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Prevalence and Determinants of Exclusive Breastfeeding among Working Mothers of Infants Aged 6 to 12 months: A Hospital-Based Cross-Sectional Study in Kathmandu, Nepal

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ABSTRACT

Background: Exclusive breastfeeding, a vital infant feeding practice, may be influenced by workplace factors and women's labor force participation. This study aims to identify prevalence of exclusive breastfeeding practices and associated factors among working mothers with infants aged 6 to 12 months.

Methods: A hospital-based cross-sectional study took place from February 2016 to April 2016, involving 250 working mothers at Kanti Children's Hospital, Kathmandu. Mothers were purposively selected and underwent face-to-face interviews using a structured questionnaire. Descriptive statistics, including frequencies, percentages, mean, median, and standard deviation, presented study findings. Multivariate logistic regression analysis identified significant factors associated with exclusive feeding ($p < 0.05$).

Results: In the total sample, the majority of mothers (49.0%) were aged 30-35 years, with a mean age of 29.93 (± 2.79) years. Approximately one-third (33.0%) practiced exclusive breastfeeding, and the majority (52.0%) were employed in academic sectors. While all mothers had access to maternity leave, only 1.6% took a 6-month leave. More than half of the mothers (56%) exhibited poor knowledge of exclusive breastfeeding, and 76% expressed a positive attitude towards workplace breastfeeding. Factors associated with increased exclusive breastfeeding included good knowledge, longer maternity leave, a complete history of postnatal check-ups, and the availability of breastfeeding facilities in the workplace.

Conclusion: Our data indicate a low prevalence of exclusive breastfeeding among working mothers. We recommend the effective implementation of government policies regarding maternity leave and breastfeeding facilities in the workplace. This includes advocating for exclusive breastfeeding, ensuring that both public and private organizations comply with maternity leave provisions, providing adequate breastfeeding facilities at workplaces, and enhancing awareness about the importance of exclusive breastfeeding for the health of both mother and child.

Keywords: Exclusive breastfeeding, working mother, maternity leave, Nepal

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BACKGROUND

Optimal infant nutrition is crucial, with breast milk providing essential nutrients and immunity, reducing infection risks and infant mortality (1,2). Exclusive breastfeeding (EBF), recommended from birth to six months, excludes all liquids except breast milk, promoting healthy growth and development. The WHO advocates EBF for six months to ensure optimal health (3). Children exclusively breastfed have significantly lower risks of diarrhea and acute respiratory disease, potentially saving 1.9 million children globally (4). EBF is also part of the cost-effective initiatives of the SUN movement in Nepal (5).

Despite the benefits of exclusive breastfeeding, work status, whether full-time or part-time, can impact breastfeeding practices (6). Early return

to work within six months postpartum significantly hinders breastfeeding continuation (7). Globally, around 830 million women lack adequate maternity protection, with 80% in Africa and Asia (8). Continuing breastfeeding upon return to work is a woman's right, contingent upon hygienic nursing facilities. Balancing exclusive breastfeeding is especially challenging for working women compared to non-working counterparts (9), often leading to discontinuation due to limited childcare time (10).

In Nepal, while breastfeeding is widespread, exclusive breastfeeding rates have dropped from 70% to 56% between 2011 and 2022 (11). Despite 60% of mothers being employed, the government offers only a 90-day maternity leave, insufficient for the recommended six months of exclusive breastfeeding (12). Returning to work poses a major challenge to sustaining breastfeeding, especially for women in low-wage jobs lacking flexible schedules (13). Research on workplace breastfeeding in Nepal remains limited (14). This study aims to explore factors influencing exclusive breastfeeding in the workplace, providing insights to improve practices and inform policy. The findings will aid policymakers in refining maternity leave policies to better support breastfeeding mothers.

METHODS

A quantitative cross-sectional study was conducted at the Immunization clinic of Kanti Children's Hospital, situated in Maharajgunj, Kathmandu, Nepal, serving as a pediatric healthcare facility. Established in 1963 with assistance from the USSR government, the hospital initially functioned as a general facility with fifty beds. In 1968, the management of Kanti Hospital was transferred from the USSR government to the Ministry of Health of Nepal (15).

