliefs, as also reported by Mishra et al. (2018) and Patel et al. (2020). Delayed initiation of breastfeeding observed in the study contrasts with WHO recommendations and may contribute to adverse nutritional outcomes. The findings on antenatal care and institutional delivery are in agreement with Gaidhane et al. (2021), reflecting improved access to maternal healthcare services. Nevertheless, the observed gender disparity in antenatal care utilization warrants further attention. Suboptimal breastfeeding practices, including early discontinuation, inadequate burping, and poor hygiene, are consistent with previous studies conducted in similar socio-economic settings (Mishra et al., 2018; Patel et al., 2020). Although demand feeding was widely practiced, poor hygiene during feeding may increase susceptibility to infections and malnutrition. Weaning practices in the present study demonstrate early introduction and a preference for semi-solid foods such as rice and dal, similar to findings by Aggarwal et al. (2018). However, the frequent inclusion of biscuits as complementary food deviates from recommended guidelines and reflects inadequate nutritional awareness. The regression analysis highlights that early initiation of breastfeeding has a protective effect against malnutrition, supporting existing evidence on its critical role in child health (WHO, 2023). Conversely, absence of colostrum feeding and home delivery were associated with increased risks of stunting, indicating the importance of appropriate neonatal care practices. However, the low pseudo-R-squared values suggest that other socio-economic, environmental, and dietary factors not included in the model may significantly influence malnutrition outcomes.

6. Conclusion

This study demonstrates that maternal and child health practices play an important, though partial, role in determining the nutritional status of children. High coverage of antenatal care, institutional delivery, immunization, and colostrum feeding reflects improved access to maternal and child health services in the study population. Nevertheless, gaps in optimal breastfeeding behaviours, inappropriate complementary feeding practices, and poor hygiene during feeding remain substantial and may contribute to persistent undernutrition.

Multivariable logistic regression analysis identified home delivery and the absence of colostrum feeding as significant risk factors for stunting, while early initiation of breastfeeding showed a protective association against wasting, stunting, and underweight. These findings emphasize the critical importance of early-life feeding practices in influencing child growth outcomes. The low pseudo R^2 values indicate that childhood malnutrition is multifactorial, underscoring the influence of broader socioeconomic, environmental, and behavioral determinants beyond maternal and child health practices alone. Overall, the findings highlight the need for integrated, community-based interventions that go beyond service coverage to focus on behavior change communication, maternal awareness, and culturally appropriate nutrition education. Strengthening counseling on early initiation of breastfeeding, appropriate complementary feeding, and hygienic feeding practices is essential for improving child nutritional outcomes. Future research should incorporate longitudinal designs and include household, environmental, and socioeconomic factors to better capture the complex pathways leading to childhood malnutrition.

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