ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF BREAST-FEEDING PRACTICES IN OROMIA REGION: AN ANALYSIS OF THE 2005 ETHIOPIAN DEMOGRAPHIC AND HEALTH SURVEY

By
ALLENE LISANEWORK
JUNE 2008

ADDIS ABABA UNIVERSITY

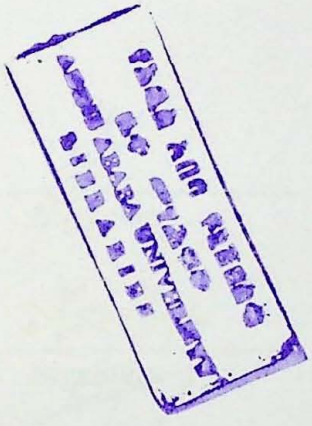
SCHOOL OF GRADUATE STUDIES

INSTITUTE OF POPULATION STUDIES

DETERMINANTS OF BREAST-FEEDING PRACTICES IN OROMIA REGION: AN ANALYSIS OF THE 2005 ETHIOPIAN DEMOGRAPHIC AND HEALTH SURVEY

BY

ALLENE LISANEWORK



Thesis Submitted in Partial Fulfillment For the Requirement of the degree of Masters of Science in Population Studies in the Addis Ababa University

June, 2008

Addis Ababa

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Determinants of Breast-feeding Practices in Oromia Region: An Analysis of the 2005 Ethiopian DHS

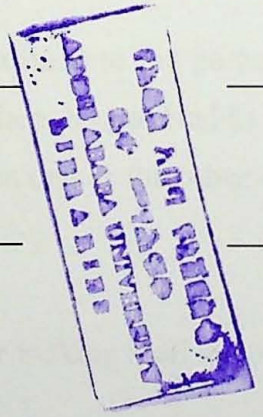
By

Allene Lisanework Woldemariam

Institute of Population Studies
College of Development Studies

Approved by the Examining Board

Dr. Terefe Degefa Chairman, Department Graduate Committee	Signature
Dr. A. Sathiya Susuman Advisor	Signature
Dr. Negatu Regassa External Examiner	Signature
Dr. Terefe Degefa Internal Examiner	Signature



Acknowledgement

I would like to express my heartfelt gratitude and appreciation to my advisor, Dr. Sathiya Susuman for his invaluable direction, support and advice, for reading and commenting on from the first to the final draft of the thesis and for giving me his precious time when ever I needed his help.

I am deeply indebted to my family, my wife, Alem Kidane and my daughters, Arsema, Adiam and Abigia Allene for their perpetual love which helped me in coming out of many troublesome moments during my study while also costing the love and care that was expected from me. I am glad you will have something to read about what I have been doing in the past two years when you were grown up. You do not deserve to live in such a tense unstable environment. I will do whatever is necessary to ensure your safety, Well-being and happiness.

I can't express the appreciation I have for my friends Girma Abera and Abebaw Bihonegn for their unreserved support, encouragement and concern during the whole period of the thesis work. My thanks also go to my sister, W/O Mulat Getachew for her generous help in the whole process of the thesis work. All IPS Staff members, IDR library staff and my classmates should also deserve many thanks.

My heartfelt gratitude goes to my sister Ziada Kidane. It would have been difficult to complete my work with out her unreserved support. I would like also to thank Simret and Helen Kidane and Abdulmegid Abdella for their help whenever I needed.

Finally, I would like to express my deepest gratitude to my parents, my mother, Aregash Yimam and my father Lisanework W/Mariam, my brothers Kassa, Haddis and Fekade Lisanework and my sisters Fantaye and Berhane Lisanework, who in one or the other way have been sharing my pains in my life and in the process of the study.

Last but not least, I would like to thank God, for making it all happen.

TABLE OF CONTENT

List of Tables

List of Figures

Acronyms

CSA	Central Statistical Agency
EDHS	Ethiopian Demographic and Health Survey
LLLI	La Leche League International
NFFS	National Family and Fertility Survey
NFS	National Fertility Survey
UNICEF	United Nation International Children's Education Fund
WFS	World Fertility Survey
WHO	World Health Organization
OESPO	Oromia Economic Study Project Office

Abstract

Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants and has a unique biological and emotional influence on the health of both mother and child. Moreover, breastfeeding is known to be among the most important proximate determinants of fertility in most developing countries. However, despite all this, most women in Oromia discontinue breastfeeding before the recommended time. Moreover, declining trends in the prevalence and frequency of breastfeeding have been observed. Nonetheless, little or no attempt has been made to identify the factors affecting breast-feeding practices in the region.

This study, therefore, aimed at identifying the major determining factors of early initiation, intensity and duration of breastfeeding in the region. The study used data obtained from the 2005 Ethiopian Demographic and Health Survey (EDHS). Moreover, primary data collected through in-depth interviews from key informants was used to substantiate the findings. A total of 1211 currently married women aged 15-49 who gave birth to at least one child in the last five years preceding the survey and residing in the region were included in the study.

Initially, bivariate analysis (Chi-square test) was used to examine the differentials in the timing of initial breast-feeding, intensity and proportion of women breastfeeding at different durations across the different socio-economic, demographic and health care Characteristics of the mother. At the multivariate level, Logistic regression technique was employed to identify the most important predictors of early initiation and intensity of breastfeeding. Multiple Classification Analysis technique was applied to identify the most important factors affecting duration of breastfeeding

Results of the multivariate analysis indicate that the most important factors that significantly affect timing of initial breastfeeding were age of mother and contraceptive use. Older mothers have shown to put the newborn to the breast within an hour after birth than younger. On the other hand, contraceptive users were less likely to initiate breastfeeding immediately than non-users. With regard to intensity of breastfeeding (up on demand), parity and work status of mothers are the most important factors that affect the practice. Mothers of higher parity and those not working had higher chance of breastfeeding intensively than lower parity and working mothers. Regarding duration of breastfeeding, age of mother, bottle-feeding, religion, work status and contraceptive use were found the most important variables that significantly affect duration.

