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FACTORS AFFECTING BREAST-FEEDING PRACTICES IN CHILDREN UNDER TWO YEARS OF AGE

Original Research

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ABSTRACT

Background: Exclusive breastfeeding for the first six months is crucial for optimal infant health and development. However, various maternal, neonatal, and environmental factors can influence breastfeeding practices, leading to suboptimal outcomes.

Objective: To identify and assess the impact of maternal, pregnancy, birth, and infant factors on exclusive breastfeeding among children under two years of age.

Methods: A case-control study was conducted at the Department of Paediatrics, Combined Military Hospital, Kharian, from July 2022 to March 2023. The study included 150 mothers and their children aged over two years. Exclusion criteria encompassed mothers with a history of breast trauma, surgery, irradiation, contraindications to breastfeeding, and neonates with anatomical facial defects. Data were collected on maternal demographics, pregnancy and birth details, infant characteristics, and breastfeeding practices. Statistical analyses, including calculation of adjusted odds ratios (OR) with 95% confidence intervals (CI), were performed to determine associations between various factors and exclusive breastfeeding.

Results: The study identified several factors associated with increased odds of not providing exclusive breastfeeding. Premature birth was significantly associated with higher odds (OR: 12.5; 95% CI: 3.3–45.1; $p<0.001$). Maternal obesity also contributed to increased odds (OR: 3.6; 95% CI: 1.0–12.5; $p=0.046$). Additionally, maternal depression was linked to higher odds (OR: 18.5; 95% CI: 2.6–134.2; $p=0.004$). A maternal perception of inadequate milk supply was associated with increased odds (OR: 9.1; 95% CI: 2.4–35.2; $p=0.001$). Lastly, a non-supportive breastfeeding environment was significantly associated with higher odds (OR: 13.5; 95% CI: 4.2–43.0; $p<0.001$).

Conclusion: Premature birth, maternal obesity, depression, perceived insufficient milk supply, and lack of a supportive environment are significant barriers to exclusive breastfeeding. Addressing these factors through targeted interventions is essential to improve breastfeeding practices and, consequently, infant health outcomes.

Keywords: Breastfeeding, Exclusive breastfeeding, Infant nutrition, Maternal health, Obesity, Premature birth, Social support.

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INTRODUCTION

Breastfeeding is a cornerstone of infant health and development, providing an optimal balance of nutrients essential for growth, as well as significant immunological and microbiome-regulatory benefits. Human breast milk supports the infant's immune system, reduces the risk of infections, and promotes long-term health outcomes. Recognizing its importance, the World Health Organization recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside complementary feeding for up to two years and beyond. Despite these recommendations, many mothers encounter considerable barriers to initiating and sustaining breastfeeding practices, highlighting the need for a deeper understanding of the contributing factors (1).

Breastfeeding practices are influenced by an interplay of maternal, neonatal, and environmental factors. Maternal health conditions, such as obesity, diabetes mellitus, and depression, can delay lactogenesis and reduce the duration of breastfeeding. Infant health challenges, including low birth weight, prematurity, and medical complications, further impede breastfeeding success by interfering with latching or sucking reflexes (2). Perceptions of insufficient milk supply among mothers, whether accurate or not, are a major determinant of early breastfeeding cessation and often lead to supplementation with formula or other alternatives. Sociodemographic factors, such as maternal age, education level, and income, also play a role, with younger or less-educated mothers often reporting lower breastfeeding rates due to limited knowledge or lack of access to supportive resources (3). Environmental determinants, including workplace accommodations, breastfeeding-friendly policies, and cultural attitudes, either enable or hinder sustained breastfeeding efforts, depending on their adequacy and accessibility (4).

The aim of this study was to explore and quantify the factors that negatively impact breastfeeding practices among children under two years of age. Understanding these challenges is crucial for developing evidence-based interventions aimed at improving breastfeeding outcomes. By identifying barriers at maternal, neonatal, and environmental levels, the findings will contribute to the creation of tailored strategies that promote exclusive breastfeeding and sustained complementary feeding. These strategies may include education programs, workplace policies to accommodate breastfeeding mothers, and culturally sensitive community initiatives. Addressing these barriers is critical to achieving WHO breastfeeding recommendations and improving child health outcomes globally (5).