The study's sample size was determined using the formula n = Z^2pq/d^2, assuming a proportion (p) of exclusive breastfeeding among working mothers at 0.5 (16), with a margin of error of 6.5 %. Accounting for a 10% allowance for non-response, the final sample size was set at 250. During data collection, we visited the study site and purposively selected respondents with children aged 6-12 months who were currently working.

Data collection employed a self-constructed structured questionnaire, prepared based on a previous study on a similar topic (9,17–21). The questionnaire encompassed demographic and occupational characteristics, as well as questions related to knowledge, attitude, and practices. Knowledge was assessed using 12 statements with Yes/No responses. Respondents who had given correct responses to at least 70% of the questions were categorized as having good knowledge; otherwise, they were considered to have poor knowledge (22). Attitude was measured using a 5-point Likert scale. For negative statements, a score of 5 was given to strongly disagree, and 1 was given for strong agreement, while it was reversed for positive statements. The total score was calculated from the responses, with scores below 80% categorized as negative and scores above 80% as positive (22). Similarly, the practice of exclusive breastfeeding (EBF) was assessed using six questions covering the timing of breastfeeding initiation, the introduction of complementary feeding, and the duration of extended breastfeeding

In this study, exclusive breastfeeding is defined as feeding only breast milk for at least six months, except for ORS and syrups (vitamins, medicines, minerals); early initiation of breastfeeding means starting within one hour after delivery, and complementary feeding is defined as introducing any food or liquid, including non-human milk and solid or semi-solid foods, to the baby after six months. Experts validated the final questionnaire, and a pre-test was conducted among 10% of the total sample size for tool reliability among the respondents with similar characteristics visiting immunization clinic of Tribhuvan University Teaching Hospital. All data were collected through face-to-face interviews conducted between February 2016 and April 2016.

The collected data were entered into EpiData version 3.1 and analyzed using SPSS 17.0. Descriptive statistics, including frequencies, percentages, mean, median, and standard deviation, were employed for presenting study findings. The Chi-Square test assessed associations between independent variables and exclusive breastfeeding. Odd s ratios, with a 95% confidence interval and a significance level of $p < 0.05$, measured the strength of association between exclusive breastfeeding and other independent variables. Covariates with a p-value of less than 0.05 were included in the multivariable logistic regression analysis. To evaluate the model's fit and the fulfillment of necessary assumptions, the Hosmer-Lemeshow goodness-of-fit test and the Nagelkerke R-squared test were utilized and the values found were 0.999 and 0.468, respectively.

Approval was obtained from the Institutional Review Committee of the Institute of Medicine [Ref. No: 158(6-11-02)/072/073] and Kanti Children Hospital (Ref. No: 075). The study's purpose was explained to all participants, and informed written consent was obtained from each participant. Confidentiality was ensured by conducting interviews with mothers in a designated separate room provided by the hospital authority. Study participants were given the option to decline participation.

RESULTS

Demographic and occupational characteristics of the respondents

Out of the 250 participants, the majority (49.0%) were aged between 30 and 35, with a mean age of 29.93 (±2.79) years. Additionally, most respondents (60.0%) had male children, and a significant portion (66.4%) had more than one child. The majority of mothers (64.4%) resided in joint families, held a bachelor's degree (54.8%), and worked in academic sectors (38%). Furthermore, 58% reported the absence of breastfeeding facilities in their workplaces, and only 1.6% had maternity leave extending up to six months.

Similarly, the majority of respondents (69.2%) opted for government health institutions as their place of delivery, and a substantial number (71.2%) had a complete record of postnatal care check visits (Table 1).

