ADDIS ABABA UNIVERSITY
FACULTY OF MEDICINE
SCHOOL OF PUBLIC HEALTH

Assessment of Association Between Perinatal Common Mental Disorders and Breast-Feeding Practice Among Postnatal Women in Butajira, SNNP, Ethiopia, 2014 (A Retrospective Cohort Study)

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Acronyms

ARI……Acute Respiratory Infection

BDIS …….Beck Depression Inventory Score

BRHP……Butajira Rural Health Programme

BSE……Breast feeding Self Efficacy

CPMD…...Common Perinatal Mental Disorders

CMD…....Common Mental Disorders

CSA ……...Central Statistical Agency

DSS.....Demographic Surveillance Site

EDHS …….Ethiopian Demographic and Health Survey

EPDS……. .Edinburgh Post Partum Depression Score

HSDP……..Health Sector Development Program

IYCFP…….Infant and Young Child Feeding Program

LBW……Low Birth Weight

MRA……Maternal Role Attainment

ORS…….....Oral Rehydration Solution

PPD……..Post-Partum Depression

PPDS……...Post-Partum Depression Score

P-MaMiE….Perinatal Maternal Mental disorder in Ethiopia

PDS……..Peasant Dweller Association

PI……..Principal Investigator

SNNPR……Southern Nations, Nationalities and People Region

SRQ……..Self Reporting Questionnaire

UDAs……Urban Dwellers Associations

UNICEF…...United Nations Children's Fund

WHO ……World Health Organization

Abstract

Back-ground: Perinatal Common Mental Disorders (CMD) is a neglected serious public health problem which can have long lasting effects on the mother, her child and her family. Even though breast-feeding is nearly universal in Ethiopia (98%), most mothers do not follow the recommendations in the Global Infant and Young Child Feeding Guideline. To date, the association between CMD and breastfeeding practices has not been examined in a population study in Sub-Saharan Africa. The aim of this study is, therefore, to assess the association between perinatal CMD and optimal breast - feeding pattern of women in a Demographic Surveillance Site at Butajira, Ethiopia in 2014.

Methodology: Secondary data analysis was carried out using data from the P-MaMiE project in Butajira DSS. A total of 1065 eligible women were recruited in the P-MaMiE project in the third trimester of pregnancy. Antenatal and postnatal CMD were measured using the pre-validated Amharic version of Self-Reporting Questionnaire (SRQ-20). The data analysis was performed using statistical analysis such as, Survival Analysis and Poisson Regression using SPSS version 21 and STATA version 12 soft wares.

Result: All women were breast feeding at two months and only 16 women discontinue breast feeding before one year. The mean duration of breast feeding was 22.3 months. Only 43(4.7%) of children were given pre lacteal feeds. The cox regression revealed that ethinicity; (Mareko, AHR=1.51, 95% CI: (1.05, 2.17), Silte, AHR=1.45, 95% CI: (1.10,1.91)), maternal age; (35-49 years AHR= 0.49, 95% CI : (0.28, 0.86),obstetric complication; (AHR=1.35, 95% CI: (1.061, 1.72)), low birth weight ; (AHR=0.40, 95% CI: 0.19, 0.82), and parity; (1-2 children, AHR= 0.57, 95% CI: (0.35, 0.94), grand parouse, AHR=0.53, 95% CI: (0.39, 0.73)) are factors associated with discontinuation of breast feeding. however , there is no statistically significant association between perinatal CMD and discontinuation of breast feeding after controlling possible confounders; AHR=0.92, 95% CI: (0.65, 1.29). Mothers with antenatal CMD were almost two times more likely to give pre lacteal feeds to their child as compared to mothers with out antenatal CMD after controlling socio demographic factors and other confounders, (adjusted IRR=1.97, 95% CI: (1.01, 3.85). Residence; urban, (adjusted IRR=3.89, 95% CI: 2.02, 7.48), birth attendants; (health professional, IRR= 0.32, 95% CI: (0.10, 0.99)) were other determinant factors for pre lacteal feeding.

Conclusion and recommendation: Although CMD is not associated with discontinuation of breast feeding, it this study revealed as it has a significant association with that of pre lacteal feeding. Therefore, it is recommended for health professionals to consider CMD as one major factor that has negative impact on optimal breast feeding and it is needed to routinely screen for CMD and provide proper counseling on optimal breast feeding.

1. Background

CMD is a term used by Goldberg and Huxley to describe disorders that characterized by diffuse somatic symptoms, anxiety and depression states (1). Depression is a common mental disorder that presents with lower mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration (2). Depression was the fourth leading cause of global disease burden in 1990 and by 2020 it is projected to be the leading cause of years lived with disability and the second leading cause of disease burden (disability adjusted life years) worldwide (3). Depression has been considered to be a disease of developed countries; however, several studies from low and middle income countries (LAMICS) have shown that depression in pregnancy and in postnatal period is at least as prevalent as in high income countries, with estimated prevalence of 15.6% and 19.8% during pregnancy and in the postnatal period, respectively (4, 5).

Post-Partum Depression (PPD) is a type of clinical depression which occurs in the postnatal period. Definitions vary, but most research studies define PPD as depression with onset in the first 12 months after childbirth. PPD may last up to several months or even a year. Symptoms of PPD include sadness, hopelessness, low self-esteem, guilt, a feeling of being overwhelmed, sleep and eating disturbance, exhaustion, loss of interest and enjoyment, social withdrawal, low or no energy, becoming easily frustrated and feeling inadequate in taking care of the baby.

Several risk factors for perinatal CMD have been identified in high-income country settings: negative birth outcome (preterm or low birth weight), mode of delivery (cesarean section), lower parity, maternal and child illness, alcohol, substance use, gender-based violence, sexual assault, lack of social support, low educational level, lower maternal age, unemployment, marital status, like being single, separated and widowed, history of depression and anxiety during pregnancy as well as before pregnancy (6-10).

According to a recent systematic review, socioeconomic disadvantage, unintended pregnancy, low maternal age, being unmarried, lacking intimate partner, empathy and support, having

hostile in-laws, experiencing intimate partner violence, having insufficient emotional and practical support, giving birth to a female, and having a history of mental health problems are identified risk factors for perinatal CMD in LAMICs (11).

Perinatal CMD is a neglected and serious public health problem which can have long lasting negative effects on the mother, her child and her family (7, 12, 13). In LAMICs, CMD has been found to be independently associated with functional impairment (14). Women who suffer from CMD are less capable of carrying out maternal duties such as optimal breast-feeding, immunizations and engaging in important developmental activities with the new born (4, 12, 14). In many, although not all, studies from LAMICs, CMD is significantly associated with infant under-nutrition (15-17), increased risk of diarrhea and Acute Respiratory Infections (ARI) (17, 18), delayed initiation of breast feeding (19), impaired infant cognitive and motor development (15, 20) and even increased child mortality (21).

Several epidemiological studies conducted in developed countries found postpartum CMD to be a significant risk factor for early discontinuation of breastfeeding (9, 10, 17, 22-25) and early interruption of exclusive breast feeding (9, 26, 27), whereas, some other studies reported no association between CMD and breast-feeding practice (13, 28-31).

Breast-feeding has substantial benefits for both the child and the mother. Optimal breast-feeding is estimated to save 1.4 million lives each year, reduce 10% of disease burden among under five children (32), reduce ARI and diarrhea deaths by 50-95%, reduce the need for Oral Rehydration Solution (ORS) by more than 50%, significantly increase intelligence and readiness to learn, increase growth, and provide the majority of an infant's nutritional needs (33). In addition to prolonging child survival and promoting healthy infant development, breast-feeding has an important impact in reducing postpartum bleeding, reducing the risk of ovarian and breast cancer and contributing to a delay in the return of fertility after childbirth. Not only this but breast-feeding is also associated with attenuated stress responses, especially with that of cortisol and lactogenic hormones, like oxytocin and prolactin, which are postulated to have anti-depressant and anxiolytic effects (7). Recently, some studies identified that delayed initiation of breast-feeding, not exclusively breast-feeding and cessation of breast-feeding, are found to be

significant predictors of an increase in postpartum CMD (6, 10, 34-38). This suggests that optimal breast-feeding practices may be protective against postpartum CMD.

Even though breast-feeding is nearly universal in Ethiopia (98% of women breastfeed), most mothers do not follow the full recommendations of the Global Infant and Young Child Feeding Guideline which was established by WHO and UNICEF (33). According to the 2011 Ethiopian Demographic and Health Survey (EDHS), initiation of breast feeding within one hour of delivery occurred 52% of the time, which falls below the Health Sector Development Plan (HSDP IV) target of 92% by 2015. Overall, 27% of children are given pre-lacteal feeds within the first three days of life. Only 52% of children are exclusively breast-fed up to six months. Even though exclusive breast-feeding showed a small increment from the 2005 to 2011 EDHS (49% to 52%), it seems that we are failing to achieve the HSDP IV target which is to increase the number of exclusively breast-fed infants to 70% by 2015 (39).

The association between CMD and breast-feeding is still controversial and, except few studies (13, 17, 28, 34), it has not been well studied in Sub-Saharan Africa or in Ethiopia. Thus, this study aims to test the following hypotheses:

- Perinatal CMD will have a negative effect on optimal breast-feeding practices leading to prelacteal feeding and discontinuation of breast feeding before two year.

The secondary data analysis was carried out using data from the P-MaMiE project that is an ongoing population cohort which was established in the Butajira DSS in 2005/2006. The outcome of this study may help policy-makers (e.g. within the Ministry of Health) to gain better understanding of the important public health impact of perinatal CMD in low-income countries and the salience of CMD to achieving the Millennium Development Goals. In addition, the study will contribute evidence to assist planners to design and integrate maternal mental health with the general maternal and child health service in order to enhance optimal breast-feeding practices in Ethiopia. The findings of this paper may encourage health professionals to routinely screen mothers for CMD, so that it is possible to prevent and intervene accordingly before it brings about irreversible damage both on mothers and their offspring.

2. Literature Review

2.1 Prevalence and Risk Factors of perinatal CMD

There is a variation on the prevalence of CMD among several studies conducted in different countries of the world. The presence and absence of the possible risk factors, methodological and sample size difference, the time gap and the different instrument they used are the possible reasons for this variation. According to a quasi-experimental study done in Pakistan, the overall prevalence of postpartum anxiety and depression was found to be 28.8%. Other studies conducted in Japan, Italy and Mexico reported that the prevalence of PPD was 13.9%, 15.7% and 24.55, respectively (9, 12, 26, 40). A longitudinal study in Norway showed that, the point prevalence of PPD at 6 weeks, 3 months and 6 months was 15.1%, 11.6% and 14.3%, in their respective order (12).

A recent systematic review revealed higher rates of common perinatal mental disorders (CPMD) among women from low and lower-middle-income countries, where the weighted mean prevalence of these disorders was found to be 15.6% (95% confidence interval, CI: 15.4–15.9) in pregnant women and 19.8% (95% CI: 19.5–20.0) in women who had recently given birth (5).

A comparative cross sectional study in Turkey reported that, the prevalence of PPD using Beck Depression Inventory (BDI) scores was 17% (13). But, other prospective study conducted in the same country, came up with a prevalence of PPD 9.6% using Edinburgh Postpartum Depression Score (EPDS) (28). From the P-MaMiE cohort in Ethiopia, the prevalence of antenatal and postpartum CMD using SRQ was 12 % and 5% among 1065 women followed from their third trimester (41).

Numerous studies have reported that there are several factors that put women at risk of developing PPD. However, risk factors are not consistently identified across studies. In contrast, two studies which are done in 2006 and 2008 identified similar factors for PPD. These are, prior history of depression, smoking cigarettes and formula feeding instead of breast feeding (8).

A study conducted on peri-urban communities of Karachi Pakistan found that domestic violence, difficulty in breast feeding at birth and unplanned pregnancy are significantly associated factors with postpartum CMD (42). unemployment, low education, poverty, poor family relations, low marital age, lack of medical services, and mental health problems have been cited as risk factors in eastern Turkey (43).

Studies also demonstrate that CMD is associated with mother's occupation, child sex, LBW, multiple birth, child illness, maternal illness like anemia, thyroid deficiency, low maternal age, gap between the last and the new baby, number of children and sexual assault (6, 44). Two meta-analyses have identified significant risk factors for CMD. In one of the meta analysis which was published in 2001, 84 studies from Europe, N. America, S. America, Asia, Japan, Australasia, Africa, Middle East, and China were included and a total of 13 significant risk factors were identified. These are prenatal depression, low self-esteem, difficulties with child care, prenatal anxiety, a high stress level, a low level of social support, poor marital relationship, a history of depression, difficult infant temperament, and maternity blues. Three had a small, but significant relationship to postpartum depression: single marital status, low socioeconomic status, and an unplanned or unwanted pregnancy (45).

According to the other meta-analysis conducted in 2004, the strongest risk factors were prenatal depression prenatal anxiety, stressful life events (usually within the previous year), lack of social support, and a history of depression before the pregnancy occurred. Moderate risk factors are poor marital relationship and neuroticism. Low socioeconomic status and obstetric factors (including parity, cesarean section deliveries and complications due to pregnancy or delivery) were characterized as small risk factors (46). In contrast, other studies did not find a significant association between obstetric factors and CMD (44, 47).

Studies from Ethiopia illustrated that living in rural villages, having frequent chat chewing habit, having seasonal job, living in extreme poverty were factors independently associated with depression. On the other hand, experiencing physical violence, childhood sexual abuse, emotional violence and spousal control were factors associated with depressive episode among married women in rural Ethiopia. A Qualitative study carried out on postnatal distress in relation to the socio-cultural practices of childbirth in Ethiopia, revealed that, supernatural attack, physical harm, economic strain, cultural norms are identified risk factors for postnatal distress in rural Ethiopia (48). Other study done in this similar area elaborated that women who endorsed protective and celebratory perinatal practices, but were unable to complete them had increased odds of incident (adjusted OR = 7.26, 95% CI: 1.38, 38.04) and persistent postnatal CMD

(adjusted OR = 2.16, 95% CI 1.11–4.23), respectively. Suggesting that perinatal sociocultural practices have an effect on persistence of Postnatal CMD (49).

