

Determinants of Breast Milk Substitute Use for Mothers with Infants Less Than Six Months in Jigjiga City, Somali Region, Eastern Ethiopia: A Case-Control Study

Abdulahi Haji Abas^{*}, Ahmed Tahir Ahmed, Abdifatah Elmi Farah, Hashim Sheik

Department of Public Health, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia

Email address:

cabasaw@gmail.com (A. H. Abas)

^{*}Corresponding author

To cite this article:

Abdulahi Haji Abas, Ahmed Tahir Ahmed, Abdifatah Elmi Farah, Hashim Sheik. Determinants of Breast Milk Substitute Use for Mothers with Infants Less Than Six Months in Jigjiga City, Somali Region, Eastern Ethiopia: A Case-Control Study. *International Journal of Nutrition and Food Sciences*. Vol. 11, No. 2, 2022, pp. 12-19. doi: 10.11648/j.ijnfs.20221102.11

Received: February 7, 2022; **Accepted:** March 7, 2022; **Published:** March 23, 2022

Abstract: *Background.* Breast milk substitute (BMS) is any food being marketed or otherwise presented as a partial or total replacement for breast milk, whether or not suitable for that purpose. Determinant use of breastmilk substitutes for infant feeding despite the WHO recommendation have been the subject of various research studies. However, there are limited data in the developing countries, particularly in the study area. The purpose of this study was to assess determinant the use of BMS for mothers with infants less than six months in Jigjiga city. *Methods.* Quantitative Community based matched case-control was conducted from 24th of June, 2019 to 6th of August, 2019, using interviewer administered questionnaire. This study included 160 mothers with infants less than six months. Data were cleaned and exported to SPSS version 20 and both descriptive and analytical analyses were executed. The level of significance was set at $P < 0.05$. Binary logistic regression was used to produce summary of statistics including crude and adjusted odds ratio and 95% confidence intervals. *Result.* the study identified six main variables as influencers for use of BMS among mothers with infants less than six months, after multivariate logistic regression analysis, lack of breastfeeding counselling during antenatal and postnatal care visits, infants older than three months, unhealthy infants at birth and exposure of BMS before delivery were independent associated with use BMS. *Conclusion.* Commercial promotion of breastmilk substitute through local Medias is very common in study area, as result of this, confidence of mother to exclusively breast feed infants is significantly affected. These alarms more work on strengthening counselling, particularly, age specific counselling on exclusive breastfeeding at health facilities and through local Medias, to counteract promotion of breastmilk substitutes from others TVs in Somalia and female merchants.

Keywords: Determinant, Breast Milk Substitute Use, Mothers, Infants, Somali Region

1. Introduction

Breast milk substitute (BMS) is any food being marketed or used as a partial or total replacement for breast milk, whether or not suitable for that purpose [1]. Although production of a same product to breast milk is not feasible, every effort has been taken to mimic the nutrition profile of human breast milk for normal infant growth and development [2]. BMS manufacturers spend millions of dollars annually to promote their products. These efforts are highly successful, and the sales of BMS are projected to increase from US\$45 billion in 2014 to US\$71 billion in 2027 [3].

In 2011 the WHO estimated that 65% of infants between the 0 to 4 months had been introduced to BMS globally [4]. Although across the regions of the world, there is a wide variation and difference in rates of use of BMS [5]. According to UNICEF report, the regions with the highest use of BMS are West/Central Africa (80%) and Central and Eastern Europe/Commonwealth of Independent States (CEE/CIS) (78%) while lowest rate of breastmilk substitute are reported from the East Asia/Pacific (57%) and Eastern/Southern Africa (59%) regions. However, the exclusive breastfeeding rates in West/Central Africa even though still high have seen significant decline in use of BMS,

while use of BMS increased in Eastern Africa [6]. In the developing world, about 3 out of every 5 children or approximately 60% of infants are introduced to BMS before they are 6 months old. Despite these high percentages however, the trends of use of BMS have declined over the years in developing countries; from 66% in 1990 to 60% in 2012. Since 1990 the African countries that have made major steps in reducing the use of BMS are Ghana, Mali, Nigeria, Burkina Faso, Madagascar Senegal, Cameroon, the United Republic of Tanzania, Zambia and Zimbabwe [6].