METHODS

The study was designed as a case-control analysis conducted between July 2022 and March 2023 in the Department of Paediatrics at Combined Military Hospital, Kharian. It included 150 mothers and their infants, with informed written consent obtained from all participants prior to inclusion. Non-probability, consecutive sampling was employed for participant selection. The sample size was calculated using the EPI tools sample size calculator, based on an assumed odds ratio of 6.1, an expected proportion of 0.235 in controls, a confidence level of 95%, and a desired power of 95%. The odds ratio used was referenced from Adhikari et al., which compared vaginal delivery versus caesarean section for establishing exclusive breastfeeding practices (6).

The inclusion criteria encompassed all children older than two years of age, regardless of gender, along with their mothers presenting to the outpatient pediatric department for any indication. Exclusion criteria included mothers with a history of breast trauma, surgery, or irradiation, those with contraindications to breastfeeding, and neonates with anatomical facial defects such as cleft lip or palate. Participants with incomplete data records were also excluded to ensure the reliability of findings.

Upon enrollment, detailed documentation was conducted, encompassing maternal, pregnancy, birth, and infant characteristics. Feeding practices were evaluated, including early initiation of breastfeeding—defined as commencing within one hour of birth—exclusive breastfeeding during the first six months, and continuation until two years of age. Mothers were assessed for obesity, diabetes mellitus, depression, and any local breast complications (e.g., cracked nipples, abscesses, or mastalgia) based on clinical history and examination. Infant-related data, including birth weight, gestational age, APGAR scores, and comorbidities, were recorded from medical histories and clinical records. Maternal perceptions regarding breast milk quantity were evaluated, along with cultural and social beliefs about breastfeeding and the availability of safe, private areas for breastfeeding at home or work.

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Data analysis was conducted using IBM SPSS Statistics for Windows, version 26 (IBM Corp, Armonk, USA). Quantitative variables such as gestational age, birth weight, APGAR scores, maternal age, and BMI were expressed as means with standard deviations or medians with interquartile ranges. Qualitative variables, including gender, mode of delivery, maternal obesity, diabetes, depression, perceived milk adequacy, maternal education level, family income, and supportive cultural or workplace environments, were summarized as frequencies and percentages. The cohort was grouped based on two primary outcomes: exclusive breastfeeding during the first six months and complementary feeding until two years of age.

Comparisons between groups were made using the Chi-square or Fisher's exact test for categorical variables and the independent samples t-test or Mann-Whitney U test for continuous variables, as appropriate. Statistical significance was determined at a p-value threshold of ≤0.05. Odds ratios were calculated to determine the strength of association between various variables and exclusive breastfeeding, followed by logistic regression analysis to adjust for potential confounders.

RESULTS

The study analyzed data from 150 mothers and their children, revealing important insights into demographics, maternal health, and breastfeeding practices. The mean gestational age at birth was 37.02 ± 1.45 weeks, with 39 infants (26.0%) born prematurely, defined as before 37 weeks of gestation. Among the infants, 82 (54.7%) were male, and 68 (45.3%) were female. A total of 117 infants (78.0%) were delivered vaginally, while 33 (22.0%) were delivered via caesarean section. The mean birth weight was 2916.30 ± 469.44 g, with 40 infants (26.7%) classified as having low birth weight (<2500 g).

The mean maternal age at the time of delivery was 27.23 ± 3.34 years, with 108 mothers (72.0%) aged less than 30 years. The mean maternal BMI was 28.10 ± 2.30 kg/m², and 36 mothers (24.0%) were classified as obese (BMI >30 kg/m²). The mean APGAR score at birth was 7.75 ± 1.36, with 29 infants (19.3%) scoring less than 7. Regarding maternal health, 22 mothers (14.7%) had diabetes mellitus, either pregestational or gestational, and 23 mothers (15.3%) were diagnosed with and treated for depression.

Maternal perceptions and complications were significant contributors to breastfeeding practices. Forty-nine mothers (32.7%) perceived their breast milk production as insufficient, and 43 (28.7%) experienced local breast complications such as cracked nipples, abscesses, or mastalgia during breastfeeding. Socioeconomic factors revealed that 57 mothers (38.0%) were illiterate, and an equal number belonged to low-income households earning less than $500 per annum. Environmental challenges were also notable, as 67 mothers (44.7%) reported facing an unsupportive home or work environment for breastfeeding.