2.2 Factors for Discontinuation of Breast Feeding

Various studies identified several factors for discontinuation of breast feeding before 2 year. Socio demographic factors like non-white ethnic group(50, 51), religion(52), residence(52), higher education level(19, 40, 50), family income(53), older maternal age(19, 40, 50, 54), age at the time of marriage(52) unemployment (40, 50, 53, 55-57) are positively associated factors for longer duration of breast feeding. Among the obstetric factors like parity(10, 19, 53, 54, 58), having preterm baby(10, 55), CS delivery(10), pleural birth(10), use of contraceptives(52), not getting professionals, partner and other social support (40, 53, 57-59) are risk factors for discontinuation of breast feeding. In association with breast feeding, studies reported that positive breast feeding intention, had breastfed before, early initiation of breast feeding and continuing breast feeding exclusively up to 4 month found to increase the total duration of breast feeding (40, 50, 53) Insufficient milk, sore nipple, breast pain, other maternal illness(55), maternal obesity(40, 60) and smoking (10, 40, 60) are important predictors for discontinuation of breast feeding.

2.3 Breast Feeding Practice in Ethiopia

According to Ethiopian national survey, breast feeding is almost universal in Ethiopia (98% children are breastfed for some period of time) (39). However different studies reported that there is some variation on this percentage. Study done in Derashe, southern part of Ethiopia stated that breast feeding was 80.2% at the time of the study (61). Another study done in 9 regions of Ethiopia reported that overall

rate of any breastfeeding (both EBF and PBF) 68.2% (62). Exclusive breast feeding practice is 52% Ethiopia(39) and it is about 49.0% in another large scale study conducted in all over Ethiopia. Study in Nekemete reported that 84.2% women were exclusively breast feeding between 4-6 month(63) and EBF is 49.01 %, 71.3 % and 71.7%, in Jimma (64), Goba (65) and Keresa DSS (66) respectively. Marital status(62, 66), wealth index (62), ownership of radio (64), access to health facility, knowledge about IYCF (66), being unemployed and child age (62, 65) are important predictors of exclusive breast feeding in Ethiopia.

2.4 Prelacteal Feeding

There is a variation on prelacteal feeding practice in different countries of the world. Prelacteal feeding is 89.9%, 73.3%, 58%, 57%, 26.5%, 16.6%, in Bangladesh, Vietnam, Egypt, Uganda, Nepal and India respectively (67-72). Studies identified several predictors for prealacteal feeding. These are urban residence, religion, lower maternal education, middle wealth quintile, formal marriage, unemployment, attending ANC , maternal obesity, birth preparedness, early initiation of breast feeding, birth attendants, CS delivery, female babies, low birth weight, a perceived inability to suckle normally after birth was closely related to the risk of an infant being fed a food other than breast milk, delayed initiation of breast feeding, first time mothers and breast pain were significantly associated factors with prelacteal feeding (69-73).

In Ethiopia, prelacteal feeding is 27% and it is more common in rural (28%) than urban (24%) areas. (39). It is most commonly practiced in Somali (73%) region and only 10% in SNNP. In other study the proportion of women who gave pre-lacteal feeding within the first three days of life was 13% (62). Prelactelal feeding is 7.8% in Jimma (64), 75.8% in Keresa, (66), 17.1% in Goba (65) and 63% in Kossoye, a rural Amhara village(74). Factors associated with prelacteal feeding in Ethiopia are belief that it will clean the stomach especially if unsalted butter is given to the child. In that study, 62% rural mothers were significantly more likely than those in urban Gondar to give prelacteal butter. It is also thought that prelacteal fluids were to 'clean the baby's throat' if it is given over the first 3 days of birth(74). However no studies came across to prove this belief before.

2.5 Effects of perinatal CMD on Breast Feeding Practice

Many studies have suggested a correlation between depressive symptoms and early termination of breastfeeding. The results from a qualitative systematic review suggest that women with depressive symptomatology in the early postpartum period may be at increased risk for negative infant feeding outcomes including, delayed initiation of breast feeding, decreased breastfeeding duration, increased breastfeeding difficulties and decreased levels of breastfeeding self-efficacy (75).

A comparative cross sectional study done in perinatology teaching hospital in Mexico showed that the proportion of mothers who performed on-demand feeding, restricted time on each breast, or preferred to breastfeed from one breast over the other, did not differ between depressed and not depressed mothers. However, significantly more depressed women offered supplemental food to their infants (X = 7.68, P= 0.006) than non-depressed women (9). In contrast, other institution based comparative cross sectional study conducted in Turkey stated that, the effect of depression on breast-feeding was not statistically significant (P = 0.7) (13).

Studies suggests that effect of PPD on discontinuing breast feeding depends on the severity of the depression state Edinburgh Post Partum Depression Score (EPDS). In 2011, a cohort study which aimed to identify risk factors for discontinuing breast feeding in Brazil demonstrated that, among the several factors identified, symptoms of maternal depression was one of the independently associated factor for discontinuation of breast feeding. And those women with moderate and severe depression are at higher risk of discontinuing than women with lower level after adjusting for possible confounders. (Low levels: RR = 1.59, 5% CI 1.02–2.47; moderate to severe: RR = 2.03, 95% CI: 1.35, 3.01) (24). This is in accordance with a recent longitudinal study conducted at one and five month postpartum among 405 women in three hospitals in Tokyo. In their study, Women with high EPDS score at 1 month are more likely to feed formula milk at 5 months than women with lower EPDS score at 1 month post-partum. (P=0.01) (23). A similar study in Italy reported that, those mothers who have a higher EPDS score immediately after delivery (within the first two to three days after delivery) are more likely inclined to bottle feed at three months. The odds of bottle feeding increased with EPDS result, even at lower scores (OR=1.06, 95% CI: 1.01, 1.11)(26). Other supporting study in Canada found that, mothers with an EPDS >12 (suggesting that the women has CMD) at 1 week postpartum were significantly more likely to discontinue breastfeeding at 4 and/or 8 weeks (25). In contrast, a study done in USA found no significant relationship between severity of PPD and discontinuation of breast feeding (30). Similarly, a hospital based comparative cross sectional study conducted on 1200 Chinese women in Hong Kong, found no significant association between postnatal depressive symptom and breast feeding practice (29).

Postpartum CMD is not only associated with discontinuation of breast feeding, but there is a significant difference on the total duration of breast feeding among depressed and non-depressed mothers. As well the mean duration of breast feeding is significantly lower among women with early onset depression than women with late onset depression (27). Conversely, a case control study conducted in urban southern Brazil did not find any significant association between PPD and early termination of breast feeding at four months after delivery (31).

In 2008, a study conducted in Nigeria showed that depressed mothers were more likely to stop breastfeeding earlier and their infants are more likely to have episodes of diarrhea and other infectious illnesses (17). A similar study done in the same year in Turkey concluded that women with higher EPDS score on one month are at higher risk to cease breast feeding at four months after delivery (34).

A recent cohort study with 429 families evaluated the association between PPD and interruption of exclusive breastfeeding. It identified that children of mothers with postpartum depressive symptoms had 1.81 and 1.21 times greater risk of early interruption of exclusive breastfeeding in the first and second months postpartum, respectively (76). In contrary, a prospective study conducted at 48 hours and six weeks after delivery demonstrated that, PPD has no significant effect on the exclusive breast feeding practice (28).

As all the above studies revealed, there is controversial on the association between maternal CMD and breast feeding practice. Therefore this study tries to consider all the identified potential confounders and assess the association between maternal CMD and breast feeding practice.

3 Objectives

3.1 General objective

- ✓ To assess the association between perinatal CMD and optimal breast - feeding practice of women in a Demographic Surveillance Site at Butajira, Ethiopia in 2014.

3.2 Specific Objectives

- ✓ To assess time to discontinuation of breast-feeding among women with CMD and without CMD.
- ✓ To assess the prelacteal feeding practice between women with CMD and without CMD.

Hypothesis

- ✓ Women with CMD are more likely to discontinue breast-feeding than women without CMD within two years postpartum period.
- ✓ Those women with antenatal CMD are more likely to practice prelacteal feeding than women without CMD.

4 Methodology

4.1 Study Area and Period

The study is conducted in Meskan, Mareko and Silte Districts, Gurage Zone, in the Southern Nations Nationalities and Peoples Regional state (SNNPR) of Ethiopia from November 2013 up to June 2014. Butajira, is located 130km away south of the capital city, Addis Ababa. The majority of the people are Orthodox Christians and Muslims. The common ethnic groups in the district are Meskan, Mareko, Silte and Sodo. The residents are predominantly farmers whose subsistence is on cultivation of maize and "false banana" or Ensete (Enseteventricosun) which form the main staple diet. Khat (Catha edulisForsk) and chilli-peppers are the main cash crops{Charlotte Hanlon, 2010 #83}. Butajira has one governmental hospital, one health center and several private-owned drug stores and clinics. Maternal mortality rates are estimated at 400–850/100,000 live births.

The Butajira DSS was established in 1986 with the main objective of generating continuous and valid data on vital statistics. Since 1987 all households in a defined geographical area have been visited every three months in order to document births, deaths and migration. The DSS includes nine peasant dwellers associations (PDS) from different ecological zones and one urban dweller association (UDA) in Butajira town, which were selected using the probability proportional to size (PPS) method from Meskan and Mareko district. The P-MaMiE study is a closed cohort located within the Butajira DSS. This was established between July 2005 and March 2006 when 1065 women who were in the third trimester of pregnancy were recruited. Women were not included unless they can speak Amharic. Both mothers and children remain under regular follow-up (the children now between 6.5 and 7.5 years of age).The primary aim of the P-MaMiE project is to estimate the effects of CMD on the mother, child growth, development and mortality. In the P-MaMiE study, 54.5% of women received antenatal care, nearly 11.3% delivered in a health facility and 24.2% of all deliveries were attended by trained professionals.

4.2 Study Design

A retrospective cohort study design was used to compare breast feeding practice among women with Perinatal CMD (exposed) and women without perinatal CMD (non- exposed) using secondary data of a population based cohort study (P-MaMiE) from third trimester pregnancy up to two year postpartum.

4.3 Target population

All pregnant women who live in Butajira

4.3.1 Source Population

All pregnant women who live in the Butajira DSS.

4.3.2 Study Population

All third trimester pregnant women who were recruited and remained under follow up in the P-MaMiE study from pregnancy to two years postpartum. All women with perinatal CMD were categorized as exposed group and those women without perinatal CMD as unexposed group.

Inclusion Criteria

All third trimester pregnant women who are in the regular follow up of the P-MaMiE study.

Exclusion Criteria

Postnatal women who had still births, multiple birth and neonatal death and infant death.

4.3.3 Sample Size Determination

Even though we used secondary data and included all the women who were in the P-MaMiE project, we checked the detection power of the available sample size for each specific objective. The sample size was calculated on Open Epi with the following assumptions: using 4:1 ratio of unexposed (No perinatal CMD) to exposed (pre or post natal CMD) groups, 95% CI and 80% detection power and the percentage of outcome among unexposed and RR were different for specific objectives.

For the first objective

The prevalence of continued breast feeding until 2 year is 82 % in Ethiopia; this means that 18% of women discontinue breast feeding before 2 year. Therefore, percentage of outcome among unexposed was 18%. Different studies reported that the relative risk of discontinuation of breast feeding ranges from 1.21-2.03. In this study, we want to assess discontinuation of breast feeding before 2 year using a minimum relative risk of 1.7. Finally, the calculated sample size was 117 women with CMD in the exposed and 468 women in the unexposed group after using fleiss with continuity correction. However, in the P-MaMiE study, 1065 women were recruited. Among these women; 126 women with CMD (either at pregnancy or 2 month post partum) in the exposed and 797 women without CMD in the unexposed group were included.

For the second objective

Prelacteal feeding is 27 % in Ethiopia. In this study, we want to assess prelacteal feeding practice using a minimum relative risk of 1.5. The calculated sample size was 126 women with CMD in the exposed and 502 women in the unexposed group using fleiss with continuity correction. However, in the P-MaMiE study, 1065 women were recruited. Among these women; 119 women with CMD at pregnancy in the exposed and 887 women without CMD in the unexposed group were included. These might reduce the detection power. However, there are larger numbers of women in unexposed group. These may compensate the reduced power.

Cohort Description

Among 1065 pregnant women who were recruited in the P-MaMiE cohort, there were 40 stillbirths, 16 multiple births, three losses to follow-up before delivery (one pregnant woman died and two pregnant women out-migrated), and 1006 singleton live births and women. Among these 1006 women, 119 (11.8%) of women were having antenatal CMD at their third trimester pregnancy. Therefore, one hundred nineteen women in the exposed and 887 (88.2%) in the unexposed group, a total of 1006 new born and women are included in the analysis which was done to assess the prelacteal feeding practice among women with CMD and women without CMD. There were 35 neonatal deaths, 10 children died before 2 month, 32 infants deaths between 2 month and 2.5 year and 6 missing values were excluded from the analysis. Therefore,

a total of 923 women (126 exposed and 797 unexposed) were included in the analysis for the first objective which is time to discontinuation of breast feeding. A flow chart of the recruitment, follow-up and number of women included for each objective is presented in figure 1