The attractiveness of BMS is of concern in developing countries, as these products become increasingly available. Mothers feeding their children are attracted by the new products on display continuously, they may not be able to tell the difference between appropriate and inappropriate products because high exposure of marketing. This is an old but well known problem that has not been resolved yet, the advertising and use of BMS has a strong negative impact on child survival [6].

It has long been known that marketing and market exposure may subtly bias choices by shaping perceived social norms concerning alternatives to breastfeeding, and creating a distorted view of what is the most 'scientific' or optimal food for infants. Research conducted recently on neuro-economics highlights how market advisement might take advantage of normal neurological processes to increase the likelihood of consumer 'mistakes', manipulating choice contexts to increase time pressures or stress, and influencing how much emphasis is given to various product attributes in consumer decision-making [7].

Exclusive breastfeeding is a cornerstone of child survival and child health because it provides essential, irreplaceable nutrition for a child's growth and development. It serves as a child's first immunization, providing protection from respiratory infections, diarrheal disease, and other potentially life-threatening ailments. Exclusive breastfeeding also has a protective effect against obesity and certain non-communicable diseases later in life [4].

Globally, only 38% of infants aged 0 to 6 months are exclusively breastfed. Recent analyses suboptimal breastfeeding results in over 800 000 under-5 child deaths annually or 11.6% of the total, including 250 000 child deaths due to pneumonia and diarrhea [4]. Studies from Tanzania, Ghana, and India suggest that early initiation of breastfeeding reduces neonatal and early infant mortality both through increasing rates of exclusive breastfeeding and by additional mechanisms [8].

Research showed that babies who are breastfed exclusively for 6 months experience less illnesses because breast milk contains nutrients and substances that protect the baby from several infections, some chronic disease and it leads to improved cognitive development [7]. Gastroenteritis, or the family of digestive diseases whose primary symptom is diarrhea, occurs less often among exclusively breastfed children and is less severe when it does occur [9].

Determinants of BMS use for infant feeding despite the WHO recommendation have been the subject of various

research studies. Studies have reported linkage between various socio-demographic variables including educational level [10]. Marital status [11], Employment characteristics [12], and mother's use of BMS [13]. Furthermore, other studies have also reported that use of BMS or cessation of breastfeeding is influenced by maternal breastfeeding self-efficacy [10, 11], Antenatal visit during pregnancy and postnatal visits [12, 14-19], aggressive marketing of BMS like infant formula [20], the delivery characteristics of mother and her HIV/AIDS status [21], age of the infants [22-24], health of the infants at delivery [25]. Cereal porridges, family foods, infant formula and water are mainly reported to be used as BMS In the developing countries, while in the developed world the most used BMS is the infant formula [26].

The International Code of Marketing of Breast-milk Substitutes (BMS) was adopted by the World Health Assembly in 1981 in response to a rise in child mortality due to promotion of BMS. The International Code includes 14 articles and subsequent resolutions, which lay out responsibilities of governments, health care systems and workers, and BMS manufacturers with respect to providing objective and consistent information on infant and young child feeding, quality of manufactured BMS, and responsible labeling and marketing of these products [1].

Adoption of the Code is voluntary. As of 2014, 39 countries had fully implemented the Code in national legislation and 47 implemented some Code provisions only. Only 45 countries have functioning monitoring and enforcement systems in place according to the World Health Organization [3]. According to the WHO Code, 'marketing' of BMS includes "product promotion, distribution, selling, advertising, product public relations, and information services" [27]. Common marketing mediums include print, television, information help lines, online promotion, and point of sale advertising and free supplies. In the past decade, new communications technology has provided a range of alternative avenues for promotion and marketing [5].

Ethiopia is one of the signatory countries of the International Code of Marketing of Breast-milk Substitute in 1981. Although, Food, Medicine and Health Care Administration and Control Authority established food advertising directives in 2012, but international code of marketing of breast milk substitute was endorsed recently in 2016 [28], still violation of this code of marketing breastmilk substitutes continues in the country particularly in the study area.

Breastfeeding is being endangered by this increased marketing of formula and non-formula milk, for many years, it has been recognized that in unhygienic conditions and low nutrition values of breast-milk substitutes carry a higher risk of infection and nutritional deficiency than breastfeeding and can be fatal for infants contributing high rates of malnutrition and infant and child mortality. The situation is worst in the study area where breastmilk substitutes are widely advertised and marketed through local Medias and female merchants, this advertisement is very attractive and highly convincing mothers to start BMS than continuing exclusive breastfeeding for infants.