Regarding breastfeeding practices, 54 mothers (36.0%) were unable to initiate breastfeeding within one hour of birth. Exclusive breastfeeding during the first six months was reported for 69 infants (46.0%), while 59 (39.3%) continued breastfeeding with complementary feeding until two years of age.

Statistical analysis revealed that premature birth (adjusted OR: 12.5, 95% CI: 3.3–45.1, p<0.001), maternal obesity (adjusted OR: 3.6, 95% CI: 1.0–12.5, p=0.046), and maternal depression (adjusted OR: 18.5, 95% CI: 2.6–134.2, p=0.004) were strongly associated with decreased odds of exclusive breastfeeding. Similarly, maternal perception of inadequate milk production (adjusted OR: 9.1, 95% CI: 2.4–35.2, p=0.001) and an unsupportive environment (adjusted OR: 13.5, 95% CI: 4.2–43.0, p<0.001) further reduced the likelihood of exclusive breastfeeding. For breastfeeding with complementary feeding until two years, premature birth (adjusted OR: 5.1, 95% CI: 1.7–15.1, p=0.003), maternal depression (adjusted OR: 7.0, 95% CI: 1.3–36.6, p=0.021), and inadequate milk perception (adjusted OR: 3.8, 95% CI: 1.3–11.0, p=0.015) were significant predictors. An unsupportive environment remained a critical factor, with an adjusted OR of 4.8 (95% CI: 1.9–12.4, p=0.001).

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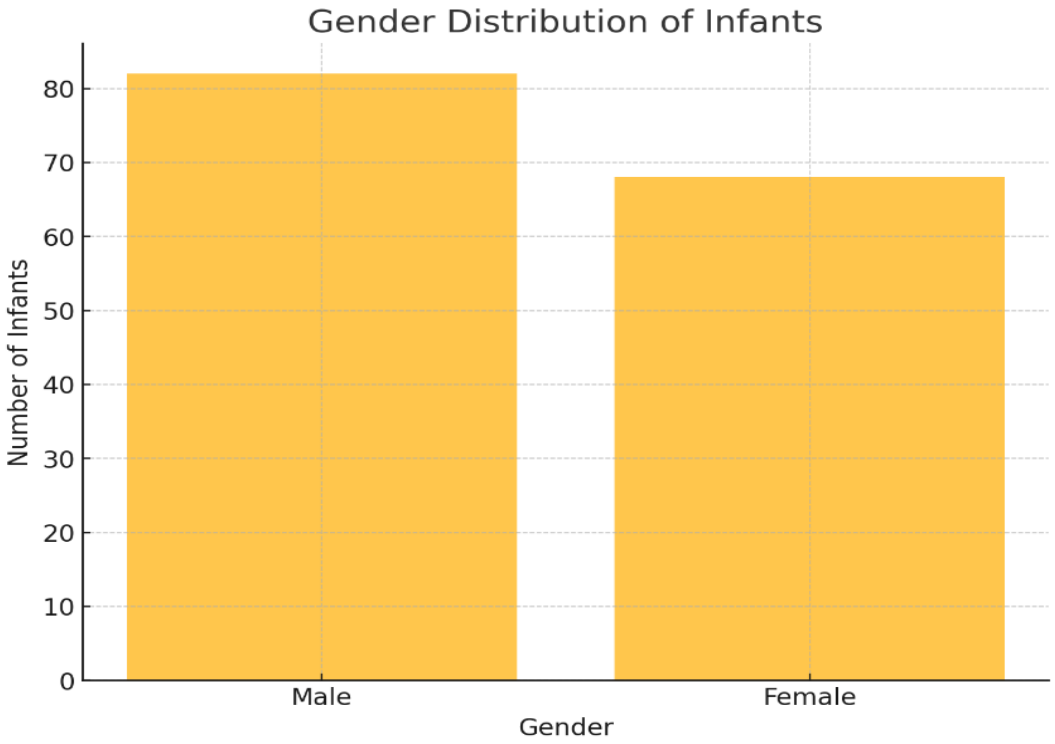


Figure 1 Gender Distribution, 82 (54.7%), 68 (45.3%)