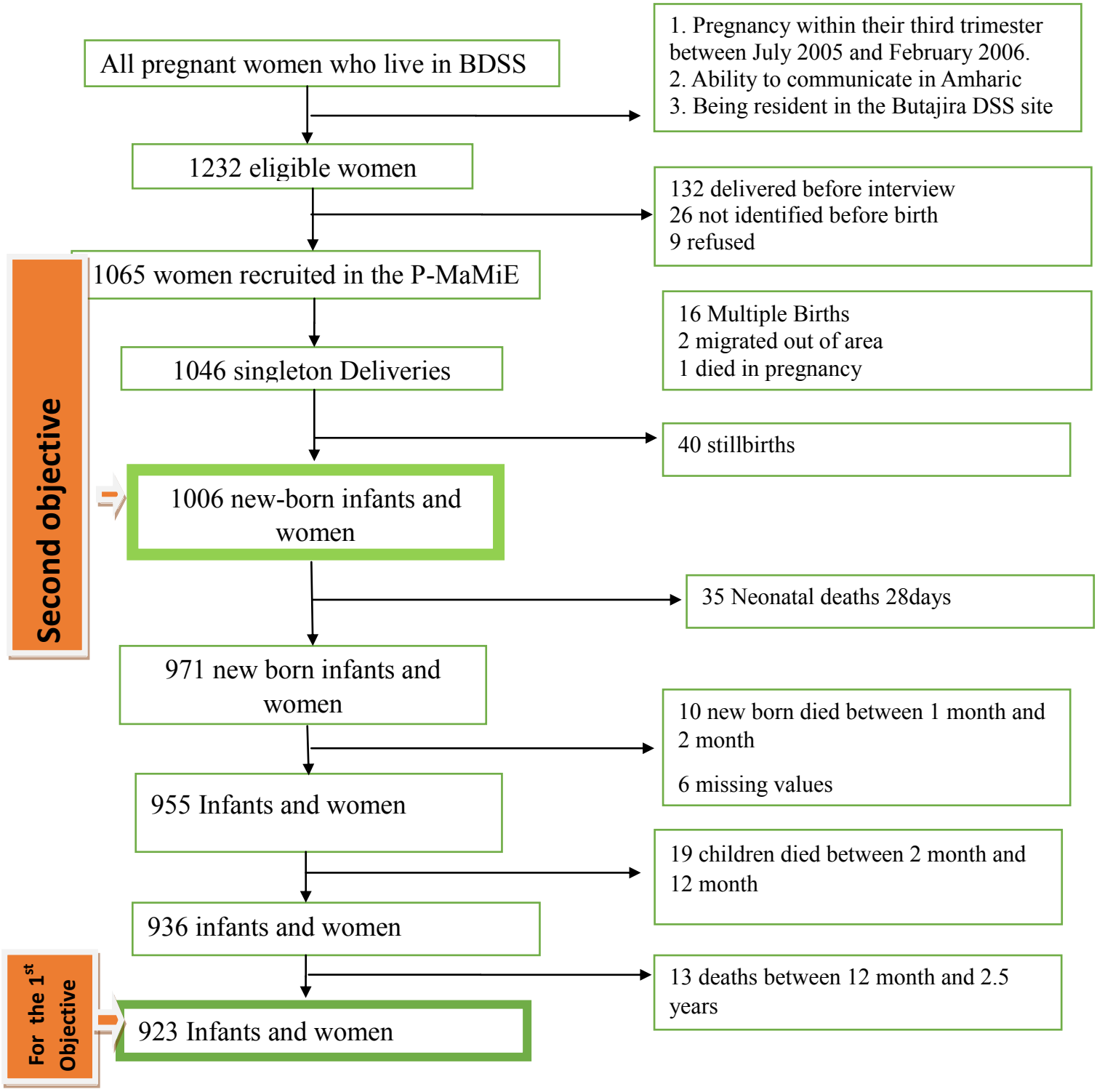

Figure 1: Sampling Procedure

4.4 Data collection Procedure

4.4.1 Data Instrument

The study is conducted using secondary data from the P-MaMiE project located in Butajira DSS. The perinatal CMD was measured using the SRQ-20. All questionnaires were translated into Amharic and administered to the study participants.

This 20-item scale asks about depressive, anxiety and somatic symptoms present in the preceding month, generating a continuously distributed scale score indicating level of overall psychological morbidity. The SRQ was extensively pre-validated for use in a mixed sample of pregnant and postnatal women in the Butajira population and it has higher internal consistency.

4.4.2 Data Collectors

Although this study used secondary data, the data collectors were local women who completed high-school education and worked exclusively on the P-MaMiE project and had been trained for a minimum of one week in questionnaire administration. They interviewed participating women during their pregnancy, two months and one year after delivery covering all the pregnancy and post-partum variables. In addition to this, the BRHP enumerators and traditional birth attendants obtained additional information shortly after birth.

4.4.3 Data Quality Management

Supervisors monitor data quality and missing data in the field. Women were re-interviewed within one week if data was missing. After checking the completeness, the data were entered on the day it is obtained using EpiData, double-entered and checked for consistency by the project administrator. The overall progress and quality of the reported data was checked by the project coordinators.

4.5 Study Variables

I. For the first objective

Dependent variable

- Time to discontinuation of breast-feeding from birth up to 2 year.

Independent variable

- Perinatal CMDs during (antenatal and 2 month)
  (Women with CMD at least once and women with-out CMD none of the two time points)

II. For the second objective

Dependent variable

- Prelacteal feeding

Independent variable

- Antenatal CMD at third trimester pregnancy indicated by SRQ score

Possible confounding factors measured

a) **Socio demographic factors:** maternal age, educational level (mother and father), work, ethnicity, religion, residence, marital status, type of marriage, marriage consent.
b) **Socioeconomic factors**: husband unemployment, poverty level, subjective poverty indicators, like presence or absence of (i) hunger in the preceding month due to lack of money or food, (ii) subjective report of wealth relative to others, (iii) indebtedness, (iv) availability of resources to care for family for four weeks in the event of an emergency.
c) **Obstetric factors:** Parity, birth weight, child sex, history of postpartum complications, mode of delivery (CS), duration of labour, profession of birth attendants, utilization of ANC.
d) **Child and maternal illness:** baby illness, breast pain and maternal illness.
e) **Maternal behavior:** chat chewing and alcohol consumption.

Socio demographic factors: except subjective poverty indicators which are measured at two month postpartum, all socioeconomic and socio demographic factors were measured at baseline (at third trimester pregnancy). Among all the asset variables, six of them (ownership of a

business, bed & radio, availability of a latrine & sanitary means for disposal of rubbish, having a window within the home) were used to indicate the living standard of the respondents. A hierarchical living standard scale of these six items was confirmed using Mokken analysis (Loevinger H. coefficient 0.45) (49). For the variable poverty, the total score out of the six variables were changed in to percentage and categorized as < 20 % as poor and >20 % as non poor.

Among obstetric factors, only parity and utilization of ANC were measured at antenatal period, while birth weight, child sex, current postpartum complications, mode of delivery, duration of labour and birth attendants were measured within a week after delivery.

The remaining factors, like maternal & infant illness, maternal behavior and maternal CMD were repeatedly measured at third trimester, two month and 12 month post partum. All these variables were taken from two month measurement. And other few variables, such as breast feeding, infant feeding problem and maternal CMD at 12 month were taken from the 12 month measurement as a confounder.

4.6 Data Analysis Procedures

The data were entered into EpiData and cleaned and extracted using the prepared check list. Then, the data was transferred and analyzed by SPSS version 21 and Stata 12. Since this study is using secondary data, there is one important variable with missing value > 5%. This is time to discontinuation of breast feeding which has 52 (5.6%) missing values. Therefore, it was managed using simple imputation method on the SPSS 21 using the series mean values. There were 6 cases, which have missing values for about 62 important variables, therefore, all these women were deleted from the analysis.

For the first objective

Time to discontinuation of breast feeding was compared among groups of women with CMD at least at one time of the two time points (either at third trimester pregnancy or two month) and women without CMD by survival analysis using cox proportional hazard regression. Time to discontinuation of breast feeding was calculated starting from birth up to 23 month post partum

period. Therefore, a total of 923 women were included in the survival analysis followed for a total of 23 month. According to WHO IYCF indicators, those women who breast-fed their children until 23 month were not taken as discontinuation of breast feeding before 2 years, rather considered as fully breast fed up to 2 years. Total time contributed by women whose child is died between two month- two year were excluded from the analysis, because the exact time when they stop breast feeding before the child died was not known.

Bivariate analysis was done for all of possible predictors using Kaplan Meir analysis and it was checked by bivariate cox regression. Variables with the log rank value < 0.05 on Kaplan Meir and the omnibus tests of model < 0.05 on bivariate cox regression were considered as having significant association with that of discontinuation of breast feeding at two year.

In the bivariate cox regression, there were six variables which have significant association with discontinuation of breast feeding ($p< 0.05$). Although, education did not reveal any significant association in its category compared to the reference category, the Omnibuis test of model coefficient suggested as having significant (0.027) association with discontinuation of breast feeding. Therefore, it was considered as significant variable. And there were 16 variables with $p < 0.2$. For this reason, since the model cannot hold all these variables, only the significant variables and exposure variable (CMD at pregnancy and two month), with a total of eight variables were included in the multivariate cox regression model using enter method. The other factors which were suspected to be a possible confounder were included in the model. Even if some variables were significantly associated with the exposure variable, since they did not have significant association with that of the outcome variable, such variables were considered as non-confounders. Presence of multicolinearity was checked on stata 12 and significance of the model to be used were checked from the Omnibuis test of model ($p= 0.000$).

The assumption of proportional hazard was checked on Stata version12 by the Schoenfield residuals proportional hazard test and the global test was 0.4039 which was > 0.1, suggesting that proportional hazard assumption is fulfilled. All variables were double checked on the observed and predicted graph and – ln –ln graph. Both graphs confirmed that the assumption is

fulfilled. Crude and adjusted Hazard ratio with 95% CI is presented on tables and time to discontinuation of breast feeding is displayed using graphs.

For the second objective

The effect of CMD on prelacteal feeding practice was compared between 119 women with antenatal CMD and 887 women without antenatal CMD with a total of 1006 women. The analysis was done using Poisson regression on STATA software version12. Bivariate logistic regression analysis was done for each independent variable. Including the exposure variable there were only four variables which had significant (P value < 0.05) association with the outcome variable. All significant variables and three other important variables from literature were included in the final multivariate Poisson regression model. The crude and adjusted IRR with 95% CI is presented using tables.

4.7. Ethical Considerations

Ethical clearance of this study was obtained from the research ethics committee of School of Public Health and Institutional Review Board of College of Health Science, Addis Ababa University. Permission is obtained from P-MaMiE project in BRHP.

Written informed consent was given for participants. The data were collected in their house and it was tried to keep the privacy of the women. Both mothers and children who participated in the P-MaMiE project have been given free health service. The confidentiality of the participants is kept very well. Except the principal investigator and two data cleaners, no other person has access to the data and no personal identifier is attached in the data extraction tool.

Operational definitions (WHO recommendation)

1. **CMD:** disorders that characterized by diffuse somatic symptoms, anxiety and depression states.
2. **Women with CMD (exposed):** women who score ≥6 using SRQ either at third trimester or two months or 12 months postpartum. Or women with persistent CMD.
3. **Women without CMD (unexposed):** women who score < 6 using SRQ either at third trimester or two months or 12 months postpartum. Or women with persistent CMD.
4. **Discontinuation of breast feeding:** total cessation of breast feeding within two years postpartum.
5. **Prelacteal feeding:** anything other than breast milk given before initiation of breast milk.
6. **Early initiation of breastfeeding:** initiating breast feeding within the first one hours of birth, either she puts the baby to the breast or the baby is given any of the mother's breast milk.
7. **Exclusive breastfeeding:** nothing but only breast milk from his/her mother or expressed milk and no other liquids, or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines (WHO 1991).
8. **Predominant breastfeeding:** major source of nourishment is breast milk but the infant may also receive plain water or water-based drinks (such as sweetened or flavored waters, teas and infusion (WHO 1991).
9. **Less frequency of breast feeding:** women who breast fed their child in the day or night time less than 6 time in the previous day.
10. **On demand:** if the mother breast fed the child on demand and if it is above 6 times per day time or per night.
11. **Peri natal CMD:** type of CMD which occur during third trimester pregnancy up to two year post partum period.

4.8 Dissemination of results

The final report of this study will be presented to College of Health Sciences School of Public Health as partial fulfillment of Master's Degree in Public Health. It will be sent to Butajira mental health project office and to other concerned governmental and non-governmental organizations. It will also be disseminated through publication and presentation in scientific conferences and workshops.

5. Result

5.1 Socio Demographic Characteristics of Respondents

Out of the total 923 (126 exposed and 797 unexposed) women included in this study, 55 (43.7%) of exposed and 380 (47.7%) unexposed group were from Meskan ethnic group. Three fourth or 94 (74.6%) of the exposed and 623 (78.2%) of the unexposed were Muslims, while 22 (17.5%) of the exposed and 118 (14.8%) were Orthodox Christians. Majority of the exposed 109 (86.5) and the unexposed 682 (85.5%) population were living in rural areas. Ninety three (73.8%) of the exposed and 681 (85.4%) of unexposed were housewife and the rest were participating in the trading, farming and other jobs.

Almost half of the respondents, 60 (47.6%) exposed and 374 (46.9%) unexposed were with age group of 25- 34 years. All women were married and most of the married women both in exposed104 (83.9 %) and unexposed 648 (81.8%) were having monogamous marriage. Above two third 91 (72.2%) of exposed and 562(70.5) unexposed women were illiterate, 7 (5.6 %) of exposed and 81 (10.2%) unexposed can read and write, while the rest 28 (22.2%) of exposed and 154 (19.3%) unexposed joined formal education. Most husbands in both groups (exposed 115 (92.7%) and unexposed 771 (97.3%) were employed. Almost two third of the husbands (exposed 505 (63.8%) and unexposed (79 (63.7) were formally educated. Thirty eight (30.2%) of exposed and 308 (38.6%) of unexposed women reported that they cannot survive in the case of emergency. One fourth of the exposed 35 (27.8%) and 59 (7.4%) of unexposed women's family were hungry in the last month. Thirty seven (29.4%) of exposed and 200 (25.1%) of unexposed women were poor.