Advertisements of these breast milk substitutes are also seen in the markets and public places, as result of this, mothers are using BMS for infants less than six months as per reports from government offices responsible for promotion of optimal infant and young child feeding. The purpose of this study was to assess determinant of BMS use for mothers with infants less than six months in Jigjiga city. The finding of this study will be used for evidence based strategy development for Infant breastfeeding promotion.

2. Methods

2.1. Study Design and Area

Community based matched case control study design was used to assess determinant use of breastmilk substitutes. The study was conducted from 24th June to 6th August, 2019 in Jigjiga City. Jigjiga city is the administrative city of the Somali regional state located at a distance of 636 km away from Addis-Ababa, eastern part of Ethiopia. There are 20 kebeles/neighborhoods in the city, the city is also an administrative city of Fafan zone of the Somali region. In the Fafan Zone, the health service coverage is estimated to be 70%. The health facilities found in the Jigjiga city are 1 regional hospital, 1 Referral hospital, 1 private hospital, 3 functional health centers, and 30 private clinics [29].

2.2. Study Subjects, Sample Size and Sampling Procedure

All mothers with infants less than six months in the selected wards or neighborhoods in Jigjiga city were considered as study subject. Mothers with infants less than six months giving BMS for their infants were selected as cases, while mothers with infants less than six months exclusively breastfeeding were considered as controls. Controls were matched to cases on age (infants less than six) and parity (mothers with 2 to 4 children) which are considered to be potential confounders.

A total of 160 mothers (80 cases and 80 controls) were studied. The sample size was determined using Statcalc command of Epi info 7 statistical software package by considering exposure to promotion of BMS as significant influencer of use of BMS for infants less than six months, thus, frequency of exposure in control group of 32.1% was used, level of significance (α)=0.05, the power of the test ($1-\beta$) = 80%, and the case to control ratio(r) of 1 and Odds ratio of 2.5.

2.3. Data Collection Procedures and Quality Assurance

Both cases and controls were selected from the community and multistage sampling method was used, by considering jigjiga city, which consist of 20 awards or neighborhoods, four neighborhoods were selected from these 20 neighborhoods by simple random sampling, then the calculated sample size for both cases (80) and controls (80) are proportionally allocated according to infant population load of each neighborhoods. A trained interviewer administered structured questionnaires to examine determinant mothers to use BMS available in Jigjiga city for

quantitative studies using kobo toolbox data collection tool, 7 Health public health professionals were recruited to participate in data collection.

The structured questionnaire instrument was designed to collect information on the mother's socio-demographic, maternal factors, health service delivery, marketing exposure, child factors on use of breast milk substitutes. Prior to data collection, the PI trained the data collectors and the supervisor for three days to familiarize them with the proper completion of the questionnaire and how to ask questions and record the response in order to ensure standardization and avoid interviewer bias. The questionnaires were pre-tested a week before the actual data collection days and modification was done accordingly. To keep completeness and consistency, data collectors were closely supervised before and during the data collection process by the supervisor and principle investigator.

2.4. Data Management and Analysis

After the data cleaned by checking for error, implausible values and inconsistencies that might be due to data entry errors during uploading in toolbox, the data was transferred to SPSS version 20 software packages for analysis.

Frequency distributions were also generated to identify outliers before subjecting the data to analysis using SPSS Version 20. Descriptive statistics (frequency and percentage) were calculated. Cross tabulation and chi-square testing was used to determine the existence of a significant association between socio-demographic and other determinants with use of BMS. Odds ratio with a 95% confidence interval was calculated to measure the strength of association between dependent and independent variables.

To ascertain the association; variables with $P \leq 0.2$ in the bivariate analysis was used to construct a multivariable model. Finally, Logistic regression analysis was done to control possible confounders and to determine factors that may be significantly associated with use of BMS. For multivariable analysis, statistical significance was considered with two sides P-value of less than 0.05 and Independent associations between variables were characterized by adjusted odds ratios and 95% confidence intervals.

2.5. Ethical Considerations

Letter of ethical approval was obtained before the beginning of data collection from Jigjiga University. Permission letter was provided to Jigjiga City Administration health office. After that, orientation about the purpose and procedure of data collection was given to participants and that confidentiality and privacy was ensured after consent form filled.

2.6. Collaborating Institution

Somali regional health bureau and Jigjiga City Administration health office were the institution collaborated as these institutions oversee all health related matters in the region and Jigjiga respectively. These institutions will be eventually own and implement the study findings and recommendations.