Finally, based on the findings, the study suggests that would contribute to interventions aimed at reducing barriers of breastfeeding practices. Attempts to promote and support to an increased in the rates of immediate breastfeeding within an hour of birth, longer and frequent breastfeeding would have a significant impact to reduce the existing high fertility and infant mortality in Oromia. Hence, raising of awareness of young, educated and those mothers using feeding bottles about the manifold benefits of breastfeeding through information, education and communication (IEC) programmes using mass media such as radio, television, posters and magazines, is of paramount importance.

CHAPTER ONE

INTRODUCTION

1.1. Introduction

Breastfeeding practices of women in developing countries are critical determinants of child survival, maternal reproductive health, and population growth rates. Breastfeeding for the first two years of life and beyond protects the child from infection; provides an ideal source of nutrients, a cost-effective and safe form of feeding; fosters mother-child bonding, and lowers the risks of early childhood deaths. In children not breastfed at all, the risk of early death from diarrhea, respiratory disease, and other common childhood illnesses rises dramatically compared with children who are exclusively breastfed. Breastfeeding also benefits the mother by helping the uterus to retract, which can reduce postpartum blood loss, and delaying the return of menses, thereby preventing a subsequent closely spaced pregnancy (WHO, UNICEF, 2006). Thus, for poor countries where the prevalence of contraceptive use is low, appropriately managed breastfeeding can be a key component of reproductive health programs.

Despite this, the practice of breast-feeding seems to have been adversely affected by the modernization of society. In the developed world, though breastfeeding initiation rates appear to have increased since 1971 through late 1980's, the recent trend may be leveling off. Evidences indicate that over 80 per cent of Australian women in 2001, 71 percent of mothers in the United States in 2003 (Marild Hansoon *et al*, 2004), 69 percent in UK in 2000 (Oken, 2001; Lightdale, 2001) initiate breastfeeding, although lower than those rates achieved in Norway and Sweden (97 and 99 per cent) (ibid, 2004). However, most of the mothers stop before their infants reach six months of age, such that the duration of breastfeeding was considerably shorter than recommended. A number of studies have shown that lack of nutritional knowledge amongst health workers (Hoyer and Horvat, 2000) and lack of adequate information being given to mothers are major factors responsible for the decline in the intensity and duration of breastfeeding. Socio-economic factors, such as maternal education and working pattern of mothers are also known to influence breastfeeding practices (Rasheed, Siddiqui, Baig, 2000). Breastfeeding is universal in most developing countries. In spite of that, early termination of breast-feeding has been observed in a

substantial proportion. Factors responsible for this are: urbanization, female participation in labor force, increased availability of processed milk and their promotion both by companies and health sectors and regimentation of breast-feeding (WHO, 2001).

In Ethiopia, similar to other developing countries, breast-feeding is widely practiced (Abdulahi, 1989). Many previous studies have shown that about 90 percent of mothers were breast-feeding their children for up to 2 years of age (CSA, 1993). Recently despite a slight rise in the timing of initial breastfeeding most women discontinue breastfeeding before two years. The effects of maternal age, education, working pattern and urbanization are the most cited variables responsible for this by the earlier studies, which were undertaken in various parts of the country (Abdulahi, 1989; Eshetu, 1994; Yeshewamebrat, 1995; Daniel, 2001). In recent years, while prolonged breastfeeding is still the norm in Oromia region significant divergence in breastfeeding practices has been observed from internationally recommended optimal practices. Besides this, a declining trend has been observed in the intensity of breast-feeding in the region. Results of the 2000 and 2005 EDHS, for instance, show that the mean number of day and night feeds has dropped from 8 and 6.1times in 2000 to 6 and 5.7 times in 2005,respectively in Oromia region. Nonetheless, much has not been done recently to identify the important factors responsible for the decline in breastfeeding practices in the study area. Moreover, the impact of bottle-feeding, maternal health care behavior and contraceptive use on breast-feeding practices has not been examined by the previous studies. The purpose of the present study is, therefore, to identify the most important demographic, socio-economic and health care variables, which are adversely affecting optimal breastfeeding practices in Oromia region.

1.2. Statement of the problem

Breast-feeding is an ideal method of feeding and nurturing infants and possibly to promote the postpartum (Haggerty, 1999). Breast milk helps the healthy growth and development of infants and has a unique biological and emotional influence on the health of both mother and child (WHO, 2002). The advantages of breastfeeding are also widely documented (Cunningham *et. al.*, 1991; Renfrew and McCandish, 1992; Robertson and Goddard, 1997) and, in general, undisputed (Booth, 2001). In the developing world breastfeeding is strongly correlated to a reduction in infant mortality and morbidity (UNICEF and WHO, 2003; Booth, 2001). This is due to the fact that the first breast milk contains colustrum, which is highly nutritious and has anti-infective properties.

In addition to its nutritional and immunological benefits, prolonged and intensive breast-feeding increases the birth interval through delaying the resumption of ovulation after birth and hence controlling overall fertility (Edmond *et al*, 2006; WHO, 2001 and Abdulahi, 1989). Several studies indicated that breast-feeding is the primary factor affecting the length of birth intervals for 83 percent of couples in developing countries that do not use modern form of contraception (Barry, 1990). Exclusive breast-feeding is also recommended for all mothers in HIV-endemic areas, including HIV-positive mothers where alternatives to human milk are not acceptable, feasible, affordable, sustainable, and safe for mothers and their infants. Exclusive breast-