

Practices and Determinants of Exclusive Breastfeeding among Young Mothers Attending a Secondary Health Care Facility - A Cross Sectional Study

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The benefits of exclusive breastfeeding (EBF) cannot be over emphasized, especially in a country like India, where nearly 600,000 newborns die within 28 days of their birth every year while only 54.9% infants are exclusively breast fed. Lives of 820,000 children under-five, could be saved if all children aged 0-23 months were optimally breastfed. Present study tried to assess the prevalence of EBF among study subjects and its socio-demographic determinants, in rural South India. This was a cross-sectional study that employed a structured questionnaire to collect data from 182 mothers, attending a rural hospital in South India, from April 2019 to September 2019 selected through convenience sampling. The study reveals that less than half of the respondent mothers (48.3%) practiced exclusive breastfeeding. Four socio-demographic factors were found to be significantly associated with EBF practices and these were - age of mother ($p = 0.004753$), gender of the infant ($P < 0.000634$), number of antenatal visits ($p > 0.01148$) by respondents and caesarean Section delivery ($P < 0.027847$). In our study, EBF practices were found to be suboptimal giving rise to a need to educate every pregnant or lactating mother during their antenatal or post-natal visits by our health care workers about EBF and its benefits.

Keywords: Exclusive breastfeeding, Complementary food, Infant feeding, Determinants, Barriers

Introduction

Breastfeeding is one of the most effective ways to ensure child health and survival (WHO 2017a). Colostrum, the yellowish, sticky breast milk produced at the end of pregnancy, is recommended by the World Health Organization (WHO) as the perfect food for the newborn, and feeding should be initiated within the first hour after birth (WHO 2020a). Breastfeeding is potentially one of the top nutrition interventions for reducing under-five mortality. Over 820,000 children's lives could be saved every year, if all children 0-23 months were optimally breastfed. Improving child development and reducing health costs through breastfeeding results in economic gains for individual families as well as at the national level (WHO and UNICEF 2003). Further, increased breastfeeding is associated with US\$302 billion annually in additional income – nearly 0.5 per cent of world gross national income (WHO 2017b, c). World Health Assembly had set a target of increasing the rate of exclusive breastfeeding in the first 6 months up to

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at least 50 per cent compared to the prevalent rate of 40 per cent by 2025 globally (WHO 2020b).

While breastfeeding rates have improved globally, disparities in breastfeeding practices persist particularly in rural and low resource settings. In low and middle income countries (LMICs), only 37% of children are breastfed exclusively for the first 6 months of life (Victora et al. 2016). Situation in India is no better, as National Family Health Survey-2015-16 (NFHS-4), brings out that only 42.6% mothers initiated breastfeeding within one hour of birth, while only 54.9% children were exclusively breastfed (urban=52.1%, rural=56%). While majority of the states have registered improvement in EBF practices, the trends in Kerala and Karnataka have shown a decline i.e., from 56.2% to 53.3% and from 58.6% to 54.2% respectively (MHFW 2017, POSHAN 2017).

As India leads the world in the number of preterm births and neonatal mortality, understanding the factors associated with EBF can help in improving the nutritional status of millions of infants, and reducing neonatal mortality rate (UNICEF 2019a). Keeping in view the declining trends of EBF in Karnataka, present study was conceived and conducted among rural mothers attending a sub-district (SDH) Hospital located in Bantwal, Dakshina Kannada District, Karnataka, India, with an aim to determine prevalence of EBF and the socio-demographic variables which may have an association with it, as these findings may be useful later on, in planning and implementation of EBF intervention programs in the community.

Literature Review

Breastfeeding, also called nursing, is the process of feeding mother's breast milk to her infant, either directly from the breast or by expressing (pumping out) the milk from the breast and bottle-feeding it. Breast milk provides the infant with essential calories, vitamins, minerals, and other nutrients for optimal growth, health, and development. Breastfeeding is beneficial to both, the mother and her infant, and also offers an important opportunity for the pair to bond (NIH 2017).

WHO, as well as UNICEF recommend initiation of breastfeeding within the first hour after the birth; exclusive breastfeeding for the first six months; and continued breastfeeding for two years or more, together with safe, nutritionally adequate, age appropriate, responsive complementary feeding starting in the sixth month. Similar recommendations have also been made by American Academy of Paediatrics on breastfeeding (UNICEF 2015, NIH 2017).