3. Results

3.1. Socio-demographic Characteristics of the Participants

Out of 172 respondents expected, 168 gave responses (98% response rate) Among those interviewed, 168 respondents (cases) started breastmilk substitutes to their infants less than six months and 80 respondents (control) exclusively breastfed their infants less than six months. The mean age of cases was found to be 25.5 (SD = ± 4.5) and 24.4 (SD = ± 3.8)

for controls. In both study groups, more than 97% of women were married and more than 88% were Muslim among the cases. Regarding educational status, 46.2% of mothers found in the cases and 37.5% of mothers in the control group had no formal education, Majority of the study participants in the control group, 86.2% and 72.5% in the case group were housewives. Thirty-eight percent of the cases had the lowest wealth indexes (table 1).

Table 1. Sociodemographic characteristics of mothers with infants less than six months in Jigjiga City, Somali region, Eastern Ethiopia, June to August, 2019.

characteristics	Category	Cases number (%)	Controls number (%)
Age of mother	15-19	7 (8.8)	10 (12.2)
	20-34	67 (83.8)	69 (86.2)
	>34	6 (7.5)	1 (1.2)
Marital status	Married	78 (97.5)	79 (98.8)
	Divorced	0 (0.0)	0 (0.0)
	widowed	2 (2.5)	1 (1.2)
ethnicity	Somali	67 (83.8)	45 (56.2)
	Oromo	2 (2.5)	3 (3.8)
	Amhara	11 (13.8)	32 (40.0)
Religion	Muslim	71 (88.8)	52 (65.0)
	Christian	9 (11.2)	28 (35.0)
Education	No formal education	37 (46.2)	30 (37.5)
	Grade 1-4	2 (2.5)	7 (8.8)
	Grade 5-8	15 (18.8)	18 (22.5)
	Grade 9-12	10 (12.5)	20 (25.0)
	College and above	16 (20.0)	5 (6.2)
Occupation	Daily labor	5 (6.2)	5 (6.2)
	Government employee	11 (13.8)	4 (5.0)
	Merchant	6 (7.5)	2 (2.5)
	House wife	58 (72.5)	69 (86.2)
	Lowest	31 (38.8)	41 (51.2)
Wealth index	Middle	14 (17.5)	24 (30.0)
	Highest	35 (43.8)	15 (18.8)

3.2. Maternal and Infants Characteristics and Exposure of BMS

Among study subjects, 97.5% of mothers from control group and 86.2% of mothers from case group delivered at health facility. Moreover, 73.8% of mothers in control group and 47.5% of cases received breastfeeding (BF) counselling during antenatal visits of their last pregnancy in the health facility; in contrast, 26.2% of cases and 40 % of controls received BF counselling immediately after delivery. 82.1% of cases and 96.2% of controls had normal vaginal delivery for their last pregnancy. Interestingly, more cases, 9.8% got back to work than controls, 5.0%, one month after delivery.

Majority of controls (82.2%) and cases (58.8%) were exposed on commercial advertisement of BMS before delivery of their last pregnancy, similarly, 51.2% of controls and 81.2% of cases were exposed on commercial advertisement after delivery of their last pregnancy, in addition, for both study groups, TVs broadcast from outside

Somali region were main source of information or exposure for this commercial advertisement. Regarding source of advice to use BMS, 57.1% of mothers from controls and 61.1% of mothers from cases received advice mostly from friends and neighbors.

Moreover, 53.8%, of infants from case group were females, while 57.5% infants from controls were males, 67.5% infants age from case group were between four and five months, whilst, 58.8% of infants from control group were between one and three months. Of both study groups, more than 86% of infants were not put into incubator for treatment after delivery. In addition to this, 93.8% of infants from controls and 70.0% from cases were health after delivery. Finally, Majority of controls (82.2%) and cases (58.8%) were exposed on commercial advertisement of BMS before delivery of their last pregnancy, similarly, 51.2% of controls and 81.2% of cases were also exposed on commercial advertisement after delivery of their last pregnancy (table 2).

Table 2. Characteristics for mothers with infants less than six months in Jigjiga City, Somali region, Eastern Ethiopia, Ethiopia, June to August, 2019.

