DISSERTATION REPORT

AT

IIHMR, DELHI

A REPORT ON

SOCIO-ECONOMIC AND REGIONAL VARIATION OF EXCLUSIVE BREASTFEEDING PRACTICES IN INDIA, 2019-21

BY

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PG/22/031

UNDER GUIDANCE OF

DR. PIJUSH KANTI KHAN

PGDM (HOSPITAL AND HEALTH MANAGEMENT)

2022-2024

The certificate is awarded to

DR. DURGESH NANDINI GAUTAM

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Associate Dean, Academic and Student Affairs
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Dr. Pijush Kanti Khan
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Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Durgesh Nandini Gautam,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He/ She is submitting this dissertation titled "**SOCIO-ECONOMIC AND REGIONAL VARIATION OF EXCLUSIVE BREASTFEEDING PRACTICES IN INDIA, 2019-21**" at "**IIHMR, DELHI**" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

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Assistant Professor, Mentor
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ACCREDITATION

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DATE: DR.DURGESH NANDINI GAUTAM

TABLE OF CONTENTS

LIST OF ABBREVATION

S.NO.	ABBREVATION	MEANING/FULL FORM
1	EBF	EXCLUSIVE BREAST FEEDING
2	WHO	WORLD HEALTH ORGANISATION
3	UNICEF	UNITED NATIONS CHOLDREN FUND
4	NHFS	NATIONAL HEALTH FAMILY SURVEY
5	BMI	BODY MASS INDEX
6	DHA	DOCOSAHEXAENOIC ACID
7	DHS	DEMOGRAPHIC AND HEALTH SURVEY
8	MICS	MULTIPLE INDICATIR CLUSTER SURVEYS
9	EIBF	EARLY INITIATION OF BREAST FEEDIND

ABSTRACT

BACKGROUND:

This study investigates exclusive breastfeeding (EBF) practices across various regions and socio-economic groups in India using data from the fifth round of the National Family Health Survey (NFHS-5). The analysis encompasses a range of socio-demographic factors, including maternal age, education, and regional differences, to identify determinants of EBFs. Additionally, maternal age significantly influences EBF, with mothers between the ages of 20 to 34 years being more likely to practice EBF compared to those between the ages of 15 to 19 years. The study underscores the need for targeted interventions to enhance EBF practices, particularly in regions and demographic groups with lower rates. The health benefits of EBF, including reduced infant morbidity and mortality, improved cognitive development, and enhanced maternal health, are also highlighted, emphasizing the importance of promoting EBF for overall public health improvement.

METHODOLOGY:

This study's methodology involved a cross-sectional design, utilizing the NFHS-5 dataset, which includes comprehensive health-related indicators collected from 636,699 households across India. The results indicate that while India has made progress in early initiation of breastfeeding, significant regional and socio-economic disparities persist, necessitating focused efforts to promote and support EBF practices nationwide.

DISCUSSION: The analysis of factors linked to exclusive breastfeeding (EBF) status uncovers several notable associations. Maternal age shows a significant impact, with women aged 20-34 and 35-49 having considerably higher odds of practicing EBF compared to those aged 15-19, with odds ratios (OR) of 1.87 (95% CI: 1.52-2.31) and 1.77 (95% CI: 1.34-2.35), respectively ($P < 0.001$ for both). The education level of the mother does not significantly influence EBF, as shown by non-significant ORs across primary, secondary, and higher education levels. The child's gender shows a slight association, with female children being marginally less likely to be exclusively breastfed (OR: 0.90, 95% CI: 0.82-0.99, $P = 0.035$).

Residence type also plays a role, with rural residents having lower odds of EBF (OR: 0.81, 95% CI: 0.71-0.91, P < 0.001) compared to urban residents. There are significant regional differences, with the South and Northeast regions showing higher odds of EBF compared to the North, while the Central region shows lower odds. Delivery location and type of delivery do not show significant associations with EBF status. These results emphasize the role of demographic and regional factors in influencing breastfeeding practices.

RESULT:

The analysis of factors linked to exclusive breastfeeding (EBF) status uncovers several notable associations. Maternal age shows a significant impact, with women aged 20-34 and 35-49 having considerably higher odds of practicing EBF compared to those aged 15-19, with odds ratios (OR) of 1.87 (95% CI: 1.52-2.31) and 1.77 (95% CI: 1.34-2.35), respectively (P < 0.001 for both). The education level of the mother does not significantly influence EBF, as shown by non-significant ORs across primary, secondary, and higher education levels. The child's gender shows a slight association, with female children being marginally less likely to be exclusively breastfed (OR: 0.90, 95% CI: 0.82-0.99, P = 0.035). Type of residence also plays a role, with rural residents having lower odds of EBF (OR: 0.81, 95% CI: 0.71-0.91, P < 0.001) compared to urban residents. There are significant regional differences, with the South and Northeast regions showing higher odds of EBF compared to the North, while the Central region shows lower odds. Delivery location and type of delivery do not show significant associations with EBF status. These results emphasize the role of demographic and regional factors in influencing breastfeeding practices.