Studies reveal that newborns that started breastfeeding between two and 23 hours after birth had a 33% greater risk of dying as compared to those who began breastfeeding within one hour of birth. Among newborns that started breastfeeding a day or more after birth, the risk was more than twice as high. Further, an exclusively breastfed child is 14 times less likely to die in the first six months of life than a non-breastfed child, as breastfeeding drastically reduces deaths from acute respiratory infection and diarrhea, the two major child killers (WHO 2018). Sadly, only 44% of new-born are put to the breast within the first hour of birth

globally and only 2 in 5 infants less than 6 months of age are exclusively breastfed (UNICEF 2019b). WHO (2012) recommends that a new mother should have at least 16 weeks of absence from work after delivery, to be able to rest and breastfeed her child (WHO 2012).

Studies also bring out that exclusive breastfeeding helps children support healthy brain development, improves cognitive performance and is associated with better educational achievement at the age of five years (UNICEF 2015). Research further indicates that, breastfeeding supports infants' immune system and may also protect them later in life from chronic conditions such as obesity and diabetes (WikiLectures 2014). Besides, breastfeeding also benefits the mothers in many ways - it lowers their risks of breast and ovarian cancer, helps them return to their pre-pregnancy weight faster, reduces the rates of obesity and lowers the incidence of postpartum depression (WHO 2013, Hamdan and Tamim 2012).

Questions have been asked as to why not to use infant formula? The answer is that infant formula does not contain the antibodies found in breast milk and is also linked to some inherent risks, such as water-borne diseases that arise from mixing powdered formula with water which may not be safe sometimes, over-diluting formula to "stretch" supplies and the cost of formula may not be affordable to many poor families. Infants who receive formula feedings are also at a higher risk for acute otitis media, asthma, diabetes, eczema, lower respiratory tract and infections. Besides, formula is harder to digest for a new born baby and stays in the stomach longer than breast milk, which may cause the baby to feed less often and cause a decrease in milk production of the mother (Dartmouth-Hitchcock 2020).

Studies in India and abroad bring out that EBF practices are sub-optimal in most of the developing countries while India is no exception. Research indicates that the main modifying variables to EBF practices are-the age of the mother, her educational status, economic status of the family, occupation/employment of the mother, parity, antenatal care, multiple births, cue to action/self-efficacy, type of delivery, birth weight of infant, previous experiences with breastfeeding, support from family and friends, support from health workers, knowledge of feeding babies, maternal prenatal intention, lack of awareness about benefits of EBF, personal motivation and perception of having insufficient milk secretion (Andy 2015).

Some of the studies undertaken in India and abroad on EBF and the various factors which influence it are given below:

Tarrant et al. (2010) conducted a prospective study on antenatal women who delivered healthy, term singleton infants, at 6 weeks and 6 months postpartum. Results brought out that breastfeeding initiation rates of the Irish-national and non-Irish-nationals were 47% and 79.6%, respectively, while the factors which were significantly associated with both breastfeeding initiation and 'any' breastfeeding at 6 weeks included age of the mothers (>35 years) and educational status. The negative perception that breastfeeding is an embarrassing way to feed an infant was demonstrated as a major barrier to initiation. The author recommended that health campaigns that focus on increasing the social acceptability of breastfeeding may prove effective in addressing this cultural barrier (Tarrant et al. 2010).

Bakoula et al. (2007) conducted a longitudinal study among 3734 Greek mothers to determine the prevalence and socio-demographic, psychosocial and environmental factors associated with maternal infants feeding intention. The results showed that any breastfeeding at 3 to 6 months were 52% and 24% respectively. The corresponding rates of exclusive breastfeeding were 37% and 17%. The author recommended health education programmes to support breastfeeding were necessary with special focus on non-working mothers and mothers who did not have previous breastfeeding experience (Bakoula et al. 2007).

Edmond et al. (2006) in his study among 10947 breastfed babies brought out that breastfeeding was initiated within the first day of birth in 71% of infants and by the end of day 3 in all but 1.3% of them, while 70% were exclusively breastfed during the neonatal period. Delay in the time of repair of episiotomy and labor duration less than 12 hours were associated with early breastfeeding initiation. Early contact between baby and mother, help received on the delivery table and the presence of more than one delivery assistant, positively influenced breastfeeding initiation (Edmond et al. 2006).