Table 1: Demographic and occupational characteristics of the respondents

Variables	Frequency	Percent
Age of the mother		
20-24	9	3.6
25-29	104	41.6
30-34	122	48.8
35-39	15	6.0
Sex of child		
Male	151	60.4
Female	99	39.6
Parity of mother		
One	166	66.4
More than one	84	33.6
Family type		
Nuclear	89	35.6
Joint	161	64.4
Education level		
Secondary	4	1.6
Higher secondary	37	14.8
Bachelor	137	54.8
Masters or above	72	28.8
Occupation		
Academic sector	90	36.0
NGO	66	26.4
Banking sectors	38	15.2
Government sector	23	9.2
Hospital (Government/ Private)	21	8.4
International Non-Governmental Organization	8	3.2
Army/Police	4	1.6
Place of Delivery		
Government Institutions	173	69.2
Private hospital	77	30.8
Complete PNC check up		
Yes	178	71.2
No	72	28.8
Maternity leave time period		
45 days	73	29.2
75 days	2	0.8
14 weeks	3	1.2
2 months	140	56.0
3 months	26	10.4
4 months	2	0.8
6 months	4	1.6
Presence of breastfeeding facilities in office		
Yes	105	42.0
No	145	58.0

Prevalence of exclusive breastfeeding practices

A majority (67.2%) of the respondents did not exclusively breastfeed their children for up to six months. Instead, 49.40% introduced complementary foods, and 35.11% introduced formula milk to their children. Mothers employed in academic sectors exhibited a higher rate of exclusive breastfeeding, with nearly 52.0% (Table 2).

Table 2: Exclusive breastfeeding and introduction of complementary foods

Variables	Frequency	Percent
Practice of exclusive breast feeding		
Yes	82	32.8
No	168	67.2
Additional food given before six months (n =168)		
Jaulo or Daal and Rice	10	5.95
Lito	83	49.40
Formula Milk	59	35.11
Plain Water	16	9.5

Respondents' knowledge about breastfeeding

Twelve questions were posed to assess knowledge about breastfeeding. The majority of respondents correctly affirmed that colostrum should be given to the child (98.8%), breast milk quenches thirst but doesn't promote weight gain (97.6%), EBF helps children grow better (77.2%), and EBF saves children from illnesses (72.0%). However, only 13.2% of respondents accurately acknowledged that breast milk reduces healthcare costs, and only 17.2% correctly responded that a child should not be given additional food before six months (Table 3).

Table 3: Knowledge about breast feeding

Statements	Correct answers (%)
EBF means being fed exclusively on breast milk without providing anything else, except doctor-prescribed medicine and oral rehydration solution, for the first six months	111 (44.4)
EBF saves children from illnesses	180(72.0)
EBF helps children grow better	193(77.2)
Breast milk contains everything a baby needs for the first six months	139(55.6)
EBF reduces the chance of the return of a mother's monthly bleeding	93(37.2)
EBF reduces the likelihood of mothers getting pregnant soon	118(47.2)
Breast milk is clean, safe, convenient, and affordable	118(47.2)
Breast milk reduces healthcare costs	33(13.2)
Breast milk only quenches thirst but does not contribute to an increase in the baby's weight	244(97.6)
Mixed feeding before six months can make a baby healthy	155(62.0)
A child should be given additional food before six months	43(17.2)
The initial milk, i.e., colostrum, should be given to the child	247(98.8)

Respondents' attitude toward breastfeeding

In assessing the attitudes of mothers toward breastfeeding, eight questions were administered. The majority of respondents (70.0%) expressed agreement with the idea that Exclusive Breastfeeding (EBF) is an effective means to reduce family expenses. A significant portion (58.8%) believed that women desiring to breastfeed their infants should refrain from working outside the home, and 53.2% perceived that full-time or part-time work status creates challenges for EBF.

Similarly, a substantial majority (67.6%) disagreed with the notion that breastfeeding or expressing breast milk in the workplace would interfere with work productivity. Additionally, 50.4% disagreed with the statement asserting that breastfeeding is old-fashioned, and formula feeding is a symbol of wealth. Furthermore, a majority (59.0%) strongly disagreed with the idea that there would be weight gain due to extra food demand during breastfeeding, and 58.0% strongly disagreed with the assertion that breastfeeding negatively affects the shape of the breast (Table 4).