Characteristics	Category	Cases number (%)	Control number (%)
Place of delivery	Health facility	69 (86.2)	78 (97.5)
	Home	11 (13.8)	2 (12.5)
Antenatal counselling on BF	No	42 (52.5)	21 (26.2)
	Yes	38 (47.5)	59 (73.8)
Postnatal counselling on BF	No	59 (73.8)	40 (50)
	Yes	21 (26.2)	40 (50)
Type of delivery	Vaginal	66 (82.1)	77 (96.2)
	Caesarian section	14 (17.5)	3 (3.8)
back to work after delivery	1-2 month	7 (9.8)	4 (5.0)
	3-4- months	3 (3.0)	0 (0.0)
	Not yet back to work	8 (10.0)	7 (8.8)
Gender of the child	Not applicable	62 (77.2)	69 (86.2)
	Female	43 (53.8)	34 (42.5)
Age of the child	Male	37 (46.2)	46 (57.5)
	1-3 months	26 (32.5)	33 (41.2)
infants health status at birth	4-5 months	54 (67.5)	47 (58.8)
	Health	56 (70.0)	75 (93.8)
Advertisement on foods (before delivery).	Sick	24 (30.0)	5 (6.2)
	Yes	69 (86.2)	47 (58.8)
Advertisement on foods (after delivery).	No	11 (13.8)	33 (41.2)
	Yes	68 (85.0)	51 (63.8)
	No	12 (15.0)	29 (36.2)

3.3. Determinant of BMS use for Infants Less Than Six Months

A final multivariate logistic regression model was fitted with 11 variables having a P-value ≤ 0.2 . Five variables. From this final model, it was found that, use of BMS was found to be significantly associated with the antenatal care (ANC) visits ($p = 0.002$), the odds of mothers who had no breastfeeding counselling during ANC visits were 3.5 times (AOR = 3.52; 95% CI: 1.58, 7.83) more likely to use BMS for an infant less than six months than mothers who had breastfeeding counselling during ANC visits in their last pregnancy. Similarly, breastfeeding counselling during postnatal care (PNC) visits were found to be significant protective for use of BMS, the odds of mothers with no

breastfeeding counselling during PNC visit were 2.8-fold (AOR=2.8; 95% CI: 1.28, 6.24) prone to use BMS than mothers who had breastfeeding counselling during their last PNC visit. In this study, exposure of BMS promotions before delivery is significantly associated with use BMS for mothers with infants less than six months (AOR=3.2; 95%CI: 1.3, 7.70).

Age of the infant was also found to be significant ($p=0.04$) predictor for use of BMS, odds of infants order than three months are 2.32 fold (AOR=2.32; 95% CI: 1.02, 5.27) more liable to receive BMS than younger infants. Moreover, infants who were un-health during delivery, as self-reported by mothers were higher odds (AOR=6.6; 95% CI: 2.11, 20.26) to receive breastmilk substitute than health infants during delivery.

Table 3. Final multi-variate logistic regression for determinant use of BMS for infants less than six months in Jigjiga City, Somali region, 2019.

Variable	Category	Use of BMS		Crude OR (95% CI)	Adjusted OR (95% CI)
		Cases n (%)	Control n (%)		
Place of delivery	Health facility	69 (86.2)	78 (97.5)	1	1
	Home	11 (13.8)	2 (12.5)	6.2 (1.3, 29)*	-
Antenatal counselling on BF	No	42 (52.2)	21 (26.2)	3.1 (1.59, 6.03)*	3.52 (1.58, 7.83)*
	Yes	38 (47.5)	59 (73.8)	1	1
Postnatal counselling on BF	No	59 (73.8)	40 (50)	2.8 (1.44, 5.45)*	2.83 (1.28, 6.24)*
	Yes	21 (26.2)	40 (50)	1	1
Type of delivery	caesarian section	66 (82.1)	77 (96.2)	5.4 (1.4, 1.97)*	-
	Vaginal	14 (17.5)	3 (3.8)	1	1
Age of the infants	1-3 months	26 (32.5)	33 (41.2)	1	1
	4-5 months	54 (67.5)	47 (58.8)	1.45 (0.80, 2.70)	2.32 (1.02, 5.27)*
Infant's health status at birth	Health	56 (70.0)	78 (97.5)	1	1
	Sick	24 (30.0)	2 (2.5)	6.4 (2.30, 17.89)*	6.61 (2.11, 20.26)*
Advertisement on foods (before delivery).	Yes	69 (86.2)	47 (58.8)	4.4 (2.02, 9.57)*	3.2 (1.3, 7.70)*
	No	11 (13.8)	33 (41.2)	1	1
Advertisement on foods (after delivery).	Yes	68 (85.0)	51 (63.8)	3.2 (1.5, 6.9)*	-
	No	12 (15.0)	29 (36.2)	1	1
Ethnicity	Somali	67 (83.8)	45 (56.2)	4.33 (1.9, 9.4)**	-
	Oromo	2 (2.5)	3 (3.8)	-	-
	Amhara	11 (13.8)	32 (40.0)	1	1