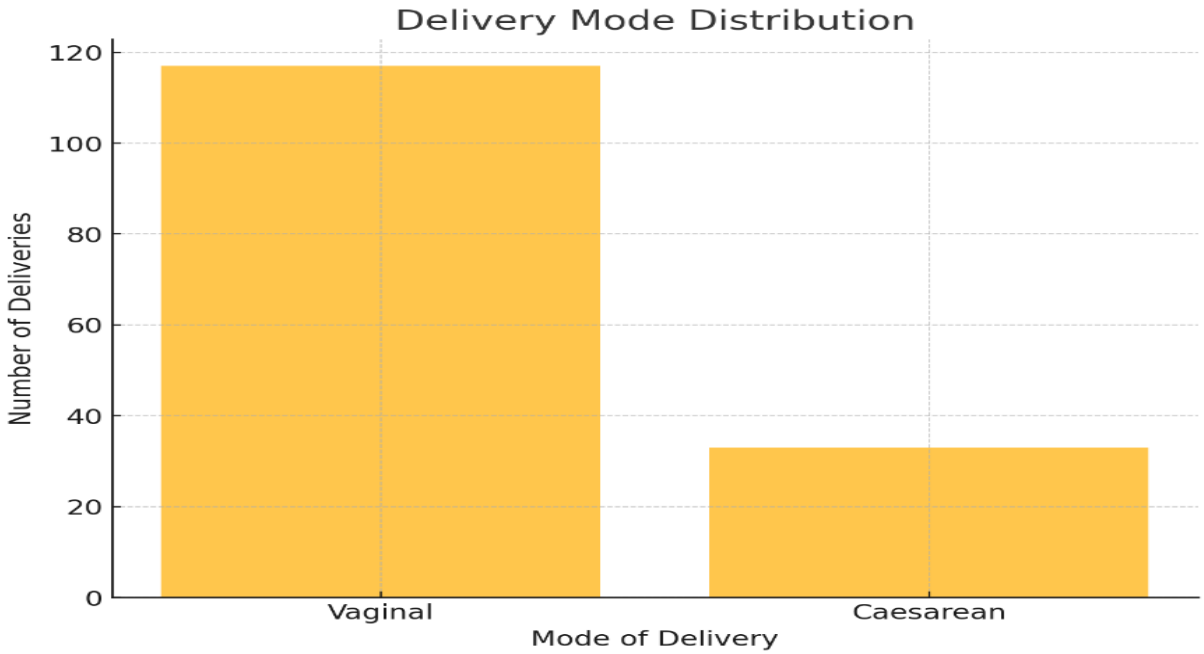


Figure 2 Delivery mode Distribution 117 infants (78.0%) vaginally, (22.0%) caesarean section

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Table 1. Patient characteristics/study results according to neonatal gender (n=150)

Variable	Male (n=82)	Female (n=68)
Gestational Age at Birth (weeks)	36.93 ± 1.55	37.13 ± 1.33
Premature Births: <37 weeks of Gestation	27 (32.9%)	12 (17.6%)
Mode of Delivery		
Per Vaginam	65 (79.3%)	52 (76.5%)
Caesarean Section	17 (20.7%)	16 (23.5%)
Birth-Weight (g)	2962.74 ± 473.75	2860.29 ± 461.43
Low Birth-Weight: <2500 g	20 (24.4%)	20 (29.4%)
Maternal Age (years)	27.46 ± 3.57	26.94 ± 3.03
Young Mothers: Age <30 Years	56 (68.3%)	52 (76.5%)
Maternal Body Mass Index (kg/m2)	27.99 ± 2.40	28.22 ± 2.20
Maternal Obesity: >30 kg/m2 BMI	19 (23.2%)	17 (25.0%)
APGAR score at Birth	7.84 ± 1.37	7.65 ± 1.36
Low APGAR Score: <7	15 (18.3%)	14 (20.6%)
Diabetes Mellitus During Pregnancy	10 (12.2%)	12 (17.6%)
Depression	12 (14.6%)	11 (16.2%)
Perception of Decreased Breast Milk	24 (29.3%)	25 (36.8%)
Development of Breast Complications	24 (29.3%)	19 (27.9%)
Illiterate Mothers	30 (36.6%)	27 (39.7%)
Low Income Family (<$500 per annum)12	30 (36.6%)	27 (39.7%)
Environment Unsupportive of Breast-Feeding	37 (45.1%)	30 (44.1%)
Early Commencement of Breast-Feeding	36 (43.9%)	18 (26.5%)
Exclusive Breast-Feeding till Six Months	34 (41.4%)	35 (51.5%)
Complementary Feeding till Two Years	28 (34.1%)	31 (45.6%)