Table 4: Attitude towards breast feeding

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
EBF is a good way to decrease family expenses.	72 (28.8)	175(70.0)	2(0.8)	0.0	1(0.4)
Work status, whether it is full time or part time, makes it difficult for EBF.	29(11.6)	133(53.2)	0.0	80(32)	8(3.2)
Breastfeeding or expressing breast milk in the workplace will interfere with work productivity.	1(0.4)	8(3.2)	0.0	169(67.6)	72 (28.8)
Women should not breastfeed or express breast milk at work because it would be embarrassing to co-workers.	0.0	51(20.4)	1(0.4)	111(44.4)	87(34.8)
Women who want to breastfeed their infants should not work outside the home.	2(0.8)	147(58.8)	0.0	42(16.8)	59(23.6)
Breastfeeding is old-fashioned, and formula feeding is a symbol of wealth.	0.0	3(1.2)	0.0	126(50.4)	121(48.4)
Breastfeeding does not make the shape of the breast bad.	0.0	9(3.6)	4(1.6)	92(36.8)	145(58.0)
There will be weight gain due to extra food demand during breastfeeding.	3(1.2)	54(21.6)	2(0.8)	42(16.8)	149(59.0)

Respondents' level of knowledge and attitude toward exclusive breastfeeding

Based on the obtained scores, more than half (56.8%) of the respondents demonstrated poor knowledge of exclusive breastfeeding, while 43.2% exhibited good knowledge. Similarly, the majority (76.4%) held a positive attitude towards breastfeeding practices, with 23.6% expressing a negative attitude (Table 5).

Table 5: Knowledge and attitude patterns among participants in exclusive breastfeeding practices

Variables	Frequency	Percent
Level of knowledge		
Good knowledge (≥ 70% score)	108	43.2
Poor knowledge (< 70% score)	142	56.8
Level of attitude		

Positive attitude (≥ 80% score)	191	76.4
Negative attitude (<80% score)	59	23.6

Multivariate analysis

In the bivariate analysis, factors such as mode of delivery, place of delivery, sex of the child, parity, position in the office, and support from co-workers were not found to be significantly associated with exclusive breastfeeding. However, the percentage of exclusive breastfeeding was higher among those who delivered in government hospitals (68.7%) and those who had normal vaginal deliveries (59.0%) compared to those who delivered in private hospitals or had cesarean sections.

Variables that were significant in bivariate analysis were only transferred to multivariate analysis. It was found that mothers who used to visit home during break time to breastfed and those who were not discriminated against in the workplace due to their breastfeeding status were significant in the bivariate analysis. However, these variables did not remain significant after adjusting for other factors in the multivariate analysis. Thus, We found that the odds of the prevalence of exclusive breastfeeding were significantly higher among respondents with maternity leave of 3 months or more (AOR = 2.7, 95% CI 1.1-6.4), the availability of breastfeeding facilities in the office (AOR = 7.0, 95% CI 2.0-24.7), those who had a complete history of PNC visits (AOR = 3.5, 95% CI 1.5-8.5), and those with good knowledge of exclusive breastfeeding (AOR = 2.0, 95% CI 1.4-2.0) (Table 6).

Table 6: Multivariate analysis of selected variables with exclusive breast-feeding practice

Variables	Crude Odds Ratio (COR) (95% CI)	P value	Adjusted Odds Ratio (AOR) (95% CI)	P value
Maternity leave time period				
Less than 3 months (Ref.)				
3 months or more	2.4(1.2-5.0)	0.016	2.7(1.1-6.4)	0.028*
Presence of breastfeeding facilities in the office				
No (Ref.)				
Yes	8.8(4.8-16.1)	<0.001	7.0(2.0-24.7)	0.002*
Complete PNC check-up				
No (Ref.)				
Yes	5.0(2.3-10.6)	<0.001	3.5(1.5-8.5)	0.005*
Knowledge of respondents				
Poor knowledge (Ref.)				
Good knowledge	5.0(3.0-9.0)	<0.001	2.0(1.4-2.0)	<0.001*
Visiting home for breastfeeding				
Yes	1.889 (1.035-3.448)	0.037	0.889 (0.401-1.971)	0.771
No	Ref			
Discrimination in the office				
Yes	Ref			
No	0.634 (0.575-0.700)	<0.001	0.072 (0.001-0.178)	0.998

* Ref- Reference, * Significant at <0.05

DISCUSSION

Our study underscores the fundamental role of breastfeeding in child rearing, particularly during the critical first 1000 days from pregnancy to a child's second year. This period is pivotal for major developmental milestones and the overall well-being of the child, with breast milk serving as a key nutritional source that supports the child's immune system development, extending its benefits beyond the breastfeeding period.