Variable	Category	Use of BMS		Crude OR (95% CI)	Adjusted OR (95% CI)
		Cases n (%)	Control n (%)		
Education	No formal education	37 (46.2)	30 (37.5)	-	-
	Grade 1-4	2 (2.5)	7 (8.8)	0.89 (0.014, 0.56)*	-
	Grade 5-8	15 (18.8)	18 (22.5)	0.26 (0.07, 0.87)*	-
	Grade 9-12	10 (12.5)	20 (25.0)	0.15 (0.44, 0.55)*	-
	College and above	16 (20.0)	5 (6.2)	1	1
Wealth index	Lowest	31 (38.8)	41 (51.2)	1	1
	Middle	14 (17.5)	24 (30.0)	-	-
	Highest	35 (43.8)	15 (18.8)	3 (1.4, 6.6)*	-

*Significant at p value of ≤ 0.05 ; OR in bold denotes being significant.

4. Discussion

The study identified six main variables as determinant of BMS use among cases and controls for mothers with infants less than six months; breastfeeding counselling during antenatal and postnatal visits, age of the infants, health status of infants at delivery and exposure of BMS promotions immediately after delivery.

In this study, lack of ANC visits were significantly associated with use of BMS for infants less than six months. This is line with study findings from Ethiopia and other countries [10, 15, 16, 18, 19, 30]. This could be due to the implementation of an urban health extension program which increases the number of mothers who receive ANC services including breastfeeding counseling that in turn improves breastfeeding knowledge of mothers. This could also be implementation of maternal infant and young child nutrition (MIYCN) at health facility as per National Nutrition Program in which health professionals are trained on nutrition counselling of pregnant and lactating mothers.

PNC visits are another maternal and child health service factor that has a significant association with the use of BMS. Those mothers who with no PNC visits were 6 times more likely to use BMS than those who had PNC visits, so, postnatal visit is protective for use BMS for infants less than six months. Our study is comparable with study findings from Ethiopia and other countries [15-17, 31, 32]. This might be the result of increased expansion of health facilities, and appointment of mothers to vaccinate their infants with multiple vaccines, as result, trained health professionals especially midwives provide counselling on infant feeding at these contact points since infant and young child nutrition is integrated in to other health services.

This study also revealed that child age was significantly associated with use BMS. Infants in age groups of 3-5 months were more likely to receive BMS than whose ages were less than 3 months. This finding was consistent with study findings from Ethiopia and other countries [22-24, 32, 33]. The reasons for this might be due to the fact that during this period there is a traditional postpartum (PNC) rest that allows mothers to work at home, which facilitates and creates favorable conditions for breastfeeding. The other possible explanation might be that mothers might have introduced complementary feeding for their infants less than six month old due to the assumption that breast milk alone would not

satisfy their needs as the infant gets older.

Moreover, infants who were un-health during delivery, as self-reported by mothers are more likely to be started for breastmilk substitute than health infants during delivery, health status of infants during delivery is significantly associated with the use breastmilk substitutes and this finding is supported by other findings [25, 34, 35]. Possible reason for this finding may be, if the baby is seriously ill or get birth with difficulties, attachment of the infants to breast is difficult, for this reason, so, BMS is given with bottle, as result of this, mothers may continue bottle feeding after the recovery even.

Likewise, this study found statistical significant associated between use of BMS and exposure of BMS promotions before delivery of the last pregnancy, particularly, through advertisement in the televisions thus, odds of mothers who were exposed to the commercial promotion of BMS before delivery of their infants were more likely (3.2 times) to use BMS than mothers with no MBS promotion exposure, this finding is supported by research finding in Philippine [35, 36], United states of America (USA) [37] and Lao. Possible reason may be, at the end of third trimester, Its local culture for pregnant woman to call neighbors and relatives for ceremonial dinner at home to ask almighty God for safe delivery, these individuals discuss on what best for lactating mothers and infants, since there is high promotion of breastmilk substitutes through televisions and by female merchants, these people may advise mothers to give breastmilk substitutes.