Table 1: Socio demographic Characteristics of postnatal women in Butajira, SNNP, Ethiopia, 2014

Variables	Exposed (Women with CMD) N(%)	Unexposed (women without CMD) N (%)	X^2 Value (df)	P value
Ethnicity				
Meskan	55 (43.7)	380 (47.7)	4.131	0.248
Mareko	14(11.1)	104 (13)	(3)	
Silite	28 (22.2)	187(23.5)		
Other	29(23)	126 (15.8)		
Religion				
Orthodox	22(17.5)	118 (14.8)	0.810	0.667
Muslim	94 (74.6)	623 (78.2)	(2)	
Catholic/ Protestant	10 (7.9)	56 (7.0)		
Residence				
Rural	109(86.5)	682 (85.6)	0.078	0.780
Urban	17 (13.5)	115 (14.4)	(1)	
Work				
Housewife	93 (73.8)	681 (85.4)	11.814	0.008
Trading & related	23 (18.3)	81(10.2)	(3)	
Farming	6 (4.8)	16 (2.0)		
other	4 (3.2)	19 (2.4)		
Maternal age				
15-24	38 (30.2)	317 (39.8)	8.592	0.014
25-34	60 (47.6)	374(46.9)	(2)	
35-49	28 (22.2)	106 (13.3)		
Marriage Consent				
Consented	87 (70.2)	662 (83.6)	12.961	0.0001
Non consented	37 (29.8)	130 (16.4)	(1)	
Type of marriage				
Monogamous	104 (83.9)	648 (81.8)	0.307	0.579
Polygamous	20 (16.1)	144 (18.2)	1	
Education				
Illiterate	91(72.2)	562(70.5)	2.931	0.231
Read and write	7 (5.6)	81 (10.2)	(2)	
Formal education	28 (22.2)	154(19.3)		
Husband unemployment				
No	115 (92.7)	771 (97.3)	7.182	0.007
Yes	9 (7.3)	21 (2.7)	(1)	
Husband education				
Formal education	505 (63.8)	79 (63.7)	0.001	0.977
Informal education	286 (36.2)	45 (36.3)	(1)	
Emergency				
Yes able to survive	38 (30.2)	308 (38.6)	3.344	0.067
Not able to survive	88 (69.8)	489 (61.4)	(1)	
Debt				0.0001
No	100(79.4)	749 (94.0)	31.501	
Yes	26 (20.6)	48 (6.0)	(1)	
Hungry				
No	91 (72.2)	738 (92.6)	49.379	0.0001
Yes	35 (27.8)	59 (7.4)	(1)	
Saving				
No	119 (94.4)	767 (96.2)	0.907	0.341
Yes	7 (5.6)	30 (3.8)	(1)	
Relative wealth				
The same or more	47 (37.3)	352 (44.2)	2.089	0.148
Less	79 (62.7)	445 (55.8)	(1)	
Poverty				
Non poor	89 (70.6)	597 (74.9)	1.040	0.308
Poor	37 (29.4)	200 (25.1)	(1)	

X^2 : chi square test, **Df:** degree of freedom, **CMD:** Common mental disorder, $P < 0.005$ = significant

5.2 Obstetric Factors of Study Participants

Above half, 69 (54.8%) of the exposed and 432 (54.2%) of unexposed women attended ANC, whereas about two third, 91 (72.2%) of the exposed and 466 (58.5%) of unexposed women have obstetric complication on current delivery. Sixteen (12.7 %) of exposed and 119 (14.9%) of unexposed women were premiparouse, 30 (23.8%) of exposed and 259 (32.5%) of unexposed women gave 1-2 birth and 45 (35.7%) of exposed and 222 (27.9%) of unexposed women were grand parouse, the remaining women were multiparouse giving 1-4 birth. One hundred two (81%) of exposed and 588 (73.8%) of unexposed women did not attend women group discussion during their pregnancy. Ninety-five (75.4%) of exposed women and 597 (74.9%) of unexposed women had no history of infant death. Normal vaginal delivery was predominant mode of delivery both in exposed 122 (96.8%) and unexposed 773 (97%) women. Forty-seven (37.3%) of exposed and 315 (39.5%) of unexposed birth were assisted by their neighbor, 40 (31.7%) of exposed and 238 (29.9%) of unexposed birth were assisted by relatives and 9 (7.1%) of exposed and 9 (7.1%) of unexposed birth were attended by trained traditional birth attendant. The remaining births were attended by midwife, doctor and other health workers. The total duration of labour lasts greater than 24 hour for about 94 (74.6%) exposed and 651 (81.7%) unexposed women. Seventy (55.6%) of the exposed and 399 (50.1%) of unexposed women's baby were boy. Out of the total births, 557 (60.3%) children were weighted at birth. Out of these, majority of the children, 77 (61.1 %) exposed and 437 (54.8 %) unexposed weighed greater than 2.5 kg.

Table 2: Obstetric factors and infant characteristics of postnatal women with CMD and without CMD in Butajira ,SNNP, Ethiopia 2014.

Variables	Exposed women with CMD N (%)	Unexposed women without CMD(%)	X^2 Value (df)	P value
Anc				
Yes	69 (54.8)	432 (54.2)	0.014	907
No	57 (45.2)	365 (45.8)	(1)	
Current obstetric complication				
No	35 (27.8)	331 (41.5)	8.600	0.003
Yes	91 (72.2)	466 (58.5)	(1)	
Parity				
Primparous	16 (12.7)	119 (14.9)	5.722	0.126
1-2	30 (23.8)	259 (32.5)	(3)	
3-4	35 (27.8)	197 (24.7)		
≥5	45 (35.7)	222 (27.9)		
Want				
Yes	53 (42.1)	431 (54.1)	6.297	0.012
No	73 (57.9)	366 (45.9)	(1)	
Duration of labor				
< 24 hour	94 (74.6)	651 (81.7)	3.502	0.061
>24 hour	32 (25.4)	146 (18.3)	(1)	
Mode of delivery				
Normal	122 (96.8)	773 (97)	894	0.982
Instrumental /operative	4 (3.2)	24 (3.0)	(1)	
Birth attendant				
None / relative	40 (31.7)	238 (29.9)	3.367	0.644
Neighbor	47 (37.3)	315 (39.5)	(5)	
Untrained TBA	12 (9.5)	46 (5.8)		
Trained TBA	14 (11.1)	106 (13.3)		
Midwife	9 (7.1)	59 (7.4)		
Doctor / other Hw	4 (3.2)	33 (4.1)		
Baby gender				
Boy	70 (55.6)	399 (50.1)	1.313	0.252
Girl	56 (44.4)	398 (49.9)	(1)	
Birth weight				
>2.5 kg	77 (61.1)	437 (54.8)	2.492	0.288
< 2.5kg	7 (5.6)	36 (4.5)	(2)	
No BWT	42 (33.3)	324 (40.7)		

X^2 : chi square test, **Df:** degree of freedom, **CMD:** Common mental disorder P < 0.005 = significant

5.3 Infant Feeding Practice of Women

Of the total respondents, only 43 (4.7%) of children were given prelacteal feeds. Prelacteal feeding was more common among women with CMD (7.9%) than women without CMD (4.1%). One hundred eight (85.7%) of exposed and 640 (80.3%) of unexposed women gave colostrums to their child. Except one third of the exposed and 249 (31.2 %) of unexposed women who initiated breast feeding within the first one hour after giving birth, most of the women 499 (62.6%) of exposed and 62 (49.2 %) of unexposed initiated breast feeding within 1- 8 hour. With regard to duration of breast feeding, all women were breast feeding up to two months and only 16 women 3(2.4%) from exposed and 13 (1.6%) from unexposed group discontinue breast feeding before 12 month. Majority of the respondents, 109 (86.5%) of the exposed and 735 (92.2%) unexposed women breast fed their child on demand in the previous night at 2 month. Most women with CMD were breast feeding less frequently than women without CMD both at night and day time in the previous day. The mean and median duration of breast feeding was 22.3 and 24 month, respectively. Only one third of the total respondents discontinue breast feeding before 2 year, among these discontinued nearly all, 755 (94.7%) and 118 (93.7%) women ceased breast feeding between 18 – 24 month in exposed and unexposed group, respectively. Only 5 women discontinue before 6 month while 2 (1.6%) and 9 (1.1%) of unexposed discontinue before one year.

Despite the small number, 53 (5.7 %) of the total respondents who gave plain water, it was more common among women with CMD (9.5%) than women without CMD (5.1%). Nineteen (15.1%) of exposed and 107 (84.9%) of women were predominantly breast feeding. There were only three women who complained as having feeding problem at two month. But, this number increased to 69 at 12 month postpartum period. Of these participants, higher proportion was from those with CMD, 15 (11.5%). Three women (2.4%) of exposed and 23 (2.9%) of unexposed women gave other milk (other than breast milk) at two month. Of the total 923 respondents, 20 of them (2.2%) started giving soup and only two women gave formula at 2 month. Formula feeding is more common among unexposed women than exposed women both at 2 month and 12 month postpartum period. Only 1 (0.8%) of exposed and 13 (1.6%) of unexposed women fed formula at 12 month.

Table 3: Infant feeding practice of women in Butajira, SNNP, Ethiopia 2014

Variables	Exposed women with CMD N (%)	Unexposed women without CMD(%)	X^2 Value (df)	P value
Prelacteal feeding				
No	116(92.1)	764 (95.9)	3.530	0.060
Yes	10 (7.9)	33(4.1)	(1)	
Colostrum				
No	18 (14.3)	157 (19.7)	2.075	0.150
Yes	108 (85.7)	640 (80.3)	(1)	
Breast initiation				
with in 1 hour	49 (38.9)	249 (31.2)	11.613	0.009
1-8 hour	62(49.2)	499 (62.6)	(3)	
8-24 hour	11 (8.7)	41 (5.1)		
>24 hour	4 (3.2)	8(1.0)		
Frequency of breast feeding previous night				
On demand	109 (86.5)	735 (92.2)	4.537	0.033
Less frequent	17 (13.5)	62(7.8)	(1)	
Frequency of breast feeding previous day				
On demand	112 (88.9)	735 (92.2)	1.599	0.206
Less frequent	14 (11.1)	62 (7.8)	(1)	
Exclusive breast feeding 2 month				
Yes	101 (80.2)	675 (84.7)	1,670	0.196
No	25 (19.8)	122 (15.3)	(1)	
Predominent breast feeding 2 month				
No	107 (84.9)	709 (89.0)	1.472	0.154
Yes	19 (15.1)	88 (11.0)	(1)	
Plain water 2 month				
No	114 (90.5)	756 (94.9)	1.531	0.435
Yes	12 (9.5)	41 (5.1)	(1)	
Fed formula at 2 month				
No	126 (100.0)	795 (99.7)	0.317	0.573
Yes	0 (0)	2 (0.3)	(1)	
Fed non breast milk				
No	123 (97.6)	774 (97.1)	0.101	0.750
Yes	3(2.4)	23 (2.9)	(1)	
Diarrhea and breast feeding at 2 month				
Increased				
Decreased	1 (2.3)	4 (2.1)	0.052	0.974
The same	16 (36.4)	74 (38.1)	(1)	
	27 (61.4)	116 (59.8)		
Breast feeding at 12 month				
Yes	123 (97.6)	784 (98.4)	0.635	0.425
No	3 (2.4)	13 (1.6)	(1)	
Breast feeding at 2 year				
Yes	88 (69.8)	524 (65.7)	0.817	0.366
No	38 (30.2)	273 (34.3)	1	
Feeding problem at 12 month				
No	111(88.1)	743 (93.2)	4.139	0.042
Yes	15 (11.9)	54 (6.8)	1	
Feeding problem at 2 month				
No	125 (99.2)	795 (99.7)	0.989	0.320
Yes	1 (0.8)	2 (0.3)	1	

X^2 : chi square test, **Df:** degree of freedom, **CMD:** Common mental disorder, P < 0.005 = significant

5.4 Maternal and infant illness

Twenty four (19.0%) of exposed and 90 (11.3%) of unexposed mothers complained that they were having breast pain since they gave birth. Slightly higher proportion (55.6%) of children of mothers with CMD ever been ill than children of mothers with-out CMD (46.3%). Eighty two (65.10%) of exposed and 327 (41.0%) of exposed women been ill since they gave birth.

Table 4: Maternal and infant illness in Butajira , SNNRP, Ethiopia , 2014

Variables	Exposed women with CMD N (%)	Unexposed women without CMD N (%)	X^2 Value (df)	P value
Breast pain 2 Month				0.014
No	102 (81.0)	707 (88.7)	6.045	
Yes	24 (19.0)	90 (11.3)	(1)	
Baby illness				
Never ill	56 (44.4)	428 (53.7)	3.738	0.053
Baby ill	70 (55.6)	369 (46.3)	(1)	
Maternal illness since birth				
No	44 (34.9)	470 (59.0)	25.503	0.0001
Yes	82 (65.10	327 (41.0)	(1)	
CMD at 12 month				
No	98 (77.8)	764(95.9)	57.633	0.0001
Yes	28 (22.2)	33(4.1)	(1)	

X^2 : chi square test, **Df:** degree of freedom, **CMD:** Common mental disorder, P < 0.005 = significant

5.5 Maternal mental illness

Among the total 1006 women included in this analysis, 119 (11.8%) of the women had CMD indicated by SRQ (SRQ > 6) during the antenatal period. After excluding all deaths between birth up to 2 year, the prevalence of CMD out of 923 women was 41 (4.4%) at 2 month postpartum. Among these women 18 (2%) were new cases (incidence CMD) at 2 month and the remaining 23 (2.5%) of them had persistent CMD (CMD both at pregnancy and 2 month postpartum). The prevalence of CMD was 61 (6.6%) at 12 month post partum.. Among these 33 (3.6%) of them were new cases and 12 (1.3%) had persistent CMD at pregnancy, 2 month and 12 month postpartum, 6 (0.7%) of them had persistent CMD at 2 and 12 month and the remaining 10 (1.1%) women were having CMD at third trimester pregnancy and 12 month.

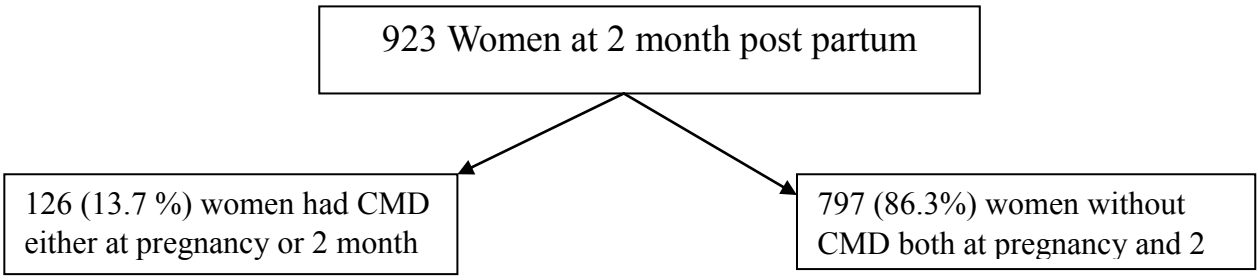

Figure 2: Number of exposed and unexposed women at 2 month (For assessment of discontinuation of breast feeding, first objective)

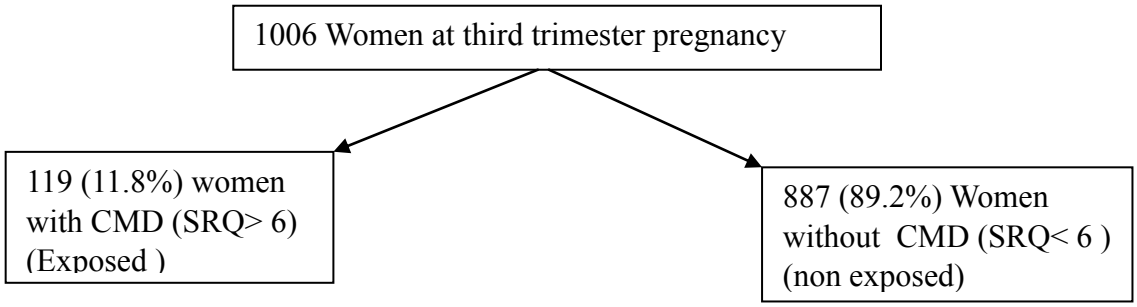

Figure 3: Number of exposed and unexposed women by CMD at third trimester pregnancy. (For assessment of prelacteal feeding, second objective)

5.6 Time to discontinuation of breast feeding 0-24 month

A total of 923 women (126 women with CMD and 797 women with-out CMD) were followed for median time of 24 month starting from birth up to 2 year. There is no lost to follow up and since all death between these time interval were excluded, 923 women were followed for 20586.82 total analysis time. Among these 126 women with CMD were contributing for 17768.3 person time and 797 women with-out CMD were followed for 2818.52 person time. Among all 923 women, 311 (33.7%) women discontinue breastfeeding before 2 year. From these 38 (30.2%) and 273 (34.3%) of the women were from exposed and unexposed group respectively. The remaining 524 (65.7%) of women with-out CMD and 88 (69.8%) of women with CMD were censored during the follow up time. The overall incidence of discontinuation of breast feeding was 15.107, 95% CI (13.52, 16.88). It was 13.48 per 1000 person time, 95% CI (9.81, 18.23) among exposed and 15.36 per 1000 person time 95% CI (13.64, 17.29). The minimum follow up time was 4 and 2 (measured in month) for women with CMD and women without CMD respectively and the maximum was 23 month for both women with CMD and without CMD. Most common time that majority of the respondents both from exposed and unexposed group discontinue breast feeding was at 18 month 92 (29.58%) and 22 month was also the second most common time that large proportion of women both with CMD and without CMD discontinued breast feeding . Above three fourth of 78.9% of women with CMD and 231 (74.43%) women with out CMD discontinue between 18 -23 month. The overall mean duration of breast feeding among unexposed and exposed was 22.294 and 22.3969 respectively.