CONCLUSION:

The analysis highlights the complex factors influencing exclusive breastfeeding (EBF) practices. Younger mothers, those living in rural areas, specific regions (especially the Central region), hospital deliveries, and receiving breastfeeding advice were associated with higher EBF rates. Educational level, wealth status, and infant gender showed minimal impact on EBF rates. These findings are crucial for designing targeted interventions to promote EBF by addressing specific

demographic segments and enhancing breastfeeding support across different socio-demographic contexts. Future research should explore the mechanisms driving these associations to develop more effective public health strategies.

SECTION 1

SOCIO-ECONOMIC AND REGIONAL VARIATION OF EXCLUSIVE BREASTFEEDING PRACTICES IN INDIA. 2019-21

INTRODUCTION:

Exclusive breastfeeding is the practice of feeding a baby only breast milk for the first six months of life. Breast milk is the first natural diet for neonates. It delivers all the nutrients, minerals and energy that a newborn requires for the first six calendar months of life, up to half or more required during the second half of infancy and approximately one-third required during the second year of the life (1,2). Breastfeeding has been shown to reduce a mother's chance of developing breast and ovarian cancer (3,4), greater weight loss during postpartum (5) and lowers blood pressure (6) compared to non-breastfeeding mothers.

Half of Indian babies under six months aren't getting the recommended exclusive breastfeeding. Breast milk provides everything a baby needs to grow strong and healthy during this crucial period. While there's been some improvement in recent surveys, a significant gap remains. Over 50% of Indian mothers still aren't exclusively breastfeeding for the full six months recommended by the World Health Organization (WHO). The percentage of children under six months old who are exclusively breastfed has reached 48% globally, almost reaching the 50% goal set by the World Health Assembly for 2025(UNICEF).

Breastfeeding is a common practice of giving nutritional supplements to newborn and young infants by breast milk. It is very critical that infants begin breastfeeding as early as possible. The simplest and least expensive way to meet an infant's nutritional needs is to breastfeed them. A baby's ability to grow and develop in a way that is desired is affected by poor feeding methods and their impacts. Giving an infant exclusively breast milk during the first six months of their life is known as exclusive breastfeeding. Numerous internal and external factors influence exclusive breastfeeding. Worldwide, the incidence of exclusive breastfeeding is far too low. The prevalence of exclusive breastfeeding ranges from 30 to 50% worldwide, but in India it is 54.9%. In India, exclusive breastfeeding rates varied widely between 35.8 to 77.2% due to cultural, religious, and geographic differences. Breastfeeding exclusively can minimize an infant's

morbidity and mortality by lowering the incidence of both communicable and noncommunicable disorders.

Indian women's decisions to start, continue, and stop breastfeeding are influenced by a numerous variables. These include characteristics that are both psychological and physical, such as BMI, age, gestational age, parity, and the women's psychosocial state up to six months after giving birth. Furthermore, breastfeeding practices can be impacted by sociodemographic variables such the infant's sex, socioeconomic situation, and education level. There is currently little data on how maternal characteristics affect an infant's nutritional condition if the infant is older than six months. There is currently little data on how maternal characteristics affect an infant's nutritional condition if the infant is older than six months. These estimations are affected by multiple additional sources of systematic error. The majority of research do not include nutrition surveys for infants younger than six months old, hence data regarding their food intake is lacking.

The findings of the systematic review indicate that exclusively breastfeeding babies fed just breast milk for six months, without any other foods or liquids, offers numerous benefits compared to exclusive breastfeeding for three to four months followed by mixed feeding.

According to a publication, in Uttar Pradesh, about 24% of women who gave birth in a healthcare facility began breastfeeding within the first hour, in contrast to 16% of those who gave birth at home.

SECTION-2

RATIONALE:

Breastfeeding habits are influenced by a variety of elements, including cultural, socioeconomic, and individual factors related to both the mother and the infant. Research from developing countries indicates that extended breastfeeding is associated with increased linear growth in children. Moreover, recent studies show that prolonged breastfeeding benefits mothers by lowering the risk of developing type I diabetes and reducing the likelihood of becoming overweight later in life.(7)

The percentages of exclusive breastfeeding varied significantly depending on the mix of mother education, wealth index, residence, and religion. The children in the Secondary/Urban/Poor/Others group had the highest exclusive breastfeeding prevalence, whereas the lowest frequency is observed in Primary/Rural/Rich/Others group.

India is characterized by significant regional diversity, influencing various aspects of healthcare practices, including breastfeeding. NFHS 5 data reveals that exclusive breastfeeding rates vary considerably across different states and regions. For instance, states in the southern and northeastern regions often show higher rates of exclusive breastfeeding compared to states in the northern and central regions. Understanding these regional disparities helps in tailoring interventions and policies to target regions with lower rates, ensuring more consistent support and education on the benefits of exclusive breastfeeding. India is characterized by significant regional diversity, influencing various aspects of healthcare practices, including breastfeeding. NFHS 5 data reveals that exclusive breastfeeding rates vary considerably across different states and regions. For instance, states in the southern and northeastern regions often show higher rates of exclusive breastfeeding compared to states in the northern and central regions. Understanding these regional disparities helps in tailoring interventions and policies to target regions with lower rates, ensuring more consistent support and education on the benefits of exclusive breastfeeding.

OBJECTIVES:

- To examine the level of exclusive breastfeeding practices across regions and socio-economic groups in India.
- To examine the factors related to exclusive breastfeeding practices in India

SECTION 3

REVIEW OF LITARATURE

WHY THIS IS STUDY IS IMPORTANT?

