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The socio-economic determinants of exclusive breastfeeding: A cross-sectional study conducted in Dhaka city, Bangladesh

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Abstract
Background: Breast milk is the essential food under the 6 months of the children. The WHO and UNICEF recommended the rate of exclusive breastfeeding must be 90% for children less than 6 months. It is scientifically proven that exclusive breastfeeding is important for children younger than 6 months.
Methods: A cross-sectional study was conducted in 2019 in EPI centers of both private and public hospitals in Dhaka city, Bangladesh. A semi-structured questionnaire was used to collect data from 257 breastfeeding mothers. Informed consent was taken from the participants before enrolment into the study and interviewed.
Results: The rate of exclusive breastfeeding in Dhaka city was 63.42%. Out of 257 respondents, 163 respondents provided exclusive breast milk. The maternal age, family income, employment status, gender of the baby, post-natal care, birthplace, birth weight, birth order, ante-natal care, family member, the age gap between the breastfeeding child and the previous child were determined the exclusive breastfeeding.
Conclusions: The rate of exclusive breastfeeding varied from area to area. The exclusive breastfeeding practices related to the different factors where the exclusive breastfeeding is hampered by the factors like employment status, higher income and higher education level.
Key words: Exclusive breastfeeding, family income, maternal education, Dhaka city, Bangladesh.

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I. INTRODUCTION

Exclusive breastfeeding (EBF) is critical for the newborn's health and wellbeing. UNICEF and WHO recommended that the breast milk of the mother is important for the children younger than 6 months. During this period, no other liquids or breastfeeding substitutes should be given except for medicine or oral rehydration solution[1]. For the supply of nutrients, including vitamins and minerals, breast milk is enough for nourishment during the first 6 months[2]. Exclusive breastfeeding practice is found to play a significant role in reducing child deaths and hospitalization from diarrhea, RI (respiratory infections), and otitis media illness which contributing to the health in the long run. A study (2016) revealed that breastfeeding could save more than 0.8 million lives of under-five children every year[3]. Besides, early initiation within the first hour, breastfeeding is found to have a profound impact to prevent neonatal mortality[4] whereas mortality, as well as deaths, were related to undernutrition and suboptimum breastfeeding practices. It was estimated that sustained breastfeeding practices beyond six months, escorted by satisfactory quantities of nutritionally adequate, harmless, and proper solid, semi-solid and indulgent foods, also helps safeguard decent nutritional status and shelters against illnesses. Stunting, severe wasting, and intrauterine growth constraint were accountable for 2.2 million deaths and 21% DALYs for the children earlier than five years in the developing countries[5]. In lower-middle-income countries (LMICs), only 37% of children under 6 months were exclusively breastfed[3]. Notwithstanding the well-defined necessity of exclusive breastfeeding practices on children's health and wellbeing, the rate of EBF was lower in the developing countries which were 39% in 2010[6].

In Bangladesh, a study showed the prevalence of exclusive breastfeeding was 56.2 percent[7] at the same time according to BDHS, the prevalence of EBF was 56.4 percent in 2011[8] whereas the NIPORT report found that the prevalence of exclusive breastfeeding was 55 percent from 1993-2011 and it remained 51 percent in 2014[9].

In Ghana, the rate of exclusive breastfeeding was 64% where the marital status, region, and place of delivery were found to be linked with the drill of exclusive breastfeeding[10]. In Sri Lanka, the actual EBF rate was 65.9 percent where the younger mother's breastfed more compared to mothers older than 30 years where the majority of the children were not exclusively fed breast milk still continual to have breast milk. Firstborn

babies had a lower rate of EBF compared to second-born babies[11] and the rate of exclusive breastfeeding was very low due to different points of healthcare delivery, mother's poor attitudes towards exclusive breastfeeding cultural practices, maternal employment status[12].

In Vietnam, C-section and neonatal complications were the consequence of low exclusive breastfeeding during hospital stay[13]. In Zhejiang, the overall rate of exclusive breastfeeding was 50.3%. But it was 38 percent in the city, 63.4 percent in suburban areas, and 61 percent in rural areas where the vaginal birth, family income, maternal education level, baby's first feed being breast milk, younger age of mother and mother living in the suburbs or rural areas were determined the rate of exclusive breastfeeding practices[14].