5.7 Association between perinatal CMD and discontinuation of breast feeding

Bivariate cox regression was done to assess the association between CMD and discontinuation of breast feeding and for all possible confounding factors. Table 5.8 indicates bivariate cox regression using crude HR (95% CI). Ethnicity, religion and maternal age were significant socioeconomic factors for discontinuation of breast feeding. As compared to meskan ethnic group, the risk of discontinuation of breast feeding was increased by 67.6% and 41.9% for Mareko and Silete women respectively; CHR= 1. 676, 95% CI: [1.224-2.294] and CHR = 1.41, 95% CI: [1.084-1.859]. Catholics and protestant religion followers were two times more likely to discontinue breast feeding as compared to Orthodox religion followers; CHR = 2.018 , 95% CI: [1.223-3.327] and the risk was also 52.5% higher among Muslims ; CHR = 1.525 , 95% CI: [1.066-2.183]. Younger mothers were at higher risk to discontinue breast feeding than older ones. Those women who were in 25-34 age category were 33.9.1% less likely to discontinue breast feeding compared to the youngest age category(15-24 years) ; CHR = 0.661 , 95% CI: [0.523-0.834]. The risk also decreased by 58.1% among women whose age is between 35-49 years. Although, education didn't reveal any significant association it's category compared to the reference category, the omnibuis test of model coefficient suggested as having significant (0.027) association with discontinuation of breast feeding.

Among obstetric factors, having any history obstetric complications on current delivery and parity were found to have significant association with discontinuation of breast feeding. As compared to primiparouse mothers, multiparouse women were less likely to discontinue breast feeding and the risk significantly reduced by 51.5%, 49.6% and 60.8% among those women who gave 1-2 birth, 3-4 birth and among grand parouse women respectively; CHR = 0.495 , 95% CI: [0.365-0.671], CHR = 0.504 , 95% CI: [0.366-0.694] and CHR = 0.392 , 95% CI: [0.283-0.544]. Any obstetric complication on current delivery increases the risk of discontinuation of breast feeding by 39.55%; CHR = 1.395, 95% CI: [1. 102-1.766]. Those women whose children weighed < 2.5 kg at birth were 45.9% less likely to discontinue breast feeding as compared to those with normal birth weight; CHR = 0.459 , 95% CI: [0.226-0.932]

No statistically significant association was found between discontinuation of breast feeding and maternal CMD; CHR = 0.865, 95% CI: [0.616-1.214].

Table 5: Association between socio demographic factors and discontinuation of breast feeding among postnatal women in Butajira, SNNP Ethiopia, 2014

Variables	Number at risk	Number discontinued	Person time	Incidence of discontinuation of breast feeding per 1000 person (95% CI)	Crude HR (95% CI)
Ethnicity					
Meskan	435	134	9812.69	13.66 (11.53, 16.18)	1
Mareko	118	55	2529.83	21.74 (16.69, 28.32)	**1.68 (1.22, 2.29)***
Silite	215	87	4706.65	18.48 (14.98, 22.81)	**1.42 (1.08, 1.86)***
Other	155	35	3537.65	9.89 (7.10, 13. 78)	0.70 (0.49, 1.02)
Religion					
Orthodox	140	34	3200.04	10.62 (7.59, 14.87)	1
Muslim	717	249	15979.26	15.58 (13.76, 17.64)	**1.53 (1.07, 2.18)***
Catholic/ Protestant	66	28	1407.52	19.89 (13.74, 28.81)	**2.02 (1.22, 3.33)***
Residence					
Rural	791	268	17637.74	15.19 (13.48, 17.13)	1
Urban	132	43	2949.09	14.58 (10.81, 19.66)	0.93 (0.67,1.28)
Work					
Housewife	774	265	17299.78	15.32 (13.58, 17.28)	1
Trading & related	104	34	2304.13	14.75 (10.54, 20.65)	0.95 (0.67, 1.36)
Farming	22	4	503	7.95 (2.98, 21.18)	0.51 (0.19, 1.36)
Other	23	8	479.913	16.67 (8.34, 33.33)	1.08 (0.53, 2.18)
Maternal age					
15-24	355	153	7818.21	19.57 (16.70, 22.93)	1
25-34	434	131	9719.78	13.48 (11.36, 15.99)	**0.66 (0.53, 0.83)***
35-49	134	27	3048.83	8.86 (6.07, 12.91)	**0.42 (0.28, 0.63)***
Marriage Consent					
Yes	749	254	16680.78	15.23 (13.47, 17.22)	1
No	167	55	3745.74	14.68(11.27,19.12)	0.96 (0.72, 1.28)
Type of marriage					
Monogamous	752	248	16837.47	14.73 (13.01,16.68)	1
Polygamous	164	61	3589.04	16.99 (13.22, 21.84)	1.18 (0.89, 1.56)
Education					
Illiterate	653	215	14550.52	14.78 (12.93, 16.89)	1
Read and write	88	21	2005.91	10.47 (6.83, 16.06	0.69 (0.44, 1.08)
Formal education	182	75	4030.39	18.61 (14.84, 23.3)	1.27 (0.98, 1.66)
Husband education					
Formal education	584	199	12926.432	15.39 (13.39, 17.69)	1
No formal education	332	110	7476.085	14.71 (12.21, 17.74)	0.94(0.74, 1.19)
Husband unemployment					
No	886	303	19746.91	15.34 (13.71, 17.17)	1
Yes	30	6	679.61	8.83 (3.97,19.65)	0.55 (0.25, 1.23)
Emergency					
Yes able to survive	346	113	7757.48	14.57 (12.11, 17.52)	1
Not able to survive	577	198	12829.34	15.43 (13.43, 17.74)	1.08 (0.85, 1.36)
Debt					
No	849	285	18930.91	15.05 (13.40, 16.91)	1
Yes	74	26	1655.91	15.70 (10.69, 23.06)	1.04 (0.69, 1.55)
Hungry					
No	829	279	18488.61	15.09 (13.42, 16.97)	1
Yes	94	32	2098.22	15.25 (10.79, 21.57)	1.01(0.70, 1.46)
Relative wealth					
The same or more	399	136	8793.78	15.47 (13.07, 18.29)	1
Less	524	175	11793.04	14.84 12.79, 17.21)	0.95 (0.76, 1.19)
Poverty					
Non poor	686	221	15350.26	14.39 (12.62, 16.43)	1
Poor	237	90	5236.56	17.19 (13.98, 21.13)	1.22 (0.95, 1.56)

CI: confidence interval, **Crude HR:** Hazard Ratio, **Adjusted HR:** Adjusted Hazard Ratio, **CMD:** Common Mental Disorder. * Statistically significant

Table 6: Association between obstetric factors and discontinuation of breast feeding among postnatal women in Butajira , SNNP, Ethiopia, 2014

Variables	Number at risk	Number discontinued	Person time	Incidence of discontinuation of breast feeding per 1000 (95% CI)	Crude HR (95% CI)
ANC					
Yes	501	175	11162.74	15.68 (13.52, 18.18)	1
No	422	136	9424.09	14.43 (12.19, 17.07)	0.91(0.73, 1.14)
Current obstetric complication					
No	366	104	8294.09	12.54 (10.35, 15.19)	1
Yes	557	207	12292.736	16.84 (14.69, 19.29)	**1.39 (1.10, 1.77)***
Parity					
Primparous	135	76	2889.7807	26.29 (21.00, 32.93)	1
1-2	289	92	6521.0425	14.11 (11.50, 17.31)	**0.49 (0.37, 0.67)***
3-4	232	75	5197.2595	14.43 (11.51, 18.09)	**0.50 (0.37, 0.69)***
≥5	267	68	5978.7382	11.37 (8.97, 14.43)	**0.39 (0.28, 0.54)***
Want					
Yes	484	171	10805.22	15.83 (13.62, 18.38)	1
No	439	140	9781.61	14.31(12.13, 16.89)	0.89 (0.72, 1.12)
Duration of labor					
< 24 hour	745	245	16619.56	14.74 (13.01, 16.71)	1
>24 hour	178	66	3967.26	16.64 (13.07, 21.18)	1.13 (0.86, 1.48)
Mode of delivery					
Normal	10	299	19939.60	14.99 (13.39, 16.79)	
Instrumental /operative	885	12	647.22	18.54 (10.53, 32.65)	1 1.28 (0.72, 2.28)
Birth attendant	278				
None /relative	362	105	6140.04	17.10 (14.12, 20.71)	1
Neighbor	58	113	8141.69	13.88 (11.54, 16.69)	0.78 (0.60, 1.02)
Untrained TBA	120	21	1282.91	16.37 (10.67, 25.11)	0.93 (0.59, 1.49)
Trained TBA	68	39	2648.83	14.72 (10.76, 20.15)	0.85 (0.59, 1.22)
Midwife	37	19	1546.13	12.29 (7.84, 19.27)	0.68 (0.41, 1.10)
Doctor / other		14	827.22	16.92 (10.02, 28.58)	0.97 (0.55, 1.69)
Baby gender					
Boy	469	152	10549.12	14.41 (12.29, 16.89)	1
Girl	454	159	10037.69	15.84 (13.56, 18.50)	1.11 (0.89, 1.39)
Birth weight					
Normal BWT	514	186	11346.39	16.39 (14.19, 18.93)	1
Low BWT	43	8	1001.30	7.98 (3.99, 15.98)	0.46 (0.23, 0.93)
No BWT	366	117	8239.13	14.20 (11.85, 17.02)	0.84 (0.67, 1.06)

CI: confidence interval, **Crude HR:** Hazard Ratio, **Adjusted HR:** Adjusted Hazard Ratio, **CMD:** Common Mental Disorder. * Statistically significant

Table 7: Bivariate cox regression analysis for association between maternal and infant illness with discontinuation of breast feeding among postnatal women in Butajira, Ethiopia, 2014

Variables	Number at risk	Number discontinued	Person time	Incidence of discontinuation of breast feeding by 1000 (95%)	Crude HR (CI 95%)
Breast pain 2 Month					
No	809	265	18109.99	14.63 (12.97, 16.51)	1
Yes	114	46	2476.83	18.57 (13.91, 24.79)	1.32 (0.96, 1.80)
Baby illness					
Never ill	484	158	10757.52	14.68 (12.57, 17.17)	1
Baby ill	439	153	9829.30	15.56 (13.28, 18.24)	1.07 (0.86, 1.34)
Maternal illness since birth					
No	514	172	11546.74	14.89 (12.83,17.29)	1
Yes	409	139	9040.09	15.38 (13.02, 18.16)	1.05 (0.84, 1.31)
Feeding problem at 12 month					
No	854	284	19060.3	14.90 (13.26, 16.74)	1
Yes	69	27	1526.52	17.69 (12.13, 25.79)	1.21 (0.82 ,1.80)
CMD atleast once					
Non cases	797	273	17768.3	15.36 (13.65, 17.29)	1
Cases (CMD)	126	38	2818.52	13.48 (9.81, 18.53)	0.87 (0.62, 1.21)
CMD at 12 month					
Non cases	815	292	19254.51	15.16 (13.52, 17.01)	1
Cases	108	19	1332.30	14.26 (9.09, 22.36)	0.94 (0.59, 1.50)

CI: confidence interval, **Crude HR:** Hazard Ratio, **Adjusted HR:** Adjusted Hazard Ratio, **CMD:** Common Mental Disorder. * Statistically significant

Multivariate Cox proportional hazard regression

In the multivariate Cox proportional hazard model, ethnicity, religion, maternal age, education, obstetric complication, parity, birth weight and the exposure variable (maternal CMD) were included in the model. Among these variables ethnicity, maternal age, education, parity and BWT were statistically significant predictors of discontinuation of breast feeding before two year. The risk of discontinuation of breast feeding increased by 50.9% and 45.2 % among women from Mareko and Silete ethnicity; AHR = 1.509, 95% CI: [1.049- 2.170] and AHR = 1.452, 95% CI: [1.104- 1.908] respectively. Mothers who were between 35-49 years were 51.0% less likely to discontinue breast feeding as compared to youngest mothers whose age is between 15-24 years.

Mothers who had obstetric complication were 35% more likely to discontinue than those who has no obstetric complication on the current delivery; AHR =1.350, 95% CI: [1.061, 0.718]. Parity is also one of the significant factors for discontinuation of breast feeding. The risk of discontinuation of breast feeding reduced almost by half (42.8%) among Grandparouse mothers than primiparouse; AHR =0.572, 95% CI: [0.351, 0.935].

Those women whose children weighed < 2.5 kg at birth were 40% less likely to discontinue breast feeding as compared to those mothers whose children delivered with normal birth weight; AHR = 0.401, 95% CI: [0.196- 0.819].

These are important factors found to have statistically significant association with discontinuation of breast feeding. However there is no statistically significant association between perinatal CMD and discontinuation of breast feeding after controlling confounders; AHR = 0.915, 95% CI: [0.647- 1.291].