In the context of Nepal, where breastfeeding is nearly universal, our study revealed that approximately 33% of working mothers practiced exclusive breastfeeding, with a median duration of 4 months. This result contrasts with findings from a 2014 German review article indicating that about 22% of working mothers practiced exclusive breastfeeding for six months (23). However, it is noteworthy that our result is higher than the national prevalence of exclusive breastfeeding, which includes both working and non-working mothers (70% NDHS 2011, 57% MICS 2014, 56% NDHS 2022) (11,23,24), as well as a study conducted in Kathmandu where exclusive breastfeeding for six months was reported at 12% (14including suboptimal breastfeeding practices, are associated with stunting. Rate of stunting was highest in the Mid-western region and lowest in the Eastern region of Nepal. This study aimed to assess the breastfeeding practices in these two regions, as well as to identify factors associated with partial breastfeeding. Methods: We conducted a health facility-based cross-sectional study in the Mid-western and Eastern regions of Nepal from December 2017 to May 2018. Investigators administered a pre-Tested questionnaire among consecutive 574 mother-infant dyads at different levels of health facilities. We dichotomized the breastfeeding pattern to partial breastfeeding and full (exclusive or predominant).

In terms of attitudes, our study found that a substantial majority (76.4%) of respondents had a positive attitude towards exclusive breastfeeding. Although slightly lower than similar studies in Saudi Arabia (90%) and Ethiopia (91.8%), this positive shift in attitudes could

be attributed to improved urban health services (25,26). ANC clinics, in particular, seem to play a crucial role in shaping maternal attitudes, with counseling on infant feeding and breastfeeding contributing to enhanced knowledge and positive attitudes.

Our multivariate analysis identified several significant factors influencing exclusive breastfeeding practices. Mothers with maternity leave exceeding three months were nearly three times more likely to exclusively breastfeed compared to those with shorter maternity leave, aligning with findings from a study conducted in Brazil (20). Furthermore, mothers reporting the presence of breastfeeding facilities in the office were seven times more likely to exclusively breastfeed, consistent with a study in the UK (27). Additionally, respondents with a complete history of ANC visits and knowledge about exclusive breastfeeding exhibited significantly higher odds of practicing exclusive breastfeeding, a result consistent with a study in South West Ethiopia (28).

This hospital-based cross-sectional study was conducted in a single facility. Due to limitations in the study area, a restricted sample size, and the purposive selection of mothers, the study findings may not be broadly applicable to a larger population.

CONCLUSION

Early initiation, exclusive breastfeeding for six months, and continued breastfeeding up to 2 years are pivotal for a child's well-being, fostering cognitive development, and promoting mental health. Despite their significance, the prevalence of exclusive breastfeeding practice among working mothers was observed to be low. Factors such as the duration of maternity leave, mothers' education, availability of breastfeeding facilities in the workplace, and a history of complete postnatal care visits were identified as significant contributors to exclusive breastfeeding practices.

As the Safe Motherhood Act 2075 of Nepal, stated for the provision of 98 days of maternity leave and mandates breastfeeding facilities in the workplace, we recommend evaluating the implementation and effectiveness of these provisions. While the Act sets important standards, it is crucial to assess whether the actual practices and support provided align with these regulations and adequately meet the needs of working mothers. These policies should be rigorously implemented, particularly in private organizations. Additionally, knowledge about exclusive breastfeeding should be enhanced among working mothers through educational initiatives.

Furthermore, we propose conducting a mixed-methods study with a broader study area and a larger sample size, encompassing mothers from both formal and informal sectors. This approach will enable the exploration of diverse factors influencing breastfeeding practices.

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