However, the study has some limitations, firstly, the study was conducted in urban setting, in which comparing rural and urban was not possible. Secondly, this study was designed to collect data retrospectively, by history, there would be recall bias. But to reduce the recall bias, data were collected by interviewing the mothers to give their response in reference to different events, religious and seasonal calendars.

5. Conclusion

This study found that lack of breastfeeding counselling during antenatal and postnatal visits, age of the infants older than three months, infants with illness at delivery, exposure of BMS promotion and low confidence of mothers to breastfeed infants, were found to have influence on use of BMS among mothers with infants less than six months in the study area.

6. Recommendation

Strengthening Social behavioral change communication, particularly, age specific counselling on EBF at health facilities during antenatal and early postnatal visits, local Medias, Like, Somali regional televisions and Ethiopian TVs should also be used to promote optimal exclusive breastfeeding to improve mother's confidence to exclusively breastfeed the infants and counteract promotion of breastmilk substitutes from others TVs in Somalia and female merchants.

Acknowledgements

We are very grateful to the Jigjiga University for supporting this study during data collection. We are also very grateful and extend our appreciation to the study participants (mothers) who shared their crucial time, the supervisors, and the data collectors for their full commitment for participation and technical support.

References

- [1] Lutter, C. K., The International Code of Marketing of Breast-milk Substitutes: lessons learned and implications for the regulation of marketing of foods and beverages to children. *Public health nutrition*, 2013. 16 (10): p. 1879-1884.
- [2] Turner, S., Examining the relationship between infant feeding practices and child hyperactive/inattentive behaviours in a Canadian sample. 2016.
- [3] Selbyville and Delaware. Breast Milk Substitute Market Insight. *Global Market Insight*. 2020. 12 (3372).
- [4] Bosi, A. T. B., et al., Breastfeeding practices and policies in WHO European region member states. *Public health nutrition*, 2016. 19 (4): p. 753-764.
- [5] Agbozo, F., et al., Compliance of a baby-friendly designated hospital in Ghana with the WHO/UNICEF baby and mother-friendly care practices. *Journal of Human Lactation*, 2020. 36 (1): p. 175-186.
- [6] WHO, Global nutrition targets 2025: breastfeeding policy brief. 2014, World Health Organization.
- [7] Fehr, E. and A. Rangel, Neuroeconomic Foundations of Economic Choice--Recent Advances. *Journal of Economic Perspectives*, 2011. 25 (4): p. 3-30.
- [8] Group, N. S., Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. *The Lancet Global Health*, 2016. 4 (4): p. e266-e275.
- [9] Ladomenou, F., et al., Protective effect of exclusive breastfeeding against infections during infancy: a prospective study. *Archives of disease in childhood*, 2010. 95 (12): p. 1004-1008.
- [10] Tariku, A., et al., Mothers' education and ANC visit improved exclusive breastfeeding in Dabat Health and Demographic Surveillance System Site, northwest Ethiopia. *PLoS One*, 2017. 12 (6): p. e0179056.
- [11] Masho, S. W., M. R. Morris, and J. T. Wallenborn, Role of marital status in the association between prepregnancy body mass index and breastfeeding duration. *Women's Health Issues*, 2016. 26 (4): p. 468-475.
- [12] Chekol, D. A., et al., Exclusive breastfeeding and mothers' employment status in Gondar town, Northwest Ethiopia: a comparative cross-sectional study. *International breastfeeding journal*, 2017. 12 (1): p. 27.
- [13] Pries, A. M., et al., Pervasive promotion of breastmilk substitutes in Phnom Penh, Cambodia, and high usage by mothers for infant and young child feeding. *Maternal & Child Nutrition*, 2016. 12: p. 38-51.
- [14] WHO, Country implementation of the international code of marketing of breast-milk substitutes: status report 2011. 2013.
- [15] Mekuria, G. and M. Edris, Exclusive breastfeeding and associated factors among mothers in Debre Markos, Northwest Ethiopia: a cross-sectional study. *International breastfeeding journal*, 2015. 10 (1): p. 1.
- [16] Shifraw, T., A. Worku, and Y. Berhane, Factors associated exclusive breastfeeding practices of urban women in Addis Ababa public health centers, Ethiopia: a cross sectional study. *International breastfeeding journal*, 2015. 10 (1): p. 22.
- [17] Asemahagn, M. A., Determinants of exclusive breastfeeding practices among mothers in azezo district, northwest Ethiopia. *International breastfeeding journal*, 2016. 11 (1): p. 22.
- [18] Santo, L. C. d. E., L. D. De Oliveira, and E. R. J. Giugliani, Factors associated with low incidence of exclusive breastfeeding for the first 6 months. *Birth*, 2007. 34 (3): p. 212-219.
- [19] Chudasama, R. K., C. D. Amin, and Y. N. Parikh, Prevalence of exclusive breastfeeding and its determinants in first 6 months of life: a prospective study. *Online Journal of Health and Allied Sciences*, 2009. 8 (1).
- [20] Howard, C., et al., Office prenatal formula advertising and its effect on breast-feeding patterns. *Obstetrics & Gynecology*, 2000. 95 (2): p. 296-303.
- [21] Doherty, T., et al., A longitudinal qualitative study of infant-feeding decision making and practices among HIV-positive women in South Africa. *The Journal of nutrition*, 2006. 136 (9): p. 2421-2426.
- [22] Seid, A. M., M. E. Yesuf, and D. N. Koye, Prevalence of Exclusive Breastfeeding Practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia: a community based cross-sectional study. *International breastfeeding journal*, 2013. 8 (1): p. 14.
- [23] Setegn, T., et al., Factors associated with exclusive breastfeeding practices among mothers in Goba district, south east Ethiopia: a cross-sectional study. *International breastfeeding journal*, 2012. 7 (1): p. 17.
- [24] Mogre, V., M. Dery, and P. K. Gaa, Knowledge, attitudes and determinants of exclusive breastfeeding practice among Ghanaian rural lactating mothers. *International breastfeeding journal*, 2016. 11 (1): p. 12.
- [25] Jones, J. R., et al., Factors associated with exclusive breastfeeding in the United States. *Pediatrics*, 2011. 128 (6): p. 1117-1125.