Behzadifar et al. (2018) in a systematic review and meta-analysis in Iran brought out an overall prevalence of EBF to be 53%. The OR for breastfeeding education received before pregnancy was 1.13, for mother's job -1.01, for education level -1.12, for type of delivery -1.16 and for gender of child -1.03 (Behzadifar et al. 2018).

Oakley et al. (2013) in their study in England (2010-2011), which included all the 151 primary care trusts (PCTs) in England, observed considerable variations in breastfeeding with breastfeeding initiation mean -72%, any breastfeeding at 6-8 weeks mean -45%, and exclusive breastfeeding at 6-8 weeks mean -32%. Maternal age was strongly associated with breastfeeding. Weaker associations were observed between socio-demographic factors and breastfeeding in London PCTs (Oakley et al. 2013).

Raveendran et al. (2020) in their study in Kerala (India) brought out rather low prevalence of EBF i.e., 21.9%, with a median duration of four months. Main factors which influenced the EBF were observed to be maternal education, occupation of mother and advice on exclusive breastfeeding during antenatal visits. Perception of inadequacy of breast milk was found to be the major barrier to non-exclusive breastfeeding (Raveendran et al. 2020).

According to Hayden et al. (2009) health behavior is determined by personal beliefs and perceptions which are based on four constructs -perceived susceptibility, perceived severity or seriousness, perceived barriers and perceived benefits. The individual perception together with cues to action and self-efficacy determine the health behavior or action. Studies bring out that the success of a breastfeeding promotion program will depend on understanding the major constructs which are modified by variables such as culture, educational level, past experiences, skill, socio-demographic variables and motivation (Hayden et al. 2009).

The review of literature thus brings out a huge scope for improvement of EBF practices globally as well as in our country, and also the need to understand

various socio-demographic characteristic like age, education, parity, economic status, and employment which may influence the these practices.

Methodology

Study Design: Present study was a cross-sectional descriptive study, conducted over a period of two months from 1 August 2019 to 30 September 2019; in a sub-district (SDH) Hospital located in Bantwal, Dakshina Kannada District, Karnataka, India. The reason for selecting the ibid hospital was that our Medical College has memorandum of understanding (MoU) for training and research of our undergraduate and post-graduate students.

Study Population: The study included all lactating mothers, attending the ibid hospital outdoor patient department (OPD) and had at least one living child aged less than two year and were willing to participate in the study. Convenience sampling method was adopted keeping in view the time frame and the available resources. Finally a total of 182 mothers were enrolled in the study.

The Study Instrument and Data collection: A structured questionnaire was then administered to the study respondents through face to face interviews after taking written informed consent from the participants. Approval of Institutional Ethical Committee (IEC) was obtained before the conduct of study. The participants were asked questions related to current breastfeeding practices and recall as to how early they initiated breastfeeding after the delivery including questions on complementary feeding, bottle feeding, any other foods or liquids given to the infant during first six months. The questionnaire also collected information on socio-demographic characteristics of the mothers, type and place of delivery, and their knowledge about EBF.

Statistical Analysis: Data entry was done using Microsoft excel 2010 and analyzed using SPSS version 20.0. The descriptive parameters have been represented as frequencies and percentages. The chi-square test has been used for assessing the significance of breastfeeding practices and selected variables. The p-value less than 0.05 have been taken as significant.

Operational Definitions

Breastfeeding practices were assessed based on the World Health Organization (2008) definitions for assessing infant and young child feeding practices (WHO 2008).

Exclusive breastfeeding: Exclusive breastfeeding" is defined as no other food or drink, not even water, except breast milk (including milk expressed or from a wet nurse) for 6 months of life, but allows the infant to receive ORS, drops and syrups (vitamins, minerals and medicines).

Early initiation of breastfeeding: Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

Exclusive Breastfeeding under 6 months: the proportion of infants 0-5 months of age who were exclusively breastfed in the last 24 h.

Continuous breastfeeding at 1 year: Proportion of children 12-15 months of age who are fed breast milk in the last 24 h.

Timely complementary feeding: Proportion of infants 6-8 months of age who were breastfeeding and receiving solid, semi-solid or soft foods.

Bottle feeding: The proportion of infants less than 24 months of age who were receiving any liquid (including breast milk) or semi-solid food from a bottle with nipple/teat including non-human milk and formula in the last 24 hours.