Exclusively breastfeeding (EBF) is crucial for the health and growth of babies and has significant effects on public health. Exclusive breastfeeding in the first half-year of life supplies infants with necessary nutrients, energy, and antibodies crucial for their growth and development. It greatly decreases the chance of infections like diarrhea and respiratory diseases, which are leading causes of infant death globally. Furthermore, EBF enhances sensory and cognitive growth, resulting in improved academic achievements in the future.

For moms, exclusive breast feeding aids in post-birth healing, lowers the chances of breast and ovarian cancers, and promotes natural child spacing thanks to lactational amenorrhea. Encouraging exclusive breast feeding (EBF) from a public health standpoint can result in significant healthcare cost reductions by lowering rates of childhood diseases and long-term health issues. Moreover, by researching and recognizing obstacles to exclusive breastfeeding, it is possible to develop policies and initiatives that promote breastfeeding, leading to better health results for mothers and babies worldwide .NFHS 5 data underscores the economic benefits of exclusive breast feeding, highlighting that breast feeding reduces the economic burden on families by decreasing healthcare costs associated with treating illnesses in infants who are not exclusively breastfed.

Various key rationales why exclusive breastfeeding is emphasized by health authorities worldwide:

1. **Nutritional Advantage**: Breast milk is specially formulated to fulfill the nutritional needs of infants. It has the ideal combination of proteins, fats, carbs, vitamins, and minerals necessary for growth and development in the first six months of life. Formula milk is unable to recreate the intricate structure of breast milk.
2. **Immune System Boost**: Breast milk contains antibodies, enzymes, and white blood cells that aid in protecting babies from infections and diseases.. It provides passive immunity, which is crucial in the early months of life when an infant's immune system is still developing.

3. **Digestive Health**: Breast milk is easily digestible, which reduces the risk of gastrointestinal issues like diarrhea and constipation in infants. This is particularly important in regions with limited access to clean water and proper sanitation.
4. **Cognitive Development**: Studies have shown that infants who receive breast milk tend to experience improved cognitive development compared to infants who are given formula. DHA (docosahexaenoic acid) is a vital part of breast milk that is necessary for the growth of the brain.
5. **Reduced Risk of Chronic Diseases**: Breastfeeding has been linked to decreased likelihood of developing long-term conditions like obesity, diabetes, and specific allergies. The protective advantages of breastfeeding last beyond infancy and continue into childhood and adulthood.
6. **Bonding and Emotional Development**: Breastfeeding promotes a strong bond between mother and baby by allowing skin-to-skin contact and releasing hormones such as oxytocin, which helps in establishing a close relationship and emotional growth between the two.
7. **Environmental Sustainability**: Breastfeeding is environmentally friendly as it yields zero waste, not involves packaging, and has a minimal carbon footprint compared to the production and disposal of formula milk.
8. **Cost-Effective**: Breast feeding saves families money by removing the necessity to buy formula milk, bottles, and sterilization equipment. It additionally decreases healthcare expenses by reducing the frequency of infant diseases.
9. **Promotion of Maternal Health**: Breastfeeding provides various health benefits to breastfeeding mothers, including rapid postpartum weight reduction, decreased risk of ovarian and breast cancers, and improved mental health due to hormone release during breastfeeding.

Exclusive breastfeeding (EBF) is a vital health measure that promotes the growth and development of newborn infants. According to the World Health Organization (WHO), approximately 820,000 children could be saved annually through exclusive breast feeding. EBF significantly decreases infant mortality and morbidity by fostering optimal immune system development and shielding against prevalent childhood illnesses such as diarrhea, gastrointestinal infections, pneumonia, and allergies. Research indicates that cognitive development and intelligence scores are enhanced in infants who receive exclusive breastfeeding, and they also have a reduced risk of childhood overweight and obesity (8). The National Family Health Survey-5 reveals that while 88·6% of births take place in healthcare facilities in India, only 41·8% of women are able to commence breastfeeding within the first hour following delivery. This disparity underscores the urgent necessity for enhanced breastfeeding practices throughout the country(9).

While India has shown improvement in increasing early initiation of breastfeeding rates over the past decade [15], regional data suggests that the proportion of mothers initiating breastfeeding within the first hour of birth still falls below expected levels, ranging from 36% to 42% (10).

Despite the numerous benefits and various interventions promoting exclusive breastfeeding (EBF), its global prevalence remains unacceptably low, with significant variation within and between countries. According to a 2018 WHO report, the global prevalence of EBF is 40%. In 2019, a UNICEF report indicated that approximately 44% of children worldwide were exclusively breastfed, with Asian countries reporting a slightly higher prevalence of 57%. A previous multi-country study by Cai and colleagues found that EBF prevalence in developing countries had increased from 33% to 39% over five years(8).

In India, cultural practices related to lactation and breastfeeding are highly diverse. These practices range from exclusive breastfeeding to the inclusion of various amounts of prelacteal and supplemental feeding, which may involve the use of infant formula or different types of animal milk.

In Low- and Middle-Income Countries (LMICs), merely 37% of infants are exclusively breastfed during the recommended first six months of life . According to UNICEF, which draws from Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS), and other

nationally representative data sources (2015–2021), the global rate of exclusive breastfeeding for infants aged 0 to 5 months is 48%. The highest prevalence of exclusive breastfeeding, at 61%, is recorded in the South Asian region(9).

