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Socio-Economic Differential in Breastfeeding Status and its Impact on Child Health in India: Evidence from NFHS-3.

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Abstract

Background: Breast milk provides all the nutrients an infant needs during the first few months of life, as well as immunological agents that protect against disease. Breastfeeding is one of the most effective ways to ensure child health and survival. Globally, less than 40% of infants below six months of age are exclusively breastfed.

Objective: This study is an attempt to present the comparable results on breastfeeding differentials in India and Bangladesh using DHS data. It is also being tried to compare the prevalence of selected diseases in infants according to their breastfeeding status.

Method: This study has included six outcome variables namely exclusive breastfeeding, predominant breastfeeding, partial breastfeeding, acute respiratory infection, diarrhoea, fever. Bivariate analyses, Chi-square test and binary logistic regression models were used.

Findings: Predominant and exclusive breastfeeding shows protective effect with the childhood diseases. The birth order of the child, place of delivery and delivery method has a significant effect on breastfeeding practices in selected countries.

Conclusion: Although the breastfeeding is universal in South Asia, but the practice of exclusive and predominant breastfeeding need to be promoted, it may significantly reduce childhood morbidity and mortality and improve the overall health situation of infants.

Keywords: Breastfeeding, Child Health, Diseases, ARI, Diarrhoea, fever etc

Introduction

Background: Children are considered the most vulnerable group in the population. In developing countries Infectious diseases like diarrhoea, acute respiratory infections are the main cause of morbidity and mortality among infants aged one year. There are many factors which affect child health, but breastfeeding is one of the factors which take main and important part in the health of the child. If the child is not breastfed for first few months of life, the chance of getting bacterial and viral infections are very high. Breast milk not only provides important nutrients but also built immunity in the infants from these infections. In order to improve the child survival, there is a global interest in increasing the rates of optimal infant and young child feeding practices, especially the exclusive breastfeeding for the first six months. In 2012, the UN Secretary General's Global Strategy for Women's and Children's Health has set a specific target in 49 least developed countries, for increasing exclusive breastfeeding to the 21.9 million infants for the first six months of life, by 2015. The World Health Organization in 2012 also, set a global target to increase exclusive breastfeeding rates in the first six months of life by at least 50 percent. This target implies that the current global average, estimated to be 37 percent for the period 2006–2010, should increase to 50 percent by 2025. No more than 35 percent of infants worldwide are exclusively breastfed during the first four months of life; complementary feeding frequently begins too early or too late, and foods are often nutritionally inadequate or unsafe. Malnourished children who survive are

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more frequently sick and suffer life-long consequences of impaired development. Because poor feeding practices are a major threat to social and economic development, they are among the most serious obstacles to attaining and maintaining health that face this age group' (Global Strategy 2002).