The study evaluated 150 neonates, comprising 82 males (54.7%) and 68 females (45.3%). The mean gestational age was slightly lower in males (36.93 ± 1.55 weeks) compared to females (37.13 ± 1.33 weeks), with premature births (<37 weeks) more frequent among males (32.9%) than females (17.6%). Vaginal delivery was the predominant mode for both genders (79.3% males, 76.5% females), while caesarean sections accounted for 20.7% of male births and 23.5% of female births. Male neonates had a higher mean birth weight (2962.74 ± 473.75 g) than females (2860.29 ± 461.43 g), though low birth weight (<2500 g) was observed in 24.4% of males and 29.4% of females. Maternal characteristics showed similar trends across genders, with maternal obesity (BMI >30 kg/m²) affecting 23.2% of males and 25.0% of females. Depression was diagnosed in mothers of 14.6% of male and 16.2% of female neonates, while perceived

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insufficient breast milk was reported by 29.3% of mothers of males and 36.8% of females. Early commencement of breastfeeding was less common in females (26.5%) compared to males (43.9%), and exclusive breastfeeding for six months was higher in females (51.5%) than males (41.4%). Complementary feeding until two years was provided for 34.1% of males and 45.6% of females.

Table 2. Adjusted odds ratios for various factors with exclusive breast-feeding till six months of age

Variable	Adjusted Odds Ratio	p-value
Premature Birth	12.5 (CI 95% 3.3 – 45.1)	<0.001
Male Gender	1.3 (CI 95% 0.5 – 3.8)	0.578
Caesarean Section	2.2 (CI 95% 0.6 – 9.1)	0.246
Birth-Weight <2500 g	3.9 (CI 95% 0.9 – 16.6)	0.066
Maternal Age <30 years	0.4 (CI 95% 0.1 – 1.5)	0.184
Maternal BMI >29.9 kg/m2	3.6 (CI 95% 1.0 – 12.5)	0.046
APGAR at Birth <7	0.3 (CI 95% 0.1 – 1.5)	0.149
Diabetes Mellitus during Pregnancy	0.3 (CI 95% 0.1 – 1.5)	0.134
Depression	18.5 (CI 95% 2.6 – 134.2)	0.004
Maternal Perception of Inadequate Breast Milk Quantity	9.1 (CI 95% 2.4 – 35.2)	0.001
Local Complications from Breast Feeding	0.6 (CI 95% 0.2 – 1.7)	0.329
Maternal Illiteracy	1.7 (CI 95% 0.6 – 5.2)	0.318
Low Family Income	0.8 (CI 95% 0.3 – 2.4)	0.701
Non-Supportive Environment for Breast-Feeding	13.5 (CI 95% 4.2 – 43.0)	<0.001
Early Commencement of Breast-Feeding	0.7 (CI 95% 0.2 – 2.2)	0.524

The analysis of factors associated with exclusive breastfeeding until six months revealed several significant predictors. Premature birth was strongly associated with reduced odds of exclusive breastfeeding, with an adjusted odds ratio (OR) of 12.5 (95% CI: 3.3–45.1, p<0.001). Maternal obesity (BMI >29.9 kg/m²) also increased the likelihood of not exclusively breastfeeding (OR: 3.6, 95% CI: 1.0–12.5, p=0.046), as did maternal depression, which had a strikingly high odds ratio of 18.5 (95% CI: 2.6–134.2, p=0.004). A maternal perception of inadequate milk quantity significantly reduced exclusive breastfeeding rates (OR: 9.1, 95% CI: 2.4–35.2, p=0.001). Additionally, a non-supportive breastfeeding environment was a critical factor, with an OR of 13.5 (95% CI: 4.2–43.0, p<0.001). While other factors such as low birth weight (OR: 3.9, 95% CI: 0.9–16.6, p=0.066) approached statistical significance, variables like caesarean delivery (OR: 2.2, p=0.246) and maternal illiteracy (OR: 1.7, p=0.318) were not significant predictors. Protective factors, such as early commencement of breastfeeding, showed a reduced odds ratio (OR: 0.7, p=0.524), though not statistically significant.