Early initiation of breastfeeding (EIBF) lowers the risk of neonatal mortality. Previous research in India has identified certain factors linked to EIBF. However, these studies often relied on data with limited sample sizes, which may impact the applicability of their findings(7). Numerous studies in developing countries, including India, have investigated the factors influencing early initiation and exclusive breastfeeding. Recent estimates reveal that only about 43% of children born in the six months before the survey were breastfed within one hour of birth, suggesting that over half (57%) experienced delayed breastfeeding(7).

Exclusive breastfeeding also offers significant health benefits for mothers, including a reduced risk of breast and ovarian cancer, type 2 diabetes, and heart disease . Additionally, it promotes uterine contractions by increasing oxytocin levels and helps decrease bleeding during pregnancy. In low- and middle-income countries, exclusively breastfed infants are associated with a 13% lower risk of mortality compared to non-exclusively breastfed infants (8).

Studies have highlighted the uneven prevalence of exclusive breastfeeding (EBF) across various social stratifications, including religion, social class, maternal education, place of residence, and the mother's employment status (11). In India, several studies have found that factors such as rural residency, living in poorer households, and higher maternal education levels are associated with EBF (8).

Breastfeeding practices are influenced by various factors, including cultural, socioeconomic, and individual elements related to both the infant and the mother. Research from developing countries shows that prolonged breastfeeding is associated with improved linear growth in children. Furthermore, recent studies suggest that extended breastfeeding benefits mothers by lowering the risk of developing type 1 diabetes and reducing the likelihood of becoming overweight later in life.(7).

The prevalence of stunted growth in children under five has declined over the past twenty years but remains higher in South Asia and sub-Saharan Africa compared to other regions. In 2011,

stunting affected at least 165 million children globally, while wasting impacted at least 52 million children. Vitamin A and zinc deficiencies lead to fatalities, and iodine and iron deficiencies, along with stunting, hinder children's developmental potential. Maternal under nutrition contributes to fetal growth restriction, increasing the risk of neonatal deaths and stunting by age two in survivors. Inadequate breastfeeding practices elevate the risk of mortality within the first two years of life.(12).

DATA SOURCE AND METHODOLOGY:

- **Data Source:** This study made use of data from the fifth round of the National Family Health Survey, which is a comprehensive survey conducted in India and covers a wide range of topics. The NFHS-5 collected detailed data on health indicators such as exclusive breastfeeding practices in children from different socioeconomic and demographic backgrounds. This information was gathered through standardized surveys conducted in households in various states and union territories.

- **Study Design**: This study employed a cross-sectional design, utilized the most recent wave of NFHS 5 data. The NFHS-5 survey covered 636,699 households in 707 districts, 28 states, and 8 union territories, achieving a response rate of 98%. The study concentrated on people between the ages of 15 and 49, examining a wide range of substance usage patterns and family relationships in households.

- **Variables**: Our research obtained the 'children recode file' from the DHS program website. Infants aged 0-6 months were included in our study to analyze the distribution of exclusive breastfeeding practices during the first 6 months. Factors such as socioeconomic indicators (education, income, occupation), regional variables (state/union territory, urban/rural residence), and medical factors were taken into account for our analysis.

- **Statistical Analysis**: Descriptive statistics was used to examine the prevalence of substance use across different socioeconomic and regional categories. Multivariate analysis was employed to identify socio-demographic determinants associated with exclusive breast feeding practices controlling for potential confounders.

RESULT:

The analysis of factors associated with exclusive breastfeeding (EBF) status reveals several significant associations. Mother's age demonstrates a clear influence, with women aged 20-34 and 35-49 having significantly higher odds of practicing EBF compared to those aged 15-19, with odds ratios (OR) of 1.87 (95% CI: 1.52-2.31) and 1.77 (95% CI: 1.34-2.35), respectively ($P < 0.001$ for both). The level of education appears to have no significant impact, as indicated by non-significant ORs across primary, secondary, and higher education levels. Gender of the child shows a modest association, with female children slightly less likely to be exclusively breastfed (OR: 0.90, 95% CI: 0.82-0.99, $P = 0.035$). Residence type also affects EBF, with rural residents having lower odds (OR: 0.81, 95% CI: 0.71-0.91, $P < 0.001$) compared to urban residents. Regional variations are notable, with the South and Northeast regions having significantly higher odds of EBF compared to the North, while the Central region has lower odds. Delivery location and type of delivery do not show significant associations with EBF status. These findings highlight the importance of demographic and regional factors in influencing breastfeeding practices.

The detailed association analysis of exclusive breastfeeding (EBF) status sheds light on various demographic and socio-economic factors that influence breastfeeding practices. Among maternal age groups, the analysis shows that mothers aged 20-34 and 35-49 are more likely to practice EBF compared to the reference group of 15-19 years, with odds ratios (OR) of 1.87 (95% CI: 1.52-2.31) and 1.77 (95% CI: 1.34-2.35), respectively. These associations are statistically significant with P-values less than 0.001, indicating a strong correlation between maternal age and EBF.

In terms of education, there appears to be no significant difference in EBF rates across different education levels. Mothers with primary education have an OR of 1.00 (95% CI: 0.85-1.17, $P = 0.973$), secondary education an OR of 0.933 (95% CI: 0.83-1.04, $P = 0.242$), and higher education an OR of 1.07 (95% CI: 0.90-1.27, $P = 0.411$). This suggests that education level alone does not significantly impact the likelihood of exclusive breastfeeding.