Table 8: Multivariate cox regression model for discontinuation of breast feeding among postnatal women in Butajira , SNNP, Ethiopia, 2014

Variables	Exposed (Women with CMD) N(%)	Unexposed (women without CMD) N (%)	Crude HR (95% CI)	Adjusted HR (95% CI)
Ethnicity				
Meskan	55 (43.7)	380 (47.7)	1	**1**
Mareko	14(11.1)	104 (13)	**1.68 (1.22, 2.29)**	**1.51 (1.05, 2.17)***
Silite	28 (22.2)	187(23.5)	**1.42 (1.08, 1.86)**	**1.45 (1.10, 1.91)***
Other	29(23)	126 (15.8)	0.70 (0.49, 1.02)	0.83 (0.53, 1.29)
Religion				
Orthodox	22(17.5)	118 (14.8)	1	1
Muslim	94 (74.6)	623 (78.2)	**1.53 (1.07, 2.18)**	1.31 (0.86, 2.02)
Catholic/ Protestant	10 (7.9)	56 (7.0)	**2.02 (1.22, 3.33)**	1.65 (0.96, 2.84)
Maternal age				
15-24	38 (30.2)	317 (39.8)	1	1
25-34	60 (47.6)	374(46.9)	**0.66 (0.52, 0.83)**	0.79 (0.55, 1.11)
35-49	28 (22.2)	106 (13.3)	**0.42 (0.28, 0.63)**	**0.49 (0.28, 0.86)***
Education				
Illiterate	91(72.2)	562(70.5)	1	1
Read and write	7 (5.6)	81 (10.2)	0.69 (0.44, 1.08)	0.86 (0.54, 1.35)
Formal education	28 (22.2)	154(19.3)	1.27 (0.98, 1.66)	1.31 (0.99, 1.73)
Current obstetric complication				
No	35 (27.8)	331 (41.5)	1	**1**
Yes	91 (72.2)	466 (58.5)	**1.39 (1.10, 1.77)**	**1.35 (1.06, 1.72)***
Parity				
Primparous	16 (12.7)	119 (14.9)	1	**1**
1-2	30 (23.8)	259 (32.5)	**0.49 (0.37-0.67)**	**0.53 (0.39, 0.73)***
3-4	35 (27.8)	197 (24.7)	**0.50 (0.37, 0.69)**	0.66 (0.44, 1.01)
≥5	45 (35.7)	222 (27.9)	**0.39 (0.28, 0.54)**	**0.57 (0.35, 0.94)***
Birth weight				
Normal BWT	77(61.1)	437 (54.8)	**1**	**1**
Low BWT	7 (5.6)	36 (4.5)	**0.46 (0.23, 0.93)**	**0.40 (0.19, 0.82)***
No BWT	42 (33.3)	324 (40.7)	0.84 (0.67, 1.06)	0.87 (0.68, 1.11)
CMD at least once				
No	514(85.6)	273(87.8)	1	1
Yes	88(14.4)	38(12.2)	0.87 (0.62, 1.21)	0.91 (0.65, 1.29)

CI: confidence interval, **Crude HR:** Hazard Ratio, **Adjusted HR:** Adjusted Hazard Ratio, **CMD:** Common Mental Disorder. * Statistically significant

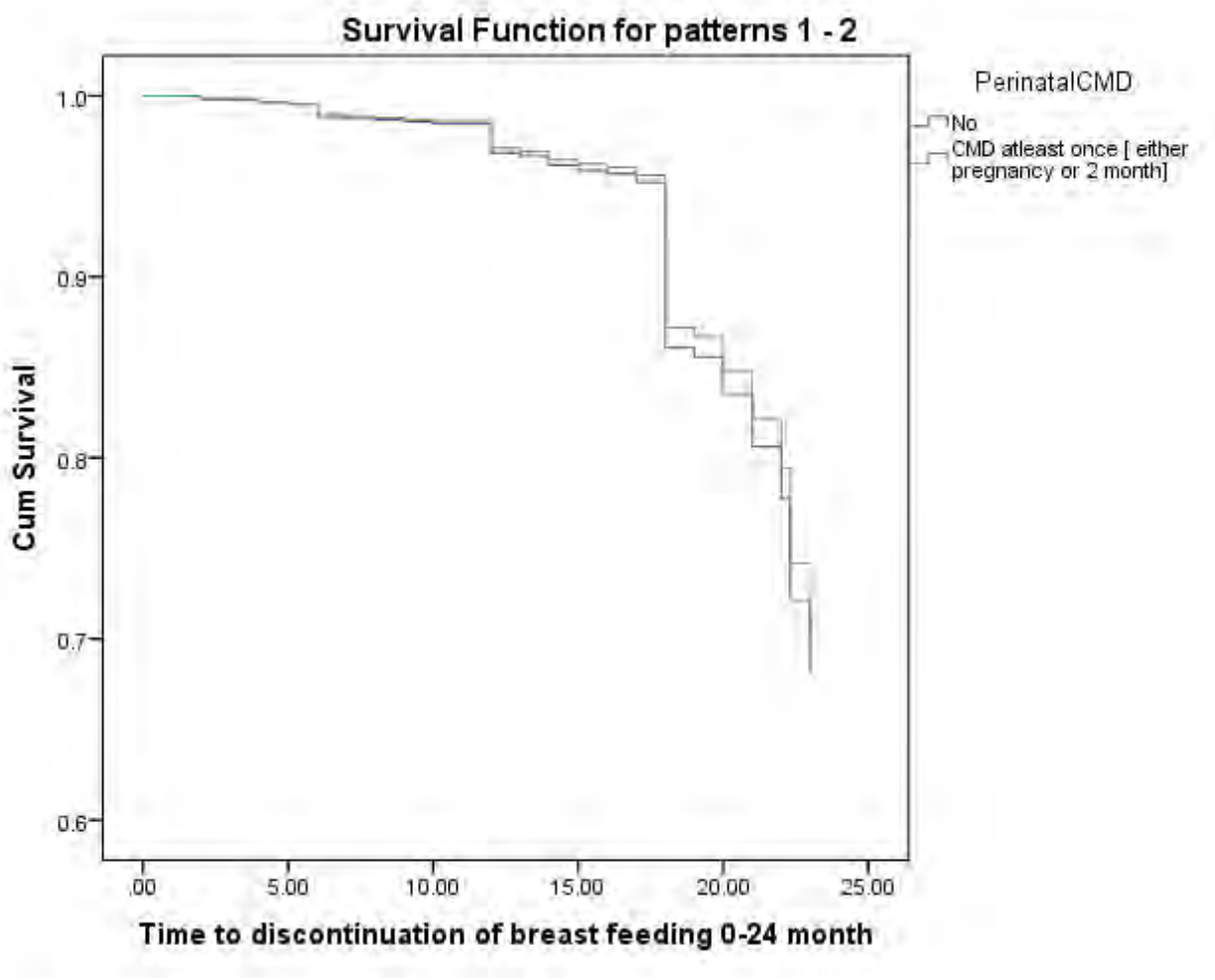

Figure 4: Survival curve of discontinuation of breast feeding among women with CMD and without CMD from birth up to 24 month in Butajira,SNNP Ethiopia 2014

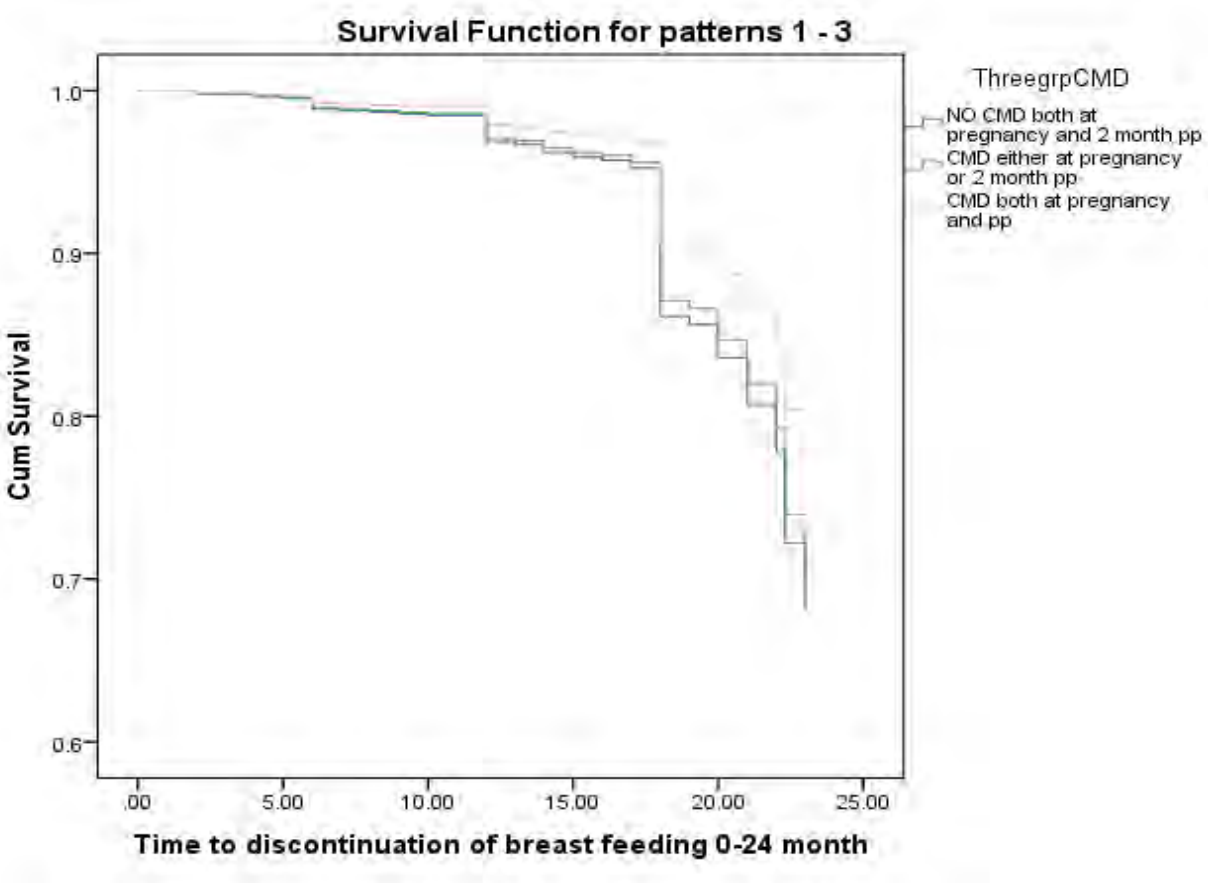

Figure 5: Survival curve of discontinuation of breast feeding among women with CMD and without CMD from birth up to 24 month in Butajira, Ethiopia 2014

5.8 Prelacteal feeding

Bivariate analysis

Bivariate Poisson regression was done to assess the impact of antenatal CMD on prelacteal feeding practice. Socio demographic factors like residence and relative wealth were significantly associated with prelacteal feeding. The risk of prelacteal feeding was three times higher among mothers who live in Urban areas than rural residents,(crude IRR = 3.346, 95% CI 1.884,5.942). Those women who reported that their wealth was less than their relatives were two times more likely to give prelacteal feeds to their child,(crude IRR = 2.208, 95% CI 1.176,4.146). Prelacteal feeding was three times more common among mother who gave birth through instrumental or operative (CS) than those who gave birth through normal vaginal delivery,(crude IRR = 3.662, 95% CI 1.455,9.216). CMD was statistically significant factor for prelacteal feeding. women with CMD at their third trimester pregnancy were two times more likely to give prelacteal feeds to their children than women without CMD,(crude IRR = 2.049 95% CI 1.051,3.994)

Table 9: Bivariate and multivariate poission regression analysis for association between socio demographic factors and prelacteal feeding among postnatal women in Butajira, Ethiopia, 2014

Variables	Exposed With CMD	Unexposed Without CMD	Crude IRR (95% CI)	Adjusted IRR (95% CI)
Ethnicity				
Meskan	52 (34.7)	412(46.4)	1	
Mareko	15(12.6)	118 (13.3)	0.54 (0.19, 1.54)	
Silite	25 (21.0)	214 (24.1)	0.75 (0.36, 1.55)	
Other	27 (22.7)	143 (16.1)	1.16 (0.57, 2.34)	
Religion				
Orthodox	23 (19.3)	129 (14.5)	1	
Muslim	88 (73.9)	696 (78.5)	1.39 (0.59, 3.26)	
Catholic and Protestant	8 (6.7)	62 (7.0)	0.72 (0.15, 3.59)	
Residence				
Rural	103 (86.6)	762 (85.9)	1	1
Urban	16 (13.4)	125 (14.1)	**3.35 (1.88, 5.94)**	**3.89 (2.02, 7.48)***
Work				
Trading & related	21 (17.6)	90 (10.1)	1	
Housewife	88 (73.9)	757 (85.3)	1.13 (0.45, 2.85)	
Farming and other	10 (8.4)	40 (4.5)	1.33 (0.32, 5.57)	
Maternal age				
15-24	40 (33.6)	349 (39.3)	1	
25-34	52 (42.9)	419 (47.2)	1.10 (0.59, 2.03)	
35-49	28 (23.5)	119 (13.4)	1.32 (0.59, 2.95)	
Marriage Consent				
Consented	84 (71.8)	731 (82.9)	1	
Not consented	33 (28.2)	151 (17.1)	0.71 (0.32, 1.56)	
Type of marriage				
Monogamous	99 (83.2)	713 (80.4)	1	
Polygamous	18 (15.1)	169 (19.1)	1.19 (0.61, 2.33)	
Education				
Illiterate	86 (72.3)	620 (69.9)	1	
Read and write	9 (7.6)	92 (10.4)	0.94 (0.37, 2.40)	
Formal education	24(20.2)	175 (19.7)	0.86 (0.42, 1.78)	
Husband education				
Formal	74 (63.2)	556 (63.1)	1	
Informal	43 (36.8)	325 (36.9)	1.199 (0.69, 2.09)	
Emergency				
able to survive	40 (33.6)	401 (45.2)	1	
Not able to survive	79 (66.4)	486 (54.8)	0.95 (0.55, 1.65)	
Debt				
No	91 (76.5)	834 (94.0)	1	
Yes	28 (23.5)	53 (6.0)	1.52 (0.65, 3.57)	
Hungry last month				
No	75 (63.0)	773 (87.1)	1	
Yes	44 (37.0)	114 (12.9)	1.15 (0.56, 2.36)	
Saving				
Yes	7 (5.90	33 (3.7)	1	
No	112 (94.1)	854 (96.3)	0.66 (0.21, 2.13)	
Relative wealth				
Same or more	47 (39.5)	386 (43.5)	**1**	1
Less wealth	72 (60.5)	501 (56.5)	**2.21 (1.18, 4.15)**	1.83 (0.96, 3.46)
Poverty				
Non poor	81 (68.1)	667 (75.2)	1	1
Poor	38 (31.9)	220 (24.8)	1.45 (0.81, 2.59)	1.27 (0.69, 2.29)

CI: confidence interval, **Crude IRR:** Incidence Rate Ratio, **Adjusted IRR:** Adjusted incidence Rate Ratio, **CMD:** Common Mental Disorder. * Statistically significa

Multivariate Poisson analysis

Possion regression model including residence, relative wealth, mode of delivery, antenatal CMD, poverty birth attendant and duration of lab our, showed that prelacteal feeding was three times more common in urban than rural areas, ,(adjusted IRR = 3.35, 95% CI 1.88,5.94). those women who gave birth through instrumental or operative (CS) were four times more likely to give prelacteal feeds to their child as compared to those who gave birth through normal delivery,(adjusted IRR = 4.21, 95% CI 1.19 ,14.86). Children whose mothers were assisted by doctors and other health professional were least likely 68.3% to fed prelacteal feeds; (adjusted IRR= 0.32, 95% CI 0.10,0.99). Prelacteal feeding has no significant association with relative wealth, poverty and duration of labour. However ,there is statistically significant association between prelacteal feeding and maternal antenatal CMD. Mothers with antental CMD were almost two times more likely to give prelacteal feeds to their child as compared to mothers without antenatal CMD after controlling socio demographic factors and other confounders,(adjusted IRR = 1.973 , 95% CI 1.009,3.854).