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Table 3. Adjusted odds ratios for various factors with complementary breast-feeding for two years

Variable	Adjusted Odds Ratio	p-value
Premature Birth	5.1 (CI 95% 1.7 – 15.1)	0.003
Male Gender	1.4 (CI 95% 0.6 – 3.4)	0.446
Caesarean Section	1.8 (CI 95% 0.6 – 5.9)	0.308
Birth-Weight <2500 g	1.9 (CI 95% 0.6 – 6.4)	0.282
Maternal Age <30 years	0.7 (CI 95% 0.3 – 1.9)	0.481
Maternal BMI >29.9 kg/m2	2.4 (CI 95% 0.8 – 7.2)	0.119
APGAR at Birth <7	0.4 (CI 95% 0.1 – 1.2)	0.102
Diabetes Mellitus during Pregnancy	0.4 (CI 95% 0.1 – 1.4)	0.142
Depression	7.0 (CI 95% 1.3 – 36.6)	0.021
Maternal Perception of Inadequate Breast Milk Quantity	3.8 (CI 95% 1.3 – 11.0)	0.015
Local Complications from Breast Feeding	0.6 (CI 95% 0.2 – 1.6)	0.329
Maternal Illiteracy	0.9 (CI 95% 0.4 – 2.3)	0.869
Low Family Income	0.8 (CI 95% 0.3 – 2.0)	0.654
Non-Supportive Environment for Breast-Feeding	4.8 (CI 95% 1.9 – 12.4)	0.001
Early Commencement of Breast-Feeding	0.8 (CI 95% 0.3 – 2.0)	0.609

The analysis of factors influencing complementary breastfeeding until two years identified several significant predictors. Premature birth significantly reduced the odds of continuing breastfeeding with an adjusted odds ratio (OR) of 5.1 (95% CI: 1.7–15.1, p=0.003). Maternal depression was another critical factor, with an OR of 7.0 (95% CI: 1.3–36.6, p=0.021), highlighting its substantial impact on breastfeeding practices. Maternal perception of inadequate breast milk quantity also posed a significant barrier, with an OR of 3.8 (95% CI: 1.3–11.0, p=0.015). Living in a non-supportive environment further exacerbated the risk of discontinuation, with an OR of 4.8 (95% CI: 1.9–12.4, p=0.001). Other variables, such as maternal BMI >29.9 kg/m² (OR: 2.4, p=0.119) and birth weight <2500 g (OR: 1.9, p=0.282), showed trends towards increased odds but did not reach statistical significance. Factors such as male gender (OR: 1.4, p=0.446), caesarean delivery (OR: 1.8, p=0.308), and maternal illiteracy (OR: 0.9, p=0.869) were not significantly associated with complementary breastfeeding. Protective factors, including early commencement of breastfeeding, showed reduced odds (OR: 0.8, p=0.609), but these findings were not statistically significant.

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DISCUSSION

The findings of this case-control study provide valuable insights into the factors influencing breastfeeding practices in children under two years of age, particularly the association of maternal, neonatal, and environmental variables with exclusive breastfeeding up to six months and complementary breastfeeding up to two years (7). The results demonstrated that premature birth, maternal depression, perceptions of inadequate milk supply, and an unsupportive breastfeeding environment were critical determinants impacting breastfeeding practices. These factors highlight the complex interplay of physiological, psychological, and societal influences on maternal behavior and child nutrition (8).

Premature birth emerged as a significant factor negatively associated with exclusive and complementary breastfeeding (9). The reduced ability to initiate and sustain breastfeeding in preterm infants has been attributed to their frequent transfer to intensive care units, reliance on expressed milk, and developmental challenges in establishing effective sucking and swallowing reflexes. This aligns with previous studies demonstrating similar outcomes, where lower gestational age was linked to reduced breastfeeding duration and exclusivity. The findings underscore the necessity of targeted interventions, such as enhanced lactation support for mothers of preterm infants (10).