Breastfeeding is very useful for the health of the mother and child and it also prevents the childhood diseases. Longer breastfeeding has also been linked with good mental health through childhood and into adolescence. The experts agreed that breastfeeding is very advantageous for child health and have a matter of interest about the artificial formulas. Breastfeeding is the normal way of providing young infants with the nutrients they need for healthy growth and development. It is one of the most effective ways to ensure child health and survival. If every child was breastfed within an hour of birth, given only breast milk for their first six months of life, and continued breastfeeding up to the age of two years, about 220 000 child lives would be saved every year. Globally, less than 40% of infants under six months of age are exclusively breastfed (WHO). The first milk which is called "colostrum" is the most suitable food for the baby during this early period because it contains a high concentration of protein and other nutrient the body needs; it is also rich in anti-infective factors which protect the baby against respiratory infections and diarrheal diseases. Supplementary feeds are not necessary (Park & Park). "The Colostrum, the yellowish, sticky breast milk produced at the end of pregnancy, is recommended by WHO as the perfect food for the newborn, and feeding should be initiated within the first hour after birth. (WHO) Through breastfeeding, all the children's nutritional requirements are fulfilled both in quantities and in composition especially for the first few months of life. This is one of the reasons which make breastfeeding as an important issue in the concern of health related institutions in developed and developing countries. Breastfeeding has been one of the important subjects of growing interest because of its implication not only for the improved health of the children but also for reducing fertility. The suckling infant stimulates the flow of hormones within the mother which delay the return of ovulation. The prolonged breastfeeding lengthens the post-partum amenorrhea and thus increase the duration of birth interval, which reduce fertility indirectly (Arokiasamy,P. (2002). The extensive literature is available, which focuses on the importance of the exclusive breastfeeding. Psychologists have postulated that breastfeeding promotes "bonding" between mother and baby, although more definite research on this topic is needed (Morgan, 1981; Post and Singer, 1983). According to Ferry and Smith, in the South Asian countries, the pace of change in breastfeeding (measured in terms of initiation and duration) appears to be only modest. However, the differentials between urban and rural populations have been widening over time, suggesting that in urban areas, initiation and/or duration of breastfeeding are declining more rapidly. The components of breast milk are a major contributor to decreased morbidity rates in breastfeeding infants. The breast milk contains Oligosaccharides, Immunoglobulin A (IgA) and other immune cells which protects the child from the infection. IgA comprises one aspect of breast milk that provides protection to infants from infection. These elements of breast milk provide a protective mechanism from childhood

illness such as gastroenteritis and pneumonia. Human milk contains an extensive amount of Oligosaccharides. It prevents the attachment of *Streptococcus pneumoniae* and *Haemophilus influenzae*. Lactoferrin is the third important component of breast milk which contains the microbicidal effects. Microbicidal agents killing the bacteria and viruses (Hanson.et al. (2002). Child survival depends upon adequate nutrient intake and the ability of a child to resist or recover from infections. Breast milk can provide the major nutrient source in a child's diet. It can also be an important contributor to the child's immunologic defence system, increasing resistance to disease. The consumption of breast milk in place of other food sources that may be contaminated reduces the ingestion of certain infectious agents (Picciano, 2001). Breastfeeding can also contribute to child survival through extending the period of postpartum anovulation, through postpartum abstinence, and by lengthening intervals between births. Enhanced birth intervals have been associated with improvements in child survival (Gray, 1981). Breast milk is an amazing substance that cannot be duplicated by any artificial means. Unique in its composition and function, breast milk contains an ideal balance of nutrients that the infant can easily digest and changes over time, and even over the course of a day, to meet the changing needs of the growing child. Breast milk contains substances essential for optimal development of the infant's brain, with effects on both cognitive and visual function. It supplies growth factors that combine to mature the infant's gut. It also provides the infant with immune factors manufactured to fight allergens and illnesses specific to the mother's and infant's environment (Heinig.et al. 2001, Picciano.et al. 2001).

Objectives

The present study is an attempt to show the socioeconomic differential in breastfeeding status of mothers and to understand the effect of breastfeeding on child health.

Data

The Data for the study was taken from National Family Health Survey (NFHS-3) which were collected by "International Institute for Population Sciences", Mumbai during 2005-06. NFHS-3 collected information from a nationally representative sample of 124,385 women age 15-49, aimed to provide estimates on family welfare, maternal and child health, nutrition and other health care indicators.

Methodology

The present study has included six outcome variables namely exclusive breastfeeding, predominant breastfeeding, partial breastfeeding, acute respiratory infection, diarrhoea, fever. Bivariate analyses, Chi-square test and binary logistic regression models were used. The breastfeeding status was estimated by the following characteristics:

Socio-economic variables

(a) Mother's education, (b) Mother's occupation, (c) Place of residence, (d) Wealth quintile, (e) Religion

Demographic variables

(a) Age of mother, (b) Birth order, (c) Sex of the child

Maternal health variables

(a) Place of delivery, (b) Delivery methods

Dependent Variables

For the first objective the dependent variables are Exclusive Breastfeeding (Yes=1; otherwise=0), Predominant Breastfeeding (Yes=1; otherwise=0) and Partial Breastfeeding (Yes=1; otherwise=0). For the second objective the dependent variables are the selected diseases i.e. Acute respiratory infection (having disease=1; otherwise=0), Diarrhea (having disease=1; otherwise=0) and Fever (having disease=1; otherwise=0).