In Nigeria, only 19 percent of the nursing mothers practiced exclusive breastfeeding where the barriers to exclusive breastfeeding were the perception that babies continued to be hungry after breastfeeding, maternal health problem, fear of babies becoming addicted to breast milk, pressure from the mother-in-law, pains in the breast, and the need to return to work[15]. Another study found no significant association between education and EBF but the rate of exclusive breastfeeding increased by way of considering the birth order[16]. Similarly, the American Academy of Pediatrics found that parity significantly associated with exclusive breastfeeding[17]. In Egypt, the maternal age, childbirth order, being a primipara, single marital status, preterm infant, and complicated labor were determined the practice of exclusive breastfeeding[18].

In Gujarat, India where parity, inter-delivery interval, mode of delivery, birth weight, maternal age, types of family, socioeconomic structure, maternal education, paternal education, and occupation were related to exclusive breastfeeding though the practices of EBF were not better position compared to national level[19]. Another study in Jharkhand, India which revealed maternal age, place of delivery, distance from the health facility, and sex of the new-born were significantly associated with exclusive breastfeeding[20].

Based on the evidence from Ethiopia, most of the infants were not exclusively breastfed during the first 6 months. The age of mothers, religion, ethnicity, educational status of mothers, marital status, occupation of mothers, place of residence, sex of baby, and age of infants, maternal employment status and age of infants were significantly associated with exclusive breastfeeding[21]. Another study found the rate of exclusive breastfeeding was 2.8 times higher among infants whose mothers were aged between 36-45 compared to those whose mothers were younger[22]. It was higher in those who had normal delivery compared to C-section[23].

A study in Ghana had found the educational status, age, and ethnicity of mothers were significantly associated with maternal breastfeeding practices[24]. Mothers who delivered at the hospital had higher rates compared to mothers who delivered at home[10]. In Malaysia, exclusive breastfeeding was positively associated with rural residence, Malay mothers, non-working and non-smoking mothers, multiparous mothers, term infants, mothers with husbands who supported breastfeeding, and mothers who practiced bed-sharing[25].

One researcher revealed the rate of exclusive breastfeeding was lower in the rustic area of Karnataka, India compared to national level rates where the mother thought that she had not enough milk[26]. A study conducted in Pakistan shown highly educated mothers more likely to practices bottle feeding in lieu of exclusive breastfeeding[27].

II. METHODS

Study Setting and Participant: A cross-sectional study was conducted based on the non-probability based convenience sampling as a sampling technique for the study. The rationale behind the selection of this technique was that all the women were not willingly participative because of the study being so sensitive. So during the data collection process, the conveniently accessible and willingly participative women were addressed for the study. The accessible population or sampling frame was in the EPI Centre of Pediatric department of both public and private hospitals in Dhaka city initially as it's not possible to address all the population of the study.

Data Collection and Analysis: Data were collected using a semi-structured questionnaire with face to face interview. The questionnaire was prepared with the help of the Bangladesh Health Survey (BDHS)-2014 and different journals questionnaire related to exclusive breastfeeding. Finally, we collected 257 respondents' information about breastfeeding under 6 months. The duration of the study was six months (January 2019 to June 2019).After collecting the data, we processed the data for the study. At first, we plotted the data into Microsoft Excel for checking and rechecking the data.

III. RESULTS

Socio-demographic characteristics: In the study, the table-01 represents the socio-demographic characteristics of the respondents. The average age of the participants was 27.95 years of which 55.25% of respondents aged 26-35 years. Only a few portions (7.01%) of the respondents were illiterate but most of the respondents had completed the secondary level of education. The majority of the respondents were engaged in the informal work. Most of the participants' (74.32%) family income was less than BDT 30,000 where the highest number of participants were in the income category BDT 11,000-30,000 or 55.25% of the total. The

average number of the family member of the participants was 4.20 with a 1.078 standard deviation. Furthermore, 58% of the participants' babies were male of which 56.03% of the babies had low birth weight where only 4.28% (11) babies had very low birth weight (≤1500g). Of the total, 71.60% of the participants were delivered babies at hospitals with a caesarian section of 47.86% of cases. Most of the participants received anti-natal care (ANC) during the pregnancy period. After delivery, they also received post-natal care (PNC) from different facilities. During the PNC visit, all of them were informed about exclusive breastfeeding. (See Table 1)

Table 1: Sociodemographic characteristics (n = 257)