Results

Socio-Demographic Characteristics

Present study, included a total of 182 participants. The majority of the mothers, 146 (77.0%) belonged to 21-30 years age group, 13 (7.1%) mothers belonged to less than 20 years age group while remaining 23 (12.6%) were aged more than 30 years. The mean age of the mothers was 23.6 years. Among the respondents, 143 (78.5%) mothers were Hindus while remaining 39 (21.4%) belonged to other religions. Furthermore, 11 (6.0%) of the mothers were illiterate, 117 (64.2%) belonged to social class II/III, 153 (84.0%) were housewives, 97 (53.2%) stayed in joint families, 96 (52.7%) had male children, while 128 (70.3%) mothers had two or more children (Table 1).

Awareness on EBF and its Advantages

Table 2 brings out awareness among mothers about EBF and its advantages. It was observed that 166 (91.2%) of the respondents had heard of EBF, but only 98 (53.8%) actually knew that it meant feeding only breast milk for six months. Furthermore, only 44 (24.1%) mothers rightly brought out that initiation of breastfeeding should be within the first hour of delivery. Most of the mothers 126 (69.2%) felt that complementary feeding should be started around 6 months of age for the babies. The study brought out that 33 (18.1%) mothers were aware that breast milk protects the baby from many diseases, 21 (11.5%) were aware that breastfeeding creates a bond between mother and baby while 89 (48.9%) felt that breast milk is best food for babies. Furthermore, 63.7% mothers also felt that they may not be producing sufficient milk to meet the nutritional needs of the babies.

Table 1. Socio-Demographic Characters of Study Population (n=182)

Variables	Frequency	Percentage
Age in years		
<20	13	7.1
21-24	77	42.3
25-30	69	37.9
>30	23	12.6
Literacy status of mother		
Illiterate	11	6.0
Primary	51	28.0
Secondary	73	40.1
Above Secondary	47	25.8
Occupation		
House wife	153	84.0
Employed	29	15.9
Socio-economic status		
I	17	9.3
II	39	21.4
III	76	41.7
IV	41	22.5
V	09	4.9
Type of family		
Nuclear	85	46.7
Joint	97	53.2
Poverty line		
APL	23	12.6
BPL	159	87.3
Religion		
Hindu	143	78.5
Muslim/Others	39	21.4
Gender of infant under survey		
Male	96	52.7
Female	86	47.2
Number of children in the family		
Single	54	29.6
Two	79	43.4
> Two	49	26.9

Table 2. Awareness on Exclusive Breastfeeding and its Benefits of (n=182)

Statement	Frequency	Percentage
Ever heard of exclusive breastfeeding	166	91.2
EBF means only breastfeeding for 6 months	98	53.8
Breastfeeding should start after delivery		
Within one hour	44	24.1
Within 24 hours	85	46.7
After 24 hours	47	25.8
Do not know	06	3.2
What is the period for exclusive breastfeeding		
1- 2 months	24	13.1
3-4 months	17	9.3
5-6 months	35	19.2
6 months	98	53.8
Do not know	08	4.3
Age at which baby should be given liquid/solid foods		
1- 2 months	19	10.4
3-4 months	21	11.5
5-6 months	126	69.2
Do not know	16	8.7
Do you know it protects your baby from many dangerous diseases	33	18.1
Breastfeeding creates a bond between mother and baby	21	11.5
Breast milk is best food for babies?	89	48.9
Do you think only your milk is sufficient for the baby for first 6 months		
Yes	66	36.2
No	116	63.7

Breastfeeding Practices among Mothers

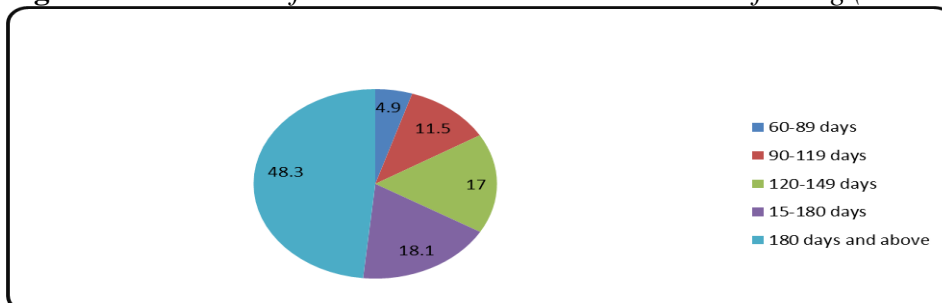
Table 3 brings out breastfeeding practices among the respondents. The study brings out that 168 (92.3%) mothers were breastfeeding their babies at the time of interview. It was further observed that, 136 (74.7%) mothers started breastfeeding within the first hour after delivery while 38 (20.8 %) started between 1 h and 24 hours. Majority 161 (88.4%) of the new born babies were given colostrum while 56 (30.7%) were given pre-lacteal feed. Further, 138 (75.8%) mothers practiced breastfeeding on regular basis. Continuous breastfeeding rate at 1 year was found to be 77.3% while 57.1% babies were using a feeding bottle. However, timely complementary feeding was provided to only 35.1% infants.