Statistical Analysis

Cross tabulation was done for each dependent variable with all independent variable and this provides the prevalence of breastfeeding by background characteristics of the mother. Finally, binary logistic models were fitted to access the adjusted effect of the socio-economic, demographic and cultural characteristic on the likelihood of breastfeeding status. It is also used in the second objective, to understand the linkages of breastfeeding practices and occurrence of childhood diseases. Binary Logistics Regression model has been used to understand the linkages of breastfeeding feeding status having a statistically significant effect on the likelihood of occurrence of selected diseases (having disease=1; otherwise=0). All the analysis has been carried out using SPSS-20 Software.

Definitions used

Exclusive Breastfeeding: It was defined as the infant receive only breast milk only and no other solids or liquids with the exception of vitamins, minerals, medicines and oral rehydration solution up to the age ≤ 6 months. It means infants who received nothing but breast milk, up to age ≤ 6 months, are classified as being exclusively breastfed

Predominant Breastfeeding: It was defined when the infant receives breast milk and water, water-based liquids such as juice, liquids but not infant formula. It means either exclusively breastfed or received breast milk and plain water, and/or non-milk liquids only up to age ≤ 6 months.

Partial Breastfeeding: It was defined when the infant received breast milk with other solid and semi-solid food such as infant formula, grains, beans, vegetables, meat etc. It means either breastfed or received solid or semisolid foods, for the last child who was currently breastfed, aged >6 to 23 months.

Results

Table 1 represents the Prevalence of breastfeeding practices by the socio-demographic characteristic of mother for India. The age of respondent showed a similar pattern in all the categories of breastfeeding practices. The proportion of breastfeeding was high in the 15-24 years age group of the mother (i.e. 59 %, 56 % and 48 % respectively) and it is low in the 35- 49 years age group of the mother (i.e. 5 %, 5 % and 7 % respectively). The difference in the proportion of exclusive and predominant breastfeeding was found high in the age group 15-24 years to 25-34 years which was almost 12 percentage point and this difference was very less in partial breastfeeding, only 2 percent. A negative association was found between breastfeeding practices and education. Exclusive breastfeeding is highest in the no

education group along with predominant and partial breastfeeding; it was lowest in the higher education group. The proportion of breastfeeding was very less in the exclusive, predominant and partial, in the category of primary education as compare to secondary education. The occupation has also a negative association with breastfeeding. In the non-working women category, around 70% women have breastfed their children in both exclusive and predominant breastfeeding. In the partial category, it was slightly less i.e. 65 %. Exclusive and predominant breastfeeding was little less than 10% in the non-agricultural work category; it was just over 10 % in the partial breastfeeding. Religion showed a similar association with the breastfeeding practices in all the categories. In Hindus, the exclusive, predominant and partial breastfeeding was over 75 %. Among Muslims, it was almost 17 % and among other religion, it was below 5 %. First and second order child received almost 30% of breast milk in their respective categories i.e. exclusive, predominant and partial. It was very less in the third order child (17 %). The prevalence of breastfeeding was high among male child as compared to the female child. The male child received almost 51 % of exclusive, predominant breastfeeding and 53 % partial. The rural place of residence has a high percentage of breastfeeding in the categories of breastfeeding; it was almost three times high in rural areas as compared to urban areas. The Prevalence breastfeeding practices decrease with the increase in the order of wealth quintile. The breastfeeding practices was high in the poorest category (i.e. exclusive=27%, predominant=25% and partial=24) and it was very low in the richest category (i.e. exclusive=11%, predominant=15% and partial=16). The place of delivery and delivery method also affects the breastfeeding practices. The breastfeeding practices were 3 times high in the child who delivered at home instead of Institutional deliveries. The breastfeeding practices were 9 times high in the women who had non-caesarian deliveries.