Table 10: Association between obstetric factors with prelacteal feeding among postnatal women in Butajira, SNNP, Ethiopia , 2014

Variables	With CMD	With out CMD	Crude IRR (95% CI)	Adjusted HR (95%CI)
ANC				
Yes	67 (56.3)	477 (53.8)	1	
No	52 (43.7)	410 (46.2)	0.76 (0.43, 1.33)	
History of Obstetric comp				
No	32 (26.9)	330 (37.2)	1	
Yes	87 (73.1)	557 (62.8)	1.23 (0.68, 2.22)	
Current obstetric complication				
No	35 (29.4)	364 (41.0)	1	
Yes	84 (70.6)	523 (59.0)	1.21 (0.68, 2.14)	
Parity				
Primparous	16 (13.4)	135 (15.2)	1	
1-2	32 (26.9)	282 (31.8)	0.66 (0.30, 1.43)	
3-4	26 (21.8)	223 (25.1)	0.49 (0.21, 1.19)	
≥5	45 (37.8)	247 (27.8)	0.75 (0.35, 1.62)	
Duration of labor				
< 24 hour	88 (73.9)	716 (81.4)	1	1
>24 hour	31 (26.1)	164 (18.6)	1.41 (0.75, 2.64)	1.40 (0.73, 2.70)
Mode of delivery				
Normal	115 (96.6)	862 (97.2)	**1**	**1**
Instrumental / operative	4 (3.4)	25 (2.8)	**3.66 (1.46, 9.22)**	**4.22 (1.19, 14.86)***
Birth attendant				
None / relative	35 (29.4)	264 (30.0)	1	1
Neighbor	48 (40.3)	358 (40.6)	0.62 (0.32, 1.21)	0.58 (0.29, 1.14)
Trained / Untrained TBA	23 (19.3)	166 (18.7)	0.59 (0.25, 1.39)	0.41 (0.17, 1.02)
Doctor, midwife & other HW	13 (10.9)	95 (10.3)	1.32 (0.59, 2.92)	**0.32 (0.10, 0.99)***
Baby gender				
Male	65 (54.6)	450 (50.7)	1	
Female	54 (45.4)	437 (49.3)	0.99 (0.99, 1.00)	
BWT				
Normal BWT	76 (63.9)	529 (59.6)	1	
Low BWT	7 (5.9)	41(4.6)	1.58 (0.47, 5.23)	
No BWT	36 (30.3)	317 (35.7)	1.71 (0.97, 5.23)	
Chat				
No	82(68.9)	645 (72.2)	1	
Yes	37 (31.1)	242 (27.3)	0.89 (0.47,1.67)	
Drink alcohol				
Never drinks	93 (78.2)	767(86.5)	`1	
Ever drinks	26 (21.8)	120 (13.5)	0.79 (0.34,1.84)	
Maternal illness in the past 12 month				
No	71 (59.7)	791 (89.2)	1	
Yes	48 (40.3)	96 (10.8)	1.28 (0.62, 2.64)	
CMD at antenatal period				
No CMD			**1**	**1**
CMD			**2.05 (1.05, 3.99)**	**1.97 (1.01, 3.85)***

CI: confidence interval, **Crude IRR:** Incidence Rate Ratio, **Adjusted IRR:** Adjusted incidence Rate Ratio, **CMD:** Common Mental Disorder. * Statistically significant

6. Discussion

In our study, no statistically significant association was found between maternal perinatal CMD and discontinuation of breast feeding before two year. This finding is consistent with studies done in Turkey (13) and USA (30) which found no significant relationship between CMD and discontinuation of breast feeding. Similarly, a hospital based comparative cross sectional study conducted on 1200 Chinese women in Hong Kong found no significant association between postnatal depressive symptom and breast feeding practice (29). Other case control study also could not find statistically significant association between maternal mental disorder at four month and early termination of breast feeding in Brazil (31).

In contrast, other study done in Nigeria found that depressed mothers were more likely to stop breast feeding earlier than non-depressed women (17). This variation might probably occur as they were closely measuring the outcome three times. The other possible reason could be the fact that they were following them for only nine months. In our study, however, we were following for 2 year which might be the possible reason for hiding the difference between the women with CMD and without CMD that resulted in weak association, as this is the time most women discontinue breast feeding.

Like the previous study discussed above, a study done in Brazil identified maternal depression as one of the independently associated factor for discontinuation of breast feeding. And those women with moderate and severe depression are at higher risk of discontinuing than women with lower level (24). Though we did not assess across the severity of the symptom, we tried to observe the variation of risk of discontinuation of breast feeding on its recurrence. Nevertheless, no difference was found on discontinuation of breast feeding between women with persistent CMD both at pregnancy and postpartum, women with CMD either of the two times and women with-out CMD. This variation might be due to the different instruments used by the two studies. In our case, we used SRQ, while the Brazilian study used BDI and the total follow up time is also different. Other studies conducted in Japan (23) and Italy (26) also came up with similar finding. The Japanese study identified that women with higher depression scale were at higher risk to switch from breastfeeding to formula at 5 month as compared to non depressed women. Similarly in Italy, those women with higher EPDS were more likely to bottle feed at 3 month

postpartum period (26). Even though they were following for shorter period of time as compared to our study, a study done in California also reported that depression was one of the factors for discontinuing breast feeding before 12 week (57). Overall, discontinuation of breast feeding before 2 year was 33.7% according to our study which is higher than the national figure of Ethiopia which is 18% (39).

According to a prospective cohort study done in Australia, the median duration of breastfeeding was 26 weeks for women with early-onset depression, 28 weeks for women with late-onset depression and 39 weeks for women without depression (27). These study is similar with our study both in the design, sample size and more or less the time they measured the outcome, however, the variation might be owing to the study settings in which the two studies were conducted; the Australian study was institution based (conducted in two urban hospitals), while our study was population based where majority of our participants were rural dwellers.

The total duration for breast feeding also varies among women with CMD and without CMD in some studies. But, in our study no significant difference was observed on the total duration of breast feeding between women with CMD and women without CMD. However, a study in Canada reported that the mean duration of breast feeding is significantly lower among women with early onset depression than women with late onset depression (29). Conversely, a case control study conducted in urban southern Brazil did not find any significant association between PPD and early termination of breast feeding at four months after delivery (31).

According to our study, the overall mean duration of breast feeding was 22.3 month which is slightly smaller than the national report which is 25 month (39). This is may be owing to the fact that we only follow up to 24 month post partum, but the national survey assess the total duration crossectionally and there might be mothers who continued breast feeding even after 2 years. If we extended the time beyond 2 years, we could have come up with similar number. However, the median duration of breast feeding in China was 9 months. The reason for this might be different, like socio demographic factors and sociocultural factors such as work habit and work overload in the country (55). This also relates with their one child policy which made them primiparouse as many study reveals that primiparouse mothers are most likely to discontinue breast feeding than multiparouse mothers.

In our study discontinuation of breast feeding was independently associated with Mesekan and Silete ethinic groups, older maternal age, history of obstetric complication, high parity and infant birth weight. Discontinuation of breast feeding varies across different ethnic group. Women from Meskan and Silte ethnicity were 50.9% and 45% at higher risk of discontinuing breast feeding as compared to women from Mareko ethnic group, respectively. This kind of variation on discontinuation of breast feeding was reported from a study done in California, which found that Asian women were above two fold at risk to discontinue breast feeding than other ethnic groups like Hispanic, black, white and multicultural white women (57). There is also a black-white disparity in breastfeeding duration reported from study done in china (55). In contrary, no statistically significant association between ethnicity and duration of breast feeding was reported from Philadeliphia study (54).

Our result indicates that older maternal age is positively associated with discontinuation of breast feeding. Those mothers who are between 35-49 years were 51.1% less likely to discontinue breast feeding as compared to young mothers. This is in line with several studies done in USA (30), Japan (23), Philadelefiya (54), China (55) and Ireland (58). Having any obstetric complication on current delivery was also negatively associated with discontinuation of breast feeding according to our study.

Parity mediates the association between infant feeding method and maternal depressive symptoms in the postpartum period (7). A study in New York found that breast-feeding by multiparas was associated with significantly decreased odds of having depression compared with bottle-feeders (OR=0.41, CI: 0.19–0.87, p=0.02); however, no risk reduction from breast-feeding was evident among primiparas. Our study also found a statistically significant association between discontinuation of breast feeding and parity. Grand parouse mothers were less likely to discontinue breast feeding as compared to primiparouse women. This finding is supported by a large scale cross sectional study done in Japan which reported that multiparouse women are 72% more likely to continue breast feeding than preimiparouse women (23). Conversely, a study conducted in Philedelfia found that those women with lower parity were more likely to breastfeed until they were discharged from the hospital than women with higher parity (54). On the other hand, no significant difference was observed on duration of breast feeding among

primaparouse and multiparouse women in Tokyo (p= 0.63) (40). In Ireland, high levels of breast feeding was found both in first-time mothers and mothers who breast fed before (58). The reason behind why multiparouse women will continue breast feeding than preimiparouse women in our study can be because multiparouse women are experienced and do not face breast feeding difficulties. Besides, unlike primiparouse mothers, most multiparouse women are relatively older. Therefore, they can accept and follow breast feeding as one of sociocultural practices, so that they may continue breast feeding much better than primiparouse mothers.

One of the factors which are independently associated with duration of breast feeding was infant birth weight. In our study, those women with low birth weight child were 59.9% less likely to discontinue breast feeding as compared to women with normal BWT child. This is in contrast with another study done in Japan. In their study women with LBW child were 33% less likely to continue breast feeding than women with normal BWT child (77). In contrast, no statistically significant association between discontinuation of breast feeding and infant weight was reported from other studies (54, 55).

Traditional malpractices like pre-lacteal feeding and early introduction of complementary food is common barriers to optimal breastfeeding practices. The practice of giving prelacteal feeds is discouraged because it limits the infant's frequency of sucking and exposes the baby to the risk of infection.

In our study, total Prelacteal feeding practice among both exposed and unexposed group was 4.7% which is lower than overall prelacteal breast feeding practice in Ethiopia which is 27% (39). This is almost equivalent with the national survey report of Nepal which is 26.5% (71). Prelcateal feeding varies across different countries. It is 25% in Tanzania, 16.9% in India(72) , 9.1% in Nepal (78) and 57% in Uganda (79). Extensively large percentage of prelacteal feeding was reported from the vietenam 73.3% (68). This variation may be due to larger sample size, and different study design used between these all studies and the specific sociocultural practices and religious believes in the respective area.

According to Ethiopian national survey, prelacteal feeding also varies by region, most commonly practiced in Somali 73% and only 10 percent of children residing in SNNP receive prelacteal feeds. Since our study was done in one of SNNP regions, these might be the possible reason to have smaller percentage of prelacteal feeding as compared to the national figure(39).

One of the determinant factors for prelacteal feeding in this study was mode of delivery. Those mothers who delivered through operative methods were four times at risk to give prelacteal feeds. This finding is in accordance with that of a study done in India which reported that delivery by cesarean section were above two times more likely to practice prelacteal feeding (72). And a study in veitenam also showed that CS delivery increases the risk of prelacteal feeding about three folds (68).

According to EDHS Prelacteal feeding is more common in rural areas than urban areas(39). Conversely in our study it is more practiced among urban dwellers than rural residents. These may be because now a days CS is becoming more common in urban settings. So this could be interrelated with mode of delivery. However a cohort study which is done comparatively among the rural, suburban and urban areas found that prelacteal feeding is very common in urban areas than rural and suburban areas (80). Other supporting finding is from Nepal, they reported that women who reside in urban areas were two times more likely to give prelacteal feeds to their infants than who reside in rural areas.(78)

Our study indicates that Children whose mothers were assisted by doctors and other health professional were less likely (68.3%) to provide prelacteal feeds. This is consistent with the national survey report which stated that those mothers who were assisted by a health professional were less intended to give prelcateal feeds to thieir infants as compared to those mothers assisted by TBA and other relatives and neighbours. This is also similar with the vietenam study which reported that health staff support during birth reduces the prelacteal feeding (68).

Our result indicates that there is statistically significant association between CMD and prelacteal feeding practice. Those mothers with antenatal CMD were almost two times more probable to give prelacteal feeds to their child as compared to mothers without antenatal CMD. To our knowledge, similar information is not reported in the literature and thus no comparison could be made. However, the possible explanation for this association could be, symptoms of CMD at

antenatal period may persist and exacerbated during delivery and immediately after birth. Therefore, mothers may not be able to take care of their child and initiate breast feeding immediately. Therefore the risk of feeding any other prelacteal feeds could be common. The other reason could be, it was found that persistent CMD is significantly associated with Socio cultural Practices, therefore mothers with CMD may involve in different socio cultural practices and traditional believes like thought of giving liquids and butter to clean the baby's throat and stomach, that may influence them to give prelacteal feeds.