The study did not observe significant differences in breastfeeding practices across neonatal genders. This contrasts with earlier reports that linked female neonates with suboptimal breastfeeding practices due to cultural and psychological factors, including maternal depression in certain societies. The results suggest that cultural and societal norms may play a more prominent role than neonatal gender in influencing breastfeeding practices, especially in populations where breastfeeding is religiously and culturally endorsed (11).

Contrary to some earlier findings, caesarean delivery did not significantly affect breastfeeding practices in this study. Institutional policies supporting immediate postpartum care and breastfeeding counseling may mitigate the negative impact of caesarean sections on breastfeeding. Nonetheless, the logistical and physical challenges posed by caesarean deliveries require continued attention to ensure breastfeeding initiation and sustainability (12).

Low birth weight was associated with decreased exclusive breastfeeding, although the findings were not statistically significant. This may be attributed to the small sample size, which could have limited the study's ability to detect meaningful differences. Previous literature indicates that lower birth weights often correlate with delayed breastfeeding initiation and reduced duration, necessitating focused efforts to address this vulnerable group (13).

Maternal obesity was associated with reduced odds of exclusive breastfeeding, corroborating existing evidence that highlights the physiological and mechanical challenges obese mothers face in initiating and maintaining lactation. These challenges include delayed lactogenesis, lower milk volumes, and difficulties in latching. However, obese mothers in this study demonstrated the ability to sustain complementary breastfeeding, suggesting that early postpartum support might bridge this gap and improve outcomes (14).

Maternal depression emerged as a key factor influencing breastfeeding negatively, as depressed mothers were less likely to provide exclusive or complementary breastfeeding. Depression not only affects maternal-infant bonding but also diminishes confidence and self-efficacy in breastfeeding, leading to early discontinuation. Addressing maternal mental health through screening, counseling, and support services remains a priority to improve breastfeeding rates and child nutrition (15).

Perceptions of inadequate milk supply were among the most significant barriers to breastfeeding practices. Mothers who believed they were unable to produce sufficient milk were more likely to discontinue exclusive breastfeeding prematurely and were less likely to continue complementary breastfeeding. These perceptions, often unsupported by clinical evidence, highlight the critical need for education and reassurance about breastfeeding adequacy to address this widespread concern (16).

Environmental factors, particularly the presence of a non-supportive home or work environment, were strongly associated with reduced breastfeeding rates. Women in such environments faced significant challenges in continuing exclusive or complementary breastfeeding, emphasizing the importance of creating conducive spaces for breastfeeding at both domestic and workplace levels. Hygienic, private, and culturally appropriate areas for breastfeeding, combined with supportive policies and family dynamics, are crucial for sustaining breastfeeding practices (17).

The study's strengths include its comprehensive approach to examining multiple maternal, neonatal, and environmental variables and their association with breastfeeding practices. However, limitations must be acknowledged. The reliance on self-reported data introduces the risk of recall bias, and the single-center design limits generalizability to broader populations. The relatively small sample size may have reduced the power to detect statistically significant associations for certain variables. Additionally, factors such as ethnicity,

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seasonal influences, and access to clean water were not assessed, which could have provided a more nuanced understanding of breastfeeding challenges. Prospective studies with larger, more diverse populations are warranted to validate these findings and explore causal relationships (18).

This study highlights critical areas for intervention, including tailored support for mothers of preterm and low-birth-weight infants, targeted mental health services for mothers, and comprehensive education to address misconceptions about milk adequacy (19). Addressing environmental and institutional barriers remains imperative to fostering an ecosystem where breastfeeding can thrive, ultimately improving maternal and child health outcomes (20).

CONCLUSION

This study identifies several key factors influencing breastfeeding practices in children under two years of age, including premature birth, maternal depression, perceptions of breast milk adequacy, and the supportiveness of the surrounding environment. Addressing these variables through targeted interventions may enhance breastfeeding practices. Further research is necessary to confirm these findings across diverse populations and settings and to develop effective strategies to promote optimal breastfeeding practices.

AUTHOR CONTRIBUTIONS

Author	Contribution
Adeel Mehmood	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Masud Murad Khan	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Saeed Zaman	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Fawad Ahmed Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Iqra Irfan	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Anum Pervaiz	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Muhammad Farrukh Habib	Writing - Review & Editing, Assistance with Data Curation

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