Characteristics		Total (n=257)	
		Frequencies	Percentage
Maternal age	17-25	97	37.74
	26-35	142	55.25
	36-45	18	7.01
Maternal education	Illiterate	17	6.61
	Primary	41	15.95
	Secondary	159	61.87
	Tertiary	40	15.56
Maternal employment status	Employed	39	15.18
	Unemployed	218	84.82
Family income	Less than 11,000	49	19.07
	11,000-30,000	142	55.25
	31,000-100,000	56	21.79
	Above 100,000	10	3.89
Family member, mean (SD)		4.20 (1.078)	-
Gender of the baby	Boy	146	56.81
	Girl	111	43.19
Birth weight	Normal weight (> 2500 g)	113	43.97
	Low birth weight (≤ 2500 g)	144	56.03
Birth place	Home	73	28.40
	Hospital	184	71.60
Way of delivery	Normal	134	52.14
	C-section	123	47.86
ANC visit	Yes	227	88.33
	No	30	11.67
PNC visit	Yes	221	86.00
	No	36	14.00
Informed about BF during PNC visit	Yes	221	100.00
	No	0	0.00
First BF after birth	Within one hour	223	86.77
	More than one hour	34	13.23
Methods of feeding during first 6 months	EBF	163	63.42
	Combination	88	34.24
	Formula milk	6	2.33
If anything provided without BF	Yes	94	36.58
	No	163	63.42

Rate of exclusive breastfeeding: Table-02 provides a description of exclusive breastfeeding practices among different categories of variables. The study showed that the exclusive breastfeeding rate was 63.42% under 6 months in Dhaka city. The rate of exclusive breastfeeding (72.27%) was higher in the aged group 36-45 years. Participants who had a secondary level of education practiced more EBF compared to those who had a tertiary level of education or illiterate. The unemployed mother practiced more compared to the employed mother. Those who received ante-natal care and post-natal care practiced EBF more compared to those who didn't receive the care. Most of the participants who delivered at the hospital with normal delivery practiced a higher rate of exclusive breastfeeding. The rate of exclusive breastfeeding was 65.49% among the income group BDT 11,000-30,000. The rate was 67.26% among the normal birth weight infants. (See Table 2)

Table 2: Participants characteristics by practice of exclusive breastfeeding

Characteristics		Total (n=257)		
		Exclusive breastfeeding	Combination	Formula milk
Maternal age	17-25	56.70% (55)	41.23% (40)	2.07% (3)
	26-35	66.43% (95)	31.47% (43)	2.10% (3)
	36-45	72.27% (13)	27.78% (5)	0%
Maternal education	Illiterate	53% (9)	47.00% (8)	0%
	Primary	53.70% (22)	43.90% (18)	2.4% (1)
	Secondary	64.78% (103)	43.9% (51)	3.14% (5)
	Tertiary	52.5% (21)	47.5% (19)	0%
Maternal employment status	Employed	43.39% (17)	56.41% (22)	0%
	Unemployed	63.30% (138)	34.40% (75)	2.30% (5)
Family income	Less than 11,000	63.27% (31)	34.69% (17)	2.04% (1)
	11,000-30,000	65.49% (93)	33.10% (47)	1.41% (2)
	31,000-100,000	62.5% (35)	32.14% (18)	5.36% (3)
	Above 100,000	10% (1)	90% (9)	0%
Family member, mean (SD)		4.20 (1.078)	-	
Infant gender	Boy	61% (89)	36.30% (53)	2.70% (4)
	Girl	65.78% (73)	32.42% (36)	1.80% (2)
Birth weight	Normal weight (> 2500 g)	67.26% (76)	30.09% (34)	2.65% (3)
	LBW (≤ 2500 g)	60.42% (87)	37.50% (54)	2.08% (3)
Birth place	Home	64.38% (47)	34.25% (25)	1.37% (1)
	Hospital	62% (114)	35.33% (65)	2.72% (5)
Way of delivery	Normal	65% (87)	33.58% (45)	1.52% (2)
	C-section	56.91% (70)	39.84% (49)	3.25% (4)
ANC visit	Yes	65.20% (148)	33.04% (75)	1.80% (4)
	No	35.67% (11)	56.67% (17)	6.67% (2)
PNC visit	Yes	63% (139)	34.44% (76)	2.71% (6)
	No	69.44% (25)	30.56% (11)	0%
First BF after birth	Within one hour	64.13% (144)	34.53% (77)	1.35% (3)
	More than one hour	58.82% (20)	32.35% (11)	8.82% (3)