- [26] WHO, The international code of marketing of breast-milk substitutes: frequently asked questions. 2008.
- [27] RHB, report on Health infrastructure in Somali region, in Yearly health bulletin. 2019. p. 1879-1884.
- [28] Laillou, A., et al., Is the legal framework by itself enough for successful WHO code implementation? A case study from Ethiopia. *Maternal & Child Nutrition*, 2020: p. e13059.
- [29] RHB, report on Health infrastructure. 2019, Regional Health Bureau.
- [30] Gatiba, M., Determinants and Timing of Use of Breast Milk Substitutes among Mothers of Infants between the Ages of 3 to 6 Months in the Ledzokuku-Krowor Municipality in Accra. 2013, University of Ghana.
- [31] Teka, B., H. Assefa, and K. Hailelassie, Prevalence and determinant factors of exclusive breastfeeding practices among mothers in Enderta woreda, Tigray, North Ethiopia: a cross-sectional study. *International breastfeeding journal*, 2015. 10 (1): p. 2.
- [32] Yeneabat, T., T. Belachew, and M. Haile, Determinants of cessation of exclusive breastfeeding in Ankesha Guagusa Woreda, Awi Zone, Northwest Ethiopia: a cross-sectional study. *BMC pregnancy and childbirth*, 2014. 14 (1): p. 262.
- [33] Mensah, K. A., et al., Determinant the practice of exclusive breastfeeding among nursing mothers in a peri-urban district of Ghana. *BMC research notes*, 2017. 10 (1): p. 466.
- [34] Tan, K. L., Factors associated with exclusive breastfeeding among infants under six months of age in peninsular Malaysia. *International breastfeeding journal*, 2011. 6 (1): p. 2.
- [35] Sobel, H. L., et al., Is unimpeded marketing for breast milk substitutes responsible for the decline in breastfeeding in the Philippines? An exploratory survey and focus group analysis. *Social science & medicine*, 2011. 73 (10): p. 1445-1448.
- [36] Phouththakeo, P., et al., Cross-border promotion of formula milk in Lao People's Democratic Republic. *Journal of paediatrics and child health*, 2014. 50 (1): p. 51-56.
- [37] Alayón, S., et al., Using Behavioral Theory to Evaluate the Impact of Mass Media on Breastfeeding Practices in Vietnam: Evaluation Plan and Baseline Findings. Washington, DC: Alive & Thrive, 2013.