Table 1: Differential in breastfeeding status by background characteristics of mothers in India

Background Characteristics	Exclusive ¹	Predominant ²	Partial ³
Age of Respondent			
15 - 24	58.76	56.4	47.56
25 - 34	36.22	38.38	45.43
35 - 49	5.02	5.23	7.01
Educational Status			
No education	48.66	45.57	47.13
Primary	16.09	15.23	13.6
Secondary	30.41	32.43	33.31
Higher	4.84	6.77	5.96
Occupation			
Non-worker	69.72	70.24	65.37
Agricultural	22.04	21.05	23.89
Non-agricultural	8.25	8.71	10.74
Religion			
Hindu	78.47	78.88	78.19
Muslim	17.24	16.53	17
Others	4.29	4.59	4.81
Birth Order			
One	29.98	30.49	29.11
Two	29.17	29.99	28.35
Three	16.69	16.41	16.64
Three +	24.16	23.11	25.9
Sex of the Child			
Male	50.77	51.11	53.34

Female	49.23	48.89	46.66
Residence			
Urban	21.96	24.9	26.5
Rural	78.04	75.1	73.5
Wealth Quintile			
Poorest	27.35	25.2	24.26
Poorer	24.96	23.69	21.75
Middle	19.59	18.53	19.46
Richer	16.76	17.66	18.59
Richest	11.34	14.93	15.94
Place of delivery			
Home deliveries	60.35	57.46	58.21
Institutional Deliveries	39.65	42.53	41.79
Delivery Method			
Non-caesarian	90.59	89.6	90.48
Caesarian	9.41	10.4	9.52
Total	46.67	50.5	94.24

Note: ¹Children who received nothing but breast milk, up to age <= 6 months, are classified as being exclusively breastfed, ²Either exclusively breastfed or received breast milk and plain water, and/or non-milk liquids only, aged <=6 months. & ³Either breastfed or received solid or semisolid foods, aged >6 to 23 months.

Table 2 represents the prevalence of diseases by exclusive, predominant and partial breastfeeding in India. From the table it evident that the prevalence of diseases (i.e. ARI, diarrhoea and fever) were very low in the exclusively breastfed children as compared to predominant & partial breastfed child. The prevalence of diseases was high in the partial breastfeeding in India. In the partial breastfed children prevalence of ARI & Diarrhea was almost 6.5 times high (i.e.70.2% respectively) as compared with exclusive and partial breastfed children. The prevalence of ARI & diarrhoea was almost same in exclusively breastfed children in India (i.e. 10.7% and 10%). The same pattern was found in predominant breastfeeding with ARI & diarrhoea. The prevalence of fever was high in partial breastfeeding (80.2%), followed by partial breastfeeding (9.2%), and exclusive breastfeeding (8.1%).

Table 2: Prevalence of diseases by breastfeeding status in India

Breastfeeding status	Acute Respiratory Infection(ARI)	Diarrhoea	Fever
Exclusive	10.7	10.0	8.1
Predominant*	11.3	11.0	9.2
Partial**	70.2	70.2	80.2

Children who received nothing but breast milk, up to age <= 6 months, are classified as being exclusively breastfed. *Either exclusively breastfed or received breast milk and plain water, and/or non-milk liquids only. ** Either breastfed or received solid or semisolid foods. For the last child who was currently breastfed, * age <=6 months & ** aged >6 to 23 months.