Exclusive breastfeeding and related issues: After delivery, the children life is very crucial and need extra care which would be beneficial for both the baby and its mother. From the study, of the total 257 respondents, 223 respondents (or 86.77%) fed breast milk within one hour of birth. About 34 respondents (or 13.23%) fed breast milk after one hour of the delivery time. Totally 208 respondents (or 89.93%) fed breast milk exclusively under 2 months of children. But 172 respondents (or 67%) fed exclusively under 4 months of children. Finally, 63.42% of respondents fed exclusively under 6 months of children.Several reasons worked behind exclusive child feeding. The study showed that about 20 respondents fed exclusive breast milk through the physician consultancy whereas 71 respondents fed breast milk by both personal experience and the physician consultancy. Only 4 respondents fed breast milk by the consultancy of mother or mother in law and 55 respondents fed exclusive feeding by personal experience.

For those who didn't feed their child exclusively, several reasons also exist here. About 76 respondents didn't exclusively feed due to insufficient breast milk. The mother understood insufficient breast milk when the baby was crying and remained hungry after feeding. Only 9 respondents didn't feed exclusively due to maintaining beauty whereas 9 respondents didn't feed because of performing their job. Of the total, only 2 respondents didn't feed for twin baby and one for physician's consultancy and only one case, the baby didn't feed breast milk. Those who didn't feed exclusively needed to feed other foods. Of the total, 94 respondents didn't feed exclusively breast milk. About 89 respondents fed formula milk, 3 respondents fed co milk, and 2 respondents fed food mur and suji.

IV. DISCUSSION

According to WHO and UNICEF, exclusive breastfeeding does not allow infants less than six months to have any supplementary drinks. Only oral rehydration solution, vitamins, and medicines prescribed by the doctor were allowed to feed along with breast milk.[1, 2] The breast milk is important for the health and well-being of a child under 6 months.According to BDHS, the rate of exclusive breastfeeding was 54.6% in 2011 and

55.29% in 2014[8,9]. The exclusive breastfeeding rate was 45% in South Asia and 37%globally. The present study found that the rate of exclusive breastfeeding was 63.42%. It was higher than the BDHS report but lower than the WHO and UNICEF recommended. In the study, the rate of exclusive breastfeeding was 67% under 4 months of children and 80.93% under 2 months of children. As a result, the rate of exclusive breastfeeding was falling as the age of the child increased day by day.

The descriptive analysis showed that the exclusive breastfeeding rate was 56.7% for the age group 17-25 years, 66.43% for 26-35 years, and 72.27% for 36-45 years which implied that the maternal age was positively related to exclusive breastfeeding. Most of the studies found the maternal age positively or negatively related to the exclusive breastfeeding[19,24].Along with others, the study also found that maternal education[14,16,19,20,24,27] had a strong relationship with exclusive breastfeeding. The employment status of maternal women was also negatively related to the exclusive breastfeeding[19,20,21].

The family income had a strong negative relationship with exclusive breastfeeding. Others found both positive and negative associations with exclusive breastfeeding[14,20]. The birth order, birth weight, the birthplace influenced the exclusive breastfeeding[10,17,18,19,20]. Mothers who delivered in a hospital had a higher chance of practicing exclusive breastfeeding compared to those who delivered at home[10]. Again the rate of exclusive breastfeeding was higher in those who had a normal delivery compared to cesarean section delivery[23]. Childbirth weight and childbirth order had also influenced on exclusive breastfeeding[17].

The gender of the baby is associated with the exclusive breastfeeding[20]. If the baby was male, parents provided extra feed. They had a biased outlook about the male baby. Those who were more careful visited the hospital during the delivery period and also exclusively fed breast milk to their children compared to those who were not delivered at the hospital. As the number of family member increases, the rate of exclusive breastfeeding also increases[20]. The study showed that the rate of exclusive breastfeeding was also related to household size. Our study found both the age gap and ante-natal care (ANC) influenced on the exclusive breastfeeding[26]. Post-natal care was influenced on exclusive breastfeeding under the study. The baby who became ill or whose parents were affluent more visited the hospital for post-natal care.

V. CONCLUSION

Exclusive breastfeeding is one of the most effective interventions to lessen infant morbidity and mortality. The rate of exclusive breastfeeding under 6 months of children is 63.42% in Dhaka city. The variation of the results occurred due to differences in the study time, place, and study sample. The family income, maternal employment status, ante-natal care, post-natal care, the age gap between two children, etc. were the main factors to influence the exclusive breastfeeding practices.

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Declarations

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