Child gender is another factor, with female children having slightly lower odds of being exclusively breastfed (OR: 0.90, 95% CI: 0.82-0.99, P = 0.035) compared to male children. This statistically significant finding suggests a gender-based disparity in breastfeeding practices.

The type of residence also plays a crucial role. Mothers residing in rural areas are less likely to practice EBF compared to their urban counterparts, with an OR of 0.81 (95% CI: 0.71-0.91, P < 0.001). This highlights the need for targeted interventions in rural areas to promote exclusive breastfeeding.

Regional differences are prominent, with mothers in the South (OR: 1.56, 95% CI: 1.34-1.82, P < 0.001) and Northeast (OR: 1.61, 95% CI: 1.37-1.89, P < 0.001) regions more likely to practice EBF compared to the North. Conversely, mothers in the Central region are less likely to practice EBF (OR: 0.88, 95% CI: 0.77-0.99, P = 0.041). These regional variations point to the influence of cultural, social, and possibly economic factors on breastfeeding practices.

Finally, the place of delivery and type of delivery do not show significant associations with EBF. Mothers who delivered in hospitals have an OR of 0.91 (95% CI: 0.79-1.04, P = 0.196) compared to those who delivered at home. Similarly, the type of delivery, whether normal or caesarean, does not significantly impact EBF status (OR: 1.02, 95% CI: 0.89-1.17, P = 0.716).

In conclusion, the analysis underscores the multifaceted nature of factors influencing exclusive breastfeeding, with significant associations observed for maternal age, child gender, type of residence, and regional differences. These insights can inform targeted strategies to promote and support exclusive breastfeeding across different demographics and regions.

TABLE 1: Socio-demographic characteristics of the new born with regard to breast feeding

Characteristics	EBF- n (%)	Non-EBF - n (%)	Total
Mother's Age (in years)			
15-19	1854 (91%)	192 (9%)	2046
20-34	19,250 (84%)	3753 (16%)	23,004
35-49	986 (84%)	182 (16%)	1168
Mother'sLevel of Education			
No education	4013 (84%)	766 (16%)	4780
Primary	2463 (84%)	471 (16%)	2934
Secondary	11,632 (84%)	2073 (16%)	13706
Higher	3981(83%)	817 (17%)	4797
Gender			
Male	11,243 (84%)	2,207 (16%)	13,449
Female	10,848 (85%)	1,922 (15%)	12,769
Type of Residence			
Urban	5294 (82%)	1156 (18%)	6450
Rural	16,796 (85%)	2972 (15%)	19,768
Religion			

Hindu	17658 (85%)	3104 (15%)	20,762
Muslim	3507(82%)	789 (18%)	4297
Christian	450 (78)	130 (22%)	580
Others	474 (82%)	105 (18%)	579
Caste			
Schedule caste	5237 (85%)	890 (15%)	6127
Schedule tribe	2308 (86%)	379 (14%)	2688
OBC	9770 (84%)	1822 (16%)	11,592
Others	4775 (82%)	1035 (18%)	5810
Regions			
South	3240 (79%)	867 (21%)	4107
North	3314 (85%)	566 (15%)	3880
Central	6907 (87%)	1039 (13%)	7947
East	5537 (85%)	997 (15%)	6534
West	2398 (84%)	466 (16%)	2864
Northeast	694 (78%)	191 (22%)	885
Wealth Status			
Poor	10,278 (85%)	1802 (15%)	12,080
Middle	4374 (85%)	770 (15%)	5,144
Rich	7437 (83%)	1556 (17%)	8993

Place of Delivery			
Home	2,001 (83%)	405 (17%)	2,406
Hospital	20,089 (84%)	3,722 (16%)	23,812
Type of Delivery			
Normal	16,886 (84%)	3,137 (16%)	20,023
Cessarean	5,204 (84%)	991 (16%)	6195
Advice of Breastfeeding			
Yes	14,240 (84%)	2,752 (16%)	16,992
No	1,727 (87%)	258 (13%)	1,985
Total	**22,090 (84%)**	**4,128 (16%)**	**26,218 (100%)**