Table 3. Breastfeeding Practices among Mothers (182)

Feeding Practices	Frequency	Percentage
Currently breastfeeding	168	92.3
Initiation of breastfeeding		
Within one hour	136	74.7
> one h - 24 h	38	20.8
> 24 h	8	4.3
Colostrum given to baby	161	88.4
Timely complementary feeding	64	35.1
Continuous breastfeeding at 1 year	144	79.1
Bottle feeding	104	57.1
Pre-lacteal feed	56	30.7
Frequency of Breastfeeding		
Regularly	138	75.8
On demand	35	19.2
Randomly	9	4.9

Exclusive Breastfeeding

Present study brings out that 88 (48.3%) mothers practiced EBF while 94 (51.6%) mothers did not. The study further brings out that 4.9% mothers breast fed their babies for duration of less than 90 days, 11.5% breast fed for 90 to 119 days, 17.0% breast fed for 120 to 149 days while 18.1% mothers breast fed their babies for 150 to 179 days (Figure 1).

Figure 1. Prevalence of Exclusive and Non-Exclusive Breastfeeding (n=182)

Determinants of Exclusive Breastfeeding

The present study brings out higher prevalence (58.6%) of EBF among mothers from higher age group (25 years and above), while mothers in the younger age group (24 years and below) were having lower prevalence (37.7%). Further, the EBF practices were found to be high (60.8%) among the families which were below poverty line, as compared to those who were above poverty line (46.5%). In our study, practice of EBF was found to be almost equal among nuclear as well as joint families i.e., 48.2% and 48.4% respectively. Further, the EBF practices were found to be 54.5% among illiterate mothers while it was 47.9% among literate mothers. The practice of EBF was found to be relatively

much higher (54.9%) among mothers who were house wives/ not working, while only 13.7% of working mothers practiced EBF.

Among Hindus, 45.4% and among Muslims, 58.9% mothers exclusively breast fed their babies. Among 96 male children, 48.9% while among 86 female children, 47.6% were provided EBF. The study further brings out that, mothers with a single child practiced EBF in 57.4% cases as compared to 44.5% with more than one child. The study reveals 50.8% prevalence of EBF among mothers who had four or more antenatal visits as compared to 44.2% among those who had three or less visits. Further, EBF was found to be 30.55% among mothers who had caesarean section as compared to 52.7% among those who had normal vaginal delivery.

We tried to establish an association between selected socio-demographic variables and the practice of EBF and found some of these to be significantly associated and these were-maternal age ($p < 0.004753$) occupation of the mother ($p < 0.000049$), gender of the infant ($p < 0.000634$), number of antenatal visits ($p < 0.01148$) and type of delivery, i.e. vaginal or caesarean ($p < 0.027847$) (Table 4).

Table 4. Determinants of Exclusive Breastfeeding n=182

Variable	EBF(n=88) (%)	NEBF(n=94) (%)	Total(n=182) (%)	χ^2 / p value
Maternal age in years				
< 25	34 (37.7)	56 (62.2)	90	7.9712
>25	54 (58.6)	38 (41.3)	92	$p < 0.004753$
Literacy status of mother				
Illiterate	06 (54.5)	05(45.4)	11	0.0127
Literate	82 (47.9)	89(52.0)	171	$p > 0.91014$
Occupation of mother				
House wife	84 (54.9)	69 (45.0)	153	16.4967
Employed	04 (13.7)	25 (86.2)	29	$P < 0.000049$
Socio-economic status				
BPL	14 (60.8)	09 (39.1)	23	1.652
APL	74 (46.5)	85(53.4)	159	$p > 0.198693$
Type of family				
Nuclear	41 (48.2)	44 (51.7)	85	0.5574
Joint	47 (48.5)	50 (51.5)	97	$p > 0.453313$
Gender of infant under survey				
Male	67(69.7)	29 (30.2)	96	11.6726
Female	21(24.4)	65 (75.5)	86	$P < 0.000634$
Number of children in the family				
One	31 (57.4)	23(42.5)	54	2.5214
>One	57 (44.5)	71 (55.4)	128	$p > 0.112313$
Antenatal visits				
< four	21 (35.0)	39 (65.0)	60	6.3895
> four or more	67(54.9)	55 (45.0)	122	$p > 0.01148$
Type of delivery				
Vaginal	77 (52.7)	69 (47.2)	146	4.8375
Caesarean	11 (30.5)	25 (69.4)	36	$P < 0.027847$