Strength and limitation of the study

Strength of the study

- Population based study
- Retrospective cohort study design which enables to see the temporal relationship of the association

Limitation of the study

- Recall bias because women were asked about the time when they stop breast feeding was measured at 2.5 year. To reduce this, data collectors were supporting them to recall the exact time in relation to holy days and other memorable events.
- There were some missing values but it is not as expected as in secondary data. This is because of close follow up of the coordinators and supervisors to monitor the data quality during the data collection. Women were re-interviewed within one week when data was missed. Some missing values were managed accordingly using SPSS.
- It did not include important variable like HIV status of the women which can be a factor for discontinuation of breast feeding before 2 year.

7. Conclusion

In summary, this study showed that there is no significant association between perinatal maternal CMD and discontinuation of breast feeding before two year. Socioeconomic factors like ethnicity, maternal age, education and obstetric factors like parity, and birth weight are statistically significant factors for discontinuation of breast feeding. This study also revealed that there is statistically significant association between prelacteal feeding and antenatal CMD. The risk of prelacteal feeding is two times higher among women with antenatal CMD than whose women without antenatal CMD at third trimester pregnancy. Other important determinant factors identified for prelacteal feeding are residence, mode of delivery and birth attendants.

In conclusion, CMD has statistically significant association with prelacteal feeding. However, no statistically significant association was found between CMD and discontinuation of breast feeding in this study.

8. Recommendation

- Ministry of Health need to consider perinatal maternal CMD as one of major public health problem which has negative impact on optimal breast feeding practice specifically with prelacteal feeding. It is recommended for planners and policy makers in collaboration with Ministry of Health to design and integrate maternal mental health with the general maternal and child health service in order to enhance optimal breast-feeding practices in Ethiopia.
- Health professionals need to routinely screen those women who came to receive ANC and post natal care service for CMD, so that it would be possible to prevent and intervene accordingly. It is advised to provide appropriate counselling service for those women about optimal breast feeding practice and avoid CS and instrumental delivery as much as possible.
- It is recommended to promote The Baby Friendly Hospital Initiative (BFHI) which can encourage the early initiation of breastfeeding and discourage the introduction of prelacteal feeds and formula feeding.
- It is also recommended to government and non government sectors to advocate proper optimal breast feeding and IYCFS feeding practice.
- Health extension worker and other responsible bodies need to create awareness about institutional delivery and MOH and NGOs need to work collaboratively to make all health institutions accessible and convenient to all women in order to make all deliveries to be attended by health professionals and decrease risk of prelacteal feeding practice.
- Further large scale prospective studies with close follow up and repeated measurement of outcome at important time points need be conducted.

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Annexes

Annex1 - check list

1. Personal identification					
No	**Question**	**Response**			
101	**Age**				
102	**Ethnicity**	Welene Sodo Dobi Meskan Mareko Silti Amhara Oromo 66.Other specify Don't know Refused / no answer			
103	**Religion**	Orthodox Christian Muslim Catholic Protestant No religion 66. Other specify 99. Refused/ no answer			
104	**Education**	None Informal only Formal Refused / no answer			
105	**If Formal**	Grade			
106	**work**	Farming Trading / related occupation Animal Husbandry managerial / administrative Transport Craftsmen / related production Labourer Student Unemployed Housewife Other (specify) Refused / no answer			
2. Socioeconomic status					
201	**History of hunger in the last month** Yes No		**pregnancy**	**2 month postpartum**	**12 month postpartum**
202	**Debts that you can't pay** Yes no				
203	**cash savings or ability to lend to others** 1. Yes 2.No				

204	**Major financial crisis** Yes No Don't know Refused			
205	**Husband unemployment** Yes No Don't know Refused			
	3. Community and social support			
301	**Family support** Yes No Don't know Refused			
302	**Non family support** Yes No Don't know Refused			
303	**Attend a group or organization?** A)None B) Civic/ political union C) Social work D) Women's org E) Religious org F) Funeral support G) Other_____			
304	**Help with the housework** 1. Yes 2. No 88. Don't know 99. Refused			
305	**Help looking after your children** 1. Yes 2. No 88. Don't Know 99. Refused			
306	**Serious illness, injury or an assault?** Yes No Don't know refused			
307	**Violence** Less The same Get worse			
308	**Death of spouse, parent, friend, child** 1. yes 2. No 3. Don't know 4. refused			

401	**Marital status**	Monogamous marriage Polygamous, 2 wives Polygamous, 3 wives Polygamous, 4 wives Divorced Separated Never married Widowed		
402	**Type of marriage**	Legal, with consent Legal, without consent Abduction by consent Abduction without consent Widow inheritance		
403	**Husband age**	_____years		
404	**Husband education**	None Primary School Secondary Further education		
405	**Type of husband's work**	Farming Trading / related occupation Animal Husbandry Professional / managerial / administrative Transport Craftsmen / related production		
406	**Husband preference on child sex**	Girl Boy		
407	**Overall relationship** Very good Good Average Bad very bad			
408	**Help from your husband** Yes no			
409	**How often you quarreled with your husband?** Rarely Sometimes Often Never happened Don't know Refused / No answer			
410	**Husband alcohol drink** Daily 1-2 /wk 1-3 / month <1 time a Doesn't drink Don't know Refused			

411	**How often does your husband chew Khat?** Daily, 1-2x per week 1-3 x per month, <1x per month, he doesn't chew, I don't know, Not willing to answer				
412	**Separation due to marital problem** 1. Yes 2. No 3. Don't know 4. refused				

4. Reproductive History

501	**Months of pregnancy**	_____months
502	**Planned/ unplanned**	yes No
503	**Do you mind about child sex**	Yes No Don't know Refused
504	**Which do you prefer**	Boy Girl
505	**Is your husband happy about your pregnancy?**	Yes No Don't Know refused
506	**ANC follow up for current pregnancy**	Yes No
508	**If yes, how many times?**	_____
509	**Are you worried about delivering your baby?**	Yes No
511	**Number of pregnancies**	_____
512	**Age at first pregnancy**	_____years
513	**Time gap between now and your previous pregnancy**	<1 year 1-2 3-4 5-6 >6
514	**History of any complication during delivery**	Long labor <24 hours 24-48 hours >48 hours Heavy bleeding after delivery yes/ No Fever within one week of birth? Yes/ No Instrumental Delivery (forceps/vacuum) yes/ No Operative delivery (Caesarian Section) Yes/ No

515	**Number of pregnancy**	**Age at pregnancy**	**Birth Outcome**	**Infant outcome**	**Sex of the child**
			Aborted Stillbirth Live birth	Died < 1year Died >1 year Living_____age	Boy Girl

5. Emotional problems

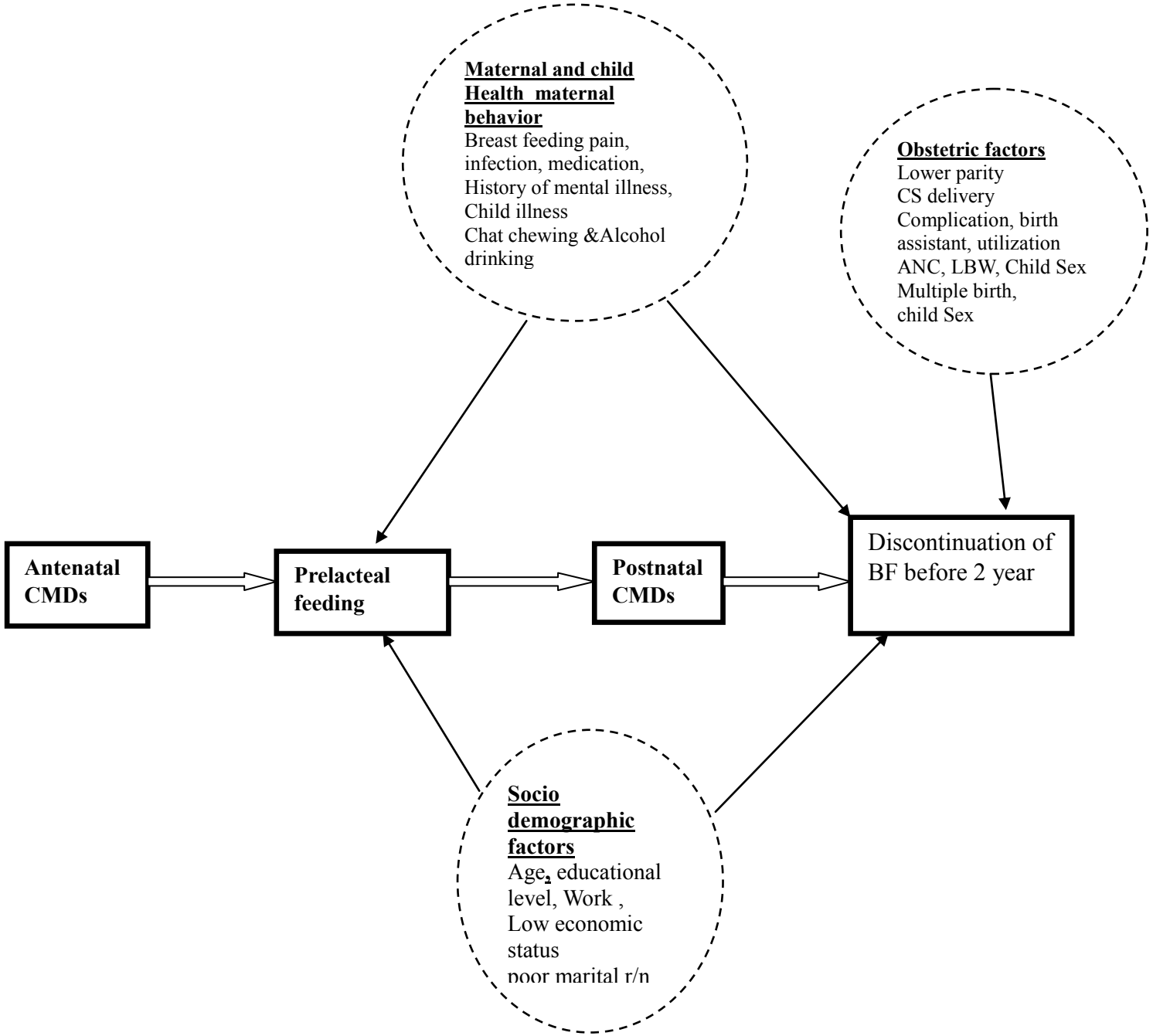
601	**Any emotional disturbance?**		1.Yes 2.No		
602	**If yes, when?**		_____ years ago		
603	**Receive treatment**		1.Yes 2.No		
604	**History of these problems after giving birth in the past**		1.Yes 2.No		
605	**emotional disturbance after becoming pregnant**		1.yes 2. No		
606	**Family history of mental problem**		1.Yes 2.No		
	6. Maternal behavior				
701	**Ever chewed Khat** 1. Yes 2. No		**pregnancy**	**Postnatal 2 month**	**Postnatal 12 month**
702	**Chew Khat now** 1.Yes 2. No				
703	**If yes, how often?** 1. Every day or nearly every day 2. Once or twice a week 3. 1-3 times a month 4. Occasionally, less than once a month				
704	**Do you smoke now?** Yes No				
705	**Do you drink alcohol now?** Yes No				
	7. Physical health				
801	**History of any symptom in the past 4 weeks.**	**Symptoms**	**Pregnancy**	**2 month Postnatal**	**12 month postnatal**
		A. Stomach pain B. Back Pain C. Pain in your arms, legs or joints D. Vaginal discharge E. Headaches F. Burning sensation of the head G. Chest Pain H Dizziness J. Fainting Spells K. Feeling your heart pound or race L. Shortness of breath M. Pain during sexual intercourse N. Constipation, diarrhoea P. Nausea, indigestion Q. Urinary problems R. Incontinence			

803	**Maternal disease**	1. Malaria 2. Tuberculosis 3. Liver disease 4. Kidney disease 5. Heart disease 6. Peptic ulcer 7. STI 8. Mitch 9. Likift 10. Megagna 11. Yesawayn 12. Wukabe/Zar 13. Wind (Birrd) 14. Other (specify)			
804	**History of taking medication**	Yes No			

1001	**Preterm baby**	>2 weeks earlier At the right time >2 weeks later
1002	**Multiple birth**	Singleton Twins (?exclude?) Triplets or more
1003	**Physical problem with the new born**	Yes ,specify_____ No
1004	**Child sex**	Boy Girl
1005	**Where she gave birth**	Parent's home Own home Neighbour's house Health Post Health Centre Hospital Private Clinic Other (specify)
1006	**Birth Assistant**	No-one Relative Neighbour Untrained TBA Trained TBA Midwife Doctor Other health worker
1007	**Mode of delivery**	Spontaneous instrumental operative (CS)
1008	**Complication with in 24 hour after delivery**	Bleeding Fever Seizure Other specify
1010	**Initiation of breast feeding**	Immediately / within 1 hour 1-8 hours >8 hours and <24 hours >24 hours

1011	**Colostrum given**	Yes No		
1012	**Prelacteal feeding**	Yes No		
1013	**Are you breastfeeding**	yes no		
1014	**If no, how long ago did you stop?**	_____weeks ago		
1015	**Since this time yesterday, have you breastfed?**	Yes No		
1016	**Frequency of breast feeding yesterday b/n sunset and sunrise**	_____times On demand		
1017	**Frequency of breast feeding yesterday during daylight.**	_____times On demand		
1018	**Since this time yesterday has your baby received any of the following:** Plain water Sweetened or flavoured water (include sugar cane water) Teas or infusions Tinned, powdered or fresh milk Milk (not breastmilk) Infant formula Other liquids (include soups and broths) Mushy or solid foods Does your baby have any difficulty feeding?	**1 week**	**2 month**	**12 month**
1019	**Age at which solid food started**	_____month		
1020	**History of child Feeding difficulty** Yes No			
1021	**Child illness** **Type of disease** Diarrhea Cough fever			
1022	**If diarrhea, Frequency of Breast feeding with diarrheal episode.** Increased Decreased The same			
1023	**History of fast breathing** Yes No			
1024	**History of taking any medication** Yes No			

Annex II Conceptual frame work



Declaration

I, the under signed, declare that this thesis is my original work, has not been presented for a degree in any other university and that all resources of material used for this thesis have been fully acknowledged.

Name: Abigiya Wondimagegenehu

Signature_____

Date of submission July 8, 2014

Place: Addis Ababa University

This thesis has been submitted for examination with my approval as University Advisor.

Dr. _____

Signature _____

Date : July 8, 2014