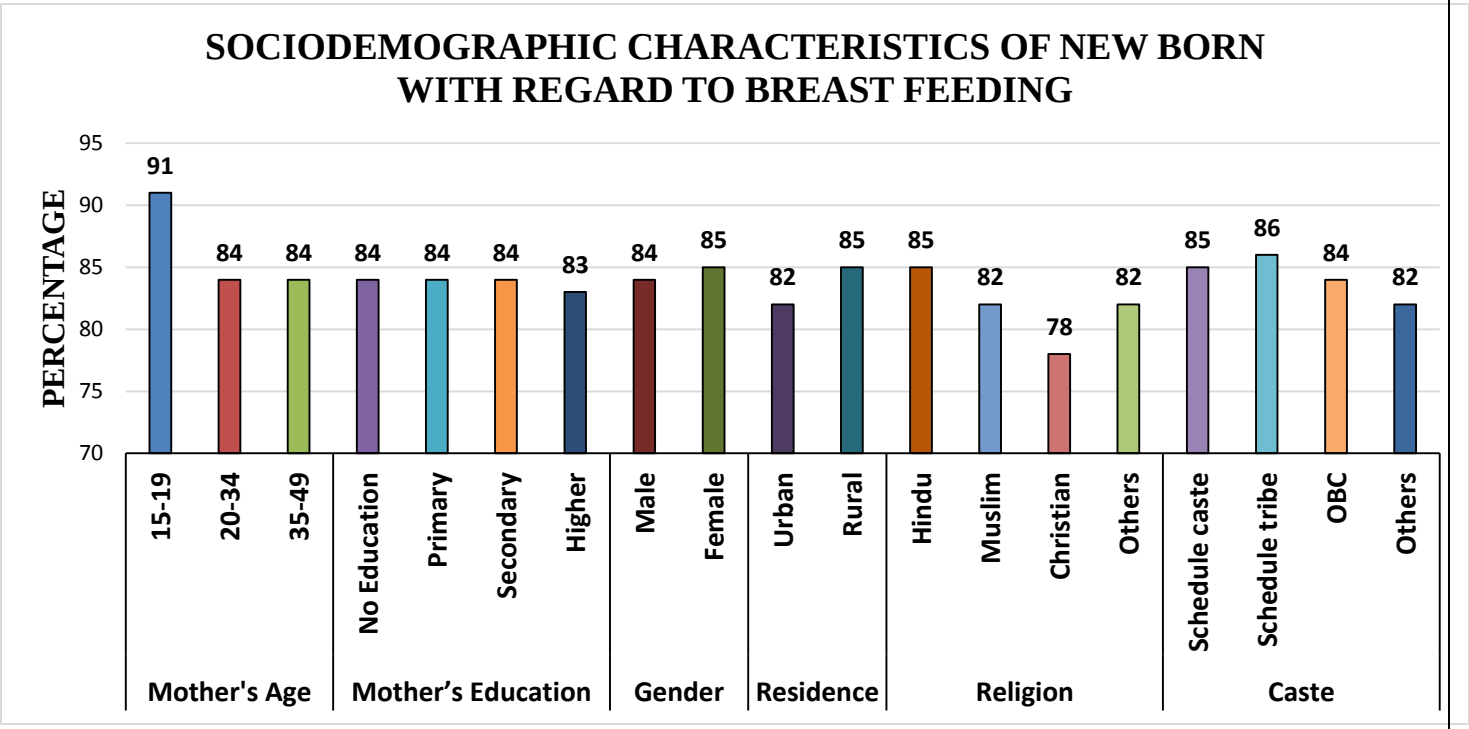
Factors Associated with Exclusive Breastfeeding (EBF) Status

The association analysis of various socio demographic and maternal characteristics with exclusive breastfeeding (EBF) status is presented in Table 3. EBF was found to be significantly associated with the following factors:

1. **Mother's Age:**
    - Mothers aged 20-34 years were significantly more likely to practice EBF in comparison to those aged 15-19 years, with an odds ratio (OR) of 1.87 (95% CI: 1.52-2.31, P < 0.001).
    - Mothers aged 35-49 years also had higher odds of EBF in comparison to the 15-19 years age group, with an OR of 1.77 (95% CI: 1.34-2.35, P < 0.001).
2. **Mother's Level of Education:**
    - No significant differences were observed in EBF rates based on the mother's education level. The ORs for primary, secondary, and higher education compared to no education were 1.00 (95% CI: 0.85-1.17, P = 0.973), 0.933 (95% CI: 0.83-1.04, P = 0.242), and 1.07 (95% CI: 0.90-1.27, P = 0.411), respectively.
3. **Gender of the Infant:**
    - Female infants were slightly less likely to be exclusively breastfed in comparison to male infants, with an OR of 0.90 (95% CI: 0.82-0.99, P = 0.035).
4. **Regions:**
    - Compared to the North region, the South region had higher odds of EBF, with an OR of 1.56 (95% CI: 1.34-1.82, P < 0.001).
    - The Central region had lower odds of EBF compared to the North, with an OR of 0.88 (95% CI: 0.77-0.99, P = 0.041).
    - The Northeast region showed significantly higher odds of EBF compared to the North, with an OR of 1.61 (95% CI: 1.37-1.89, P < 0.001).

This analysis highlights several significant factors associated with exclusive breastfeeding. The maternal age, type of residence and regional differences play critical roles in determining EBF rates. Notably, educational attainment and place of delivery do not significantly impact

EBF status, suggesting that interventions to promote EBF may need to focus more on age, location, and regional strategies.