Discussion

Present study brings out that 92.3% mothers were breastfeeding their babies at the time of interview, 74.7% mothers had initiated early breastfeeding, 88.4% infants were given colostrum, 30.7% were given pre-lacteal feed, 35.1% infants were given timely complementary feed and 57.1% babies were using a feeding bottle. In a similar study in a neighboring district in Karnataka, by Manjunatha Swamy et al. (2015), it was observed that only 17.17% of mothers intended to exclusively breastfeed their infants for six months while majority of mothers (36.13%) wanted to continue EBF only for four months. Their study also found that 34.13% mothers had initiated early breastfeeding while majority (75.25%) of the mothers had provided colostrum to their new born babies Manjunatha Swamy et al. (2015). In another study by Bernard Yeboah in Ghana, 74% of the mothers were found to be breastfeeding their children, more than half of all mothers (63.4%) had started early breastfeeding, about 81% of all mothers had offered colostrum to babies, EBF rate under 6 months was found to be 66%, continuous breastfeeding rate at 1 year was observed to be 77.3%, 43.5% of the infants aged 6-8 months were introduced to complementary feeding and among children less than 24 months, less than half (30.1%) were being bottle fed. These findings are similar to our findings (Yeboah-Asiamah Asare 2018).

In our study, less than half of the mothers (48.3%) practiced exclusive breastfeeding, which is lower than the national average of 54.9% as well as Karnataka average of 54.2%. Further, the mean duration of EBF among our respondent mothers was 107 days. The study brings out that 51.6% of the mothers did not complete EBF for 180 days. The study further brought out that 4.9%, mothers breast fed their babies for duration of less than 90 days, 11.5% mothers breast fed for 90 to 119 days, 17.0% mothers breast fed for 120 to 149 days while 18.1% mothers breast fed their babies for 150 to 179 days. In a similar study by Vijayalakshmi et al. (2015) 88.5% of the mothers were breastfeeders, but only 27% of the mothers were exclusive breastfeeders and only 36.9% initiated breastfeeding within an hour (Vijayalakshmi et al. 2015). In another study by Oche and Umar (2008) from in Sokoto, Nigeria, high prevalence of Exclusive breastfeeding was reported, as 78.7% of the mothers gave only breast milk up to six months after delivery, 71% of them continued breastfeeding for 19-24 months while majority of the mothers (76%) continued breastfeeding even when they felt their child was old enough to be weaned (Oche and Umar 2008).

We tried to identify major determinants of EBF in our study subjects. In our study prevalence of EBF was found to be relatively lower i.e., 37.7% among younger mothers (<25 years) as compared to 58.6% among the older mothers (>25 years) and this difference was also found to be statistically significant ($p < 0.004753$). Nishimura et al. (2018) in their study from south India also reported increased EBF rates, with increase in maternal age (OR=1.04) (Nishimura et al. 2018). In a similar study, by Zielinska and Hamulka (2018) in Poland, the researchers also brought out that the highest risk factors for N-EBF were maternal age <20 years (Zielinska and Hamulka 2018).

Present study brings out that EBF practices were found to be slightly higher (54.5%) among illiterate mothers as compared to literate mothers (47.9%). Similar findings, have also been reported by Akpojene Ogbo et al. (2019) in their studies and brought out that mothers with higher level of education were less likely to exclusively breastfeed their infants (Akpojene Ogbo et al. 2019). However, contrary to our findings, Naik et al. (2019) in their study from Srinagar, India reported significantly higher rates of EBF among babies born to parents with higher education Naik et al. (2019).