Table 3 represents the crude and adjusted associations between exclusive, predominant and partial breastfeeding practices for ARI, diarrhoea and fever for India. The analysis shows that children are 19 % less likely to suffer from ARI with exclusive breastfeeding as compared to non-exclusive breastfeeding. After adjusting the independent effect of exclusive breastfeeding for maternal age, maternal education, sex of the child and wealth quintile, the children are 22% less likely to suffer from ARI. The acute respiratory infection is 22% less likely to occur in the predominant breastfed children as compared to other. After adjusting the independent effect of predominant breastfeeding it does not show any change. Children are 16 % more likely to get ARI with partial breastfeeding as compared with the other breastfeeding practices. After adjusting the independent effect of partial breastfeeding the chance of getting ARI is 15% more likely in children. The chance of suffering from diarrhoea is 22% less likely among exclusively breastfed children, as compared to their other counterparts. After adjusting the independent effect of EBF, the chance having diarrhoea is 15% less likely, as compared to others. Predominantly breastfed children are 16% less likely to suffer from diarrhoea with respect to other breastfed children. After adjustment in the independent effect of predominant breastfeeding, children are 19% less likely to get diarrhoea. Children are 84% more likely to suffer from diarrhoea in the partial breastfeeding with respect to others. After adjusting the effects, it is 80% more likely to get diarrhoea. Exclusive breastfeeding children are 31% less likely to suffer from fever with respect to non-exclusive breastfeeding. After adjusting the independent effect of exclusive breastfeeding it does not show a significant difference. Similarly, predominant breastfed children are 25% less likely to suffer from fever with respect to other breastfeeding practices. Partially breastfed children are 13 % more likely to suffer from fever with respect to as compared to others. After adjusting the independent effect of partial breastfeeding by maternal age, education, occupation, sex of the child and wealth quintile, it does not show very much effect on fever.

Table 3: Odds ratio showing the effect of breastfeeding status on childhood diseases in India

ARI						
Breastfeeding Status	Crude			Adjusted		
	OR	(95% CI)	P-Value	OR	(95% CI)	P-Value
Exclusive	0.809	(0.677 to 0.967)	0.02	0.778	(0.650 to 0.930)	0.006
Predominant *	0.784	(0.662 to 0.927)	0.005	0.77	(0.650 to 0.912)	0.002
Partial **	1.159	(1.058 to 1.270)	0.002	1.146	(1.044 to 1.259)	0.004
Diarrhea						
Breastfeeding Status	Crude			Adjusted		
	OR	(95% CI)	P-Value	OR	(95% CI)	P-Value
Exclusive	0.78	(0.666 to 0.912)	0.002	0.749	(0.749 to 0.640)	0
Predominant *	0.835	(0.724 to 0.962)	0.013	0.814	(0.706 to 0.939)	0.005
Partial **	1.844	(1.690 to 2.013)	0	1.806	(1.652 to 1.974)	0
Fever						
Breastfeeding Status	Crude			Adjusted		
	OR	(95% CI)	P-Value	OR	(95% CI)	P-Value
Exclusive	0.689	(0.610 to 0.779)	0	0.685	(0.606 to 0.774)	0

Predominant*	0.754	(0.675 to 0.841)	0	0.753	(0.675 to 0.841)	0
Partial **	1.129	(1.064 to 1.198)	0	1.135	(1.068 to 1.206)	0

Children who received nothing but breast milk, up to age ≤ 6 months, are classified as being exclusively breastfed. *Either exclusively breastfed or received breast milk and plain water, and/or non-milk liquids only. ** Either breastfed or received solid or semisolid foods. For the last child who was currently breastfed, * age ≤ 6 months & ** aged >6 to 23 months.

Conclusion

There are many socio-economic and demographic inequalities in the breastfeeding practices according to the country's socio-economic and demographic profile. Exclusive and predominant breastfeeding shows the protective effect as compared to partial breastfeeding, on ARI, diarrhoea and fever in first six months of life. Partially breastfed infants had a higher prevalence of diseases than the others. The breastfeeding practices vary according to the mother's age, education, occupation. The birth order of the child also shows a significant effect on breastfeeding. The male child is in advantage position in breastfeeding practices as compared to their female counterparts. Place of delivery and delivery method also have a significant effect on breastfeeding practices in India. Although the breastfeeding is universal in India, the practice of exclusive and predominant breastfeeding need to be promoted, it may significantly reduce childhood morbidity and mortality and improve the overall health situation of infants.

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