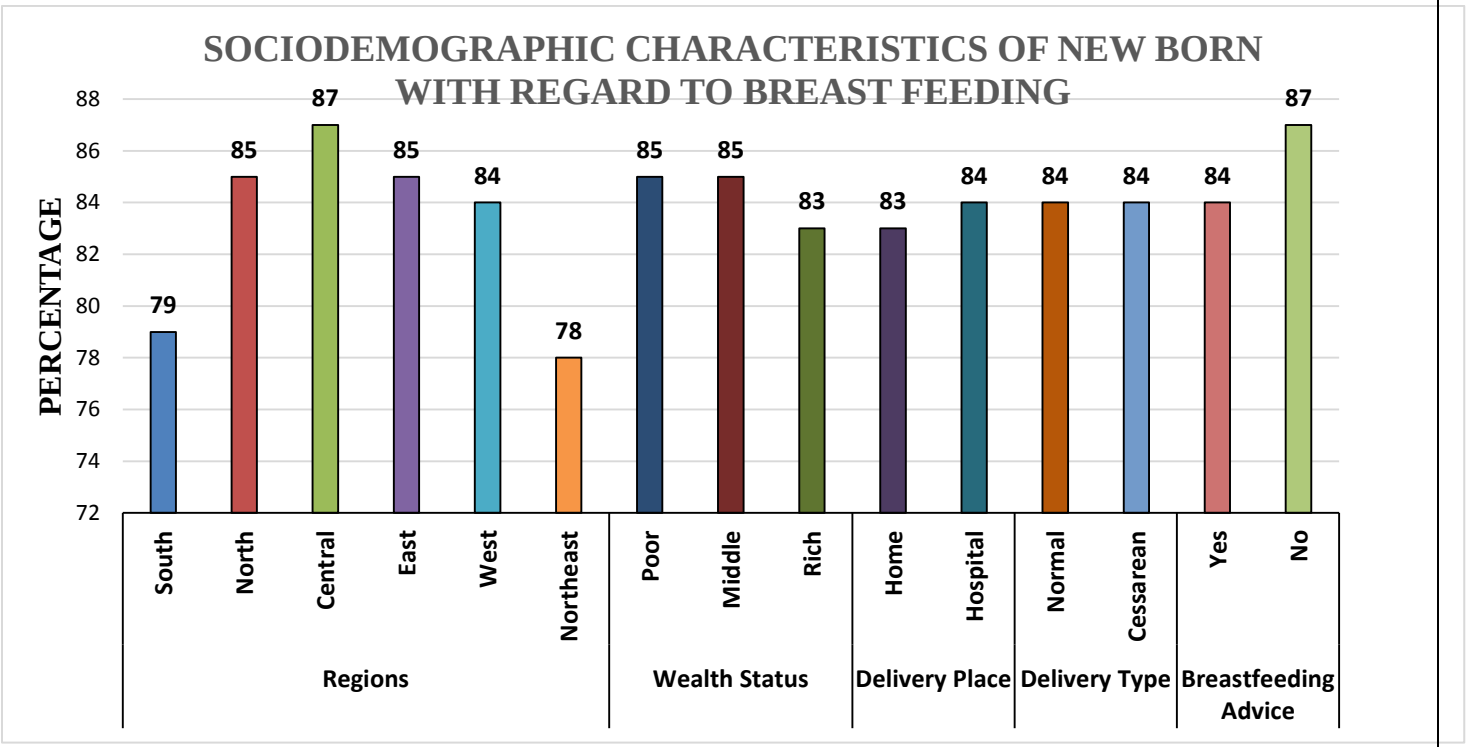


Table 2: Association between Breastfeeding status and other variables

Characteristics	**EBF**	**Non-EBF**	
	95% CI	**95% CI**	**P-value**
Mother's Age (in years)			
15-19	0.89- 0.91	0.08- 0.10	0.000
20-34	0.83- 0.84	0.15-0.16	
20-34	0.82-0.86	0.13- 0.17	
Mother's Level of Education			
No education	0.82-0.84	0.15-0.17	0.027
Primary	0.82-0.85	0.14-0.17	
Secondary	0.84-0.85	0.14- 0.15	
Higher	0.81-0.84	0.15-0.18	
Gender			
Male	0.82-0.84	0.15-0.17	0.456
Female	0.84-0.85	0.14-0.15	
Type of Residence			
Urban	0.81-0.82	0.17-0.18	0.016

Rural	0.84-0.85	0.14-0.15	
Regions			
South	0.77-0.80	0.19-0.22	0.000
North	0.84-0.86	0.13- 0.15	
Central	0.86-0.87	0.12-0.13	
East	0.83- 0.85	0.14- 0.16	
West	0.82-0.85	0.14- 0.17	
Northeast	0.75- 0.80	0.19-0.24	
Wealth Status			
Poor	0.84-0.85	0.14- 0.15	0.868
Middle	0.84-0.85	0.14- 0.15	
Rich	0.81-0.83	0.16-0.18	
Place of Delivery			
Home	0.81-0.84	0.15-0.18	0.000
Hospital	0.83- 0.84	0.15-0.16	
Type of Delivery			
Normal	0.83- 0.84	0.15-0.16	0.557

Cessarean	0.82-0.84	0.15-0.18	
Advice on Breastfeeding			
Yes	0.83- 0.84	0.15-0.16	0.026
No	0.85-0.88	0.11-0.14	

SECTION 5

DISCUSSION:

The analysis of factors associated with exclusive breastfeeding (EBF) status reveals several significant associations. Mother's age plays a notable role, with mothers aged 20-34 and 35-49 having higher odds of exclusive breastfeeding compared to those aged 15-19, with odds ratios (OR) of 1.87 and 1.77, respectively, both with p-values less than 0.001, the timing of breastfeeding initiation is significantly influenced by several factors including a woman's educational level, economic status, caste or tribe, place of delivery, prenatal visits to healthcare facilities, and assistance during delivery. Additionally, a partner's controlling and violent behavior also plays a crucial role.(13) According to a publication, in Uttar Pradesh, around 24% of women who gave birth in a health facility began breastfeeding within the first hour, compared to 16% of those who delivered at home.(14)

Educational attainment does not show a strong correlation with EBF status, as mothers with primary, secondary, and higher education have ORs close to 1 and non-significant p-values. However a recent studies shows that there is growing awareness that optimal complementary feeding relies not just on the food itself, but also on the manner, timing, location, and person responsible for feeding the child.(11)

Residence type is influential; rural mothers are less likely to exclusively breastfeed in comparison to urban mothers (OR = 0.81, $p < 0.001$). Behavioral research has shown that in some populations, a "laissez-faire" approach to feeding is common, with encouragement to eat being rare and usually only occurring when children refuse food or are unwell.(11)

Gender of the child also affects EBF, with female children being slightly less likely to be exclusively breastfed in comparison to males (OR = 0.90, $p = 0.035$). A study states that Women who have not faced husband violence during pregnancy are having more chances to begin breastfeeding than those who have experienced such violence. Unfortunately, domestic violence and gender-based violence are quite prevalent in India, with a significant social acceptance of these issues. Consequently, it is crucial to study the impact of a partner's behavior on the initiation of breastfeeding.(13)

Regional differences are evident, with mothers in the South and Northeast regions having higher odds of exclusive breastfeeding in comparison to mothers in the North, while mothers in the

Central region are slightly less likely (OR = 0.88, p = 0.041). The place and type of delivery do not show significant associations with EBF, as indicated by their respective ORs and p-values. Overall, these findings highlight that maternal age, child's gender, type of residence, and regional factors are significant determinants of exclusive breastfeeding practices

The highest EBF rate was observed in the Central region (87%), while the Northeast had the lowest (78%), with significant regional variation (p = 0.000). Aruldas et al also published that in Uttar Pradesh about 24 % of women who gave birth in a healthcare facility initiated breastfeeding within 1 hour in comparison to 16 percent who gave birth at home.(14)

This disparity could be due to regional differences in health infrastructure, breastfeeding promotion programs, and socio-cultural norms. Large-scale population-based surveys, such as the Multiple Indicator Cluster Survey (MICS) and the Demographic and Health Survey (DHS), can be used to evaluate indicators. (15)

Few findings indicate that overlapping inequalities exist in EBF based on religion, education of the mother, social class (economic status), and place of residence. Factors like being from rural parts, higher education level of mothers, and the Hindu religion seem to have positive impact on exclusive breastfeeding prevalence where as higher wealth index and urban living were likely to decrease the EBF among the child below six months.(8)

The findings of the systematic review indicate that exclusively breastfeeding child with only breast milk, and no additional foods or liquids, for six months offers several benefits compared to exclusive breastfeeding for 3 to 4 months subsequently followed by mixed feeding according to WHO.

EBF rates were similar across wealth categories: poor (85%), middle (85%), and rich (83%), with no significant association (p = 0.868). This suggests that wealth status alone does not significantly impact breastfeeding practices, indicating the effectiveness of broad-based breastfeeding promotion initiatives.

SECTION-6

Conclusion:

The analysis underscores the multifaceted nature of factors influencing exclusive breastfeeding practices. Younger age, rural residence, specific regions (particularly the Central region), hospital delivery, and receiving breastfeeding advice were positively associated with higher EBF rates. Conversely, educational level, wealth status, and infant gender showed minimal variation in EBF rates. These insights are critical for designing targeted interventions to promote exclusive breastfeeding, addressing specific demographic segments, and enhancing breastfeeding support and education across different socio-demographic contexts. Future research should further explore the underlying mechanisms driving these associations to inform more effective public health strategies.

Regions and Exclusive Breastfeeding (EBF) Rates

Regional Variation in EBF Rates: The data indicates significant regional differences in EBF rates ($p = 0.000$), suggesting that regional factors play a crucial role in breastfeeding practices. The highest EBF rate was observed in the Central region (87%), while the Northeast region had the lowest EBF rate at 78%. These regional disparities highlight the impact of localized health infrastructure, cultural norms, and breastfeeding promotion programs.

Central Region (87% EBF): The Central region& high EBF rate could be attributed to several factors. This region might have more effective breastfeeding promotion programs, better healthcare infrastructure, and higher levels of support for new mothers. Community health workers and local health initiatives might be more active and effective in promoting EBF. Additionally, cultural practices in this region may strongly support and encourage breastfeeding.

Northeast Region (78% EBF): In contrast, the Northeast region & lower EBF rate could reflect several challenges. This area might face issues such as less accessible healthcare services, lower levels of breastfeeding promotion, and possible cultural or societal barriers to exclusive breastfeeding. Geographic isolation and socio-economic factors may also contribute to these lower rates, making it harder for mothers to receive the support and education needed for EBF.

Other Regions: The remaining regions (South, North, East, and West) show EBF rates varying between 79% and 85%, indicating moderate success in breastfeeding practices.

The findings highlight the significant influence of socio-demographic factors on exclusive breastfeeding practices. Younger age, rural residence, certain regions (like the Central region), hospital delivery, and receiving breastfeeding advice were positively associated with higher EBF rates. On the other hand, educational level, wealth status, and gender showed less variation in EBF rates. These insights can inform public health strategies to promote exclusive breastfeeding by targeting specific demographics and enhancing breastfeeding support and education.

SECTION-7

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