In our study prevalence of EBF was found to be higher among housewives (54.9%) as compared to working mothers (13.7%) and this was found to be statistically highly significant. In a similar study, Al-Kohji et al. (2012) in Qatar also reported that EBF rates were higher among housewives in comparison with employed mothers, as the unemployed mothers (Al-Kohji et al. 2012). However, contrary to our findings, Basu et al. (2018) reported higher prevalence of EBF among working mothers (50.0%) as compared to housewives (33.3%) (Basu et al. 2018).

In our study EBF rate was found to be 60.8% among the families which were below poverty line (BPL), as compared to 46.5% among those, who were above poverty line (APL). However, this difference was not found to be statistically significant, ($p > 0.198693$). In a similar study by Mawa et al. (2019) in Uganda, it was observed that odds ratios for exclusive breastfeeding by household wealth index were 2.38 (1.30-4.33), for the poorest, 2.16 (1.18-3.96) poorer, 1.91 (1.10-3.48) middle, and 1.41 (0.75-2.64), for richer households (Mawa et al. 2019).

In our study, practice of EBF was found to be almost same among nuclear as well as joint families i.e., 48.2 % and 48.4% respectively. However, contrary to our findings Gupta et al. (2006) in a study in urban slums of Rishikesh, (Uttar Pradesh) reported higher prevalence of EBF among mothers from Joint families (31.6%) as compared to mothers from nuclear families (24.7%); though this difference was not found to be significant (Gupta et al. 2006).

Gender of infant has been reported to an important determinant of EBF in India. In our study too, 69.7% male children were given EBF as compared to 24.4% female children and this difference was also found to be statistically significant ($p < 0.000634$). However, Habtewold et al. (2019) in a meta-analysis and Vanderlinden and Van de Putte (2017) in their study in Belgium did not report any significant association between gender of infant and EBF practices (Habtewold et al. 2019, Vanderlinden and Van de Putte (2017)).

Present study brought out that, mothers with a single child practiced EBF in 57.4% cases as compared to 44.5% with more than one child. Perera et al. (2012) in their study in Sri Lanka brought out that second born babies had a higher exclusive breastfeeding rate (73.6%) compared to first born (70%) while the EBF rate dropped again after the second baby to 66.6% (Perera et al. 2012).

Higher numbers of antenatal visits have been found to be associated with the highest odds of EBF. The benefits of breastfeeding should be emphasized during the initial antenatal visit to increase EBF rates among all mothers, though the studies on the association between EBF and number of antenatal visits in India and other countries are not consistent. Present study reveals 50.8% prevalence of EBF

among mothers who had four or more antenatal visits as compared to 44.2% among those who had three or less visits and this difference was also found to be statistically significant ($p > 0.01148$). Bhanderi et al. (2019) in their study in Gujarat, also brought out similar findings and observed higher prevalence (52.7%) of EBF among those who had >4 antenatal visits as compared to those who had <4 antenatal visits (33.3%) (Bhanderi et al. 2019).

In majority of studies Caesarean section has been reported to be an important barrier to EBF. In our study too, this trend was observed as EBF was found to be only 30.55% among mothers who had caesarean section as against 52.7% among those who had normal vaginal delivery and this difference was also found to be statistically significant ($P < 0.027847$). In a similar, but prospective cohort study from China, Chen et al. (2018) brought out exclusive breastfeeding rates at 1, 3, and 6 months as 80.2%, 67.4%, and 21.5%, respectively and also observed lower rates of EBF among women who had a cesarean delivery than those who had a vaginal delivery ($p < 0.05$). The authors further observed that Cesarean delivery also shortened the breastfeeding duration (hazard ratio = 1.40, 95% confidence interval) (Chen et al. 2018).

Conclusions

In our study, EBF practices were found to be suboptimal and below the national as well as Karnataka state average, while these were influenced by multiple socio-demographic variables. The benefits inherent in the practice of EBF cannot be over emphasized, especially in a country like India, where a quarter of global neonatal deaths happen, i.e., nearly 600,000 newborns die within 28 days of their birth every year. Needless to say, that this study brings out an urgent need for health awareness interventions with special focus on the benefits of EBF for both, the infant and the mother. The health education drives should specifically target the new mothers and their family members as the studies indicate a strong influence of mother's parents and her in-laws on breastfeeding practices.

Limitations

The present study had the limitations which are inherent in all cross sectional studies as these make articulation of temporal association between the study factors and EBF difficult. Further, this was a hospital based study hence data obtained cannot be considered to be the true representative of general population. As the method of data collection in present study was face to face interview, recall bias due to lapse of time and information bias due to personal reasons may not be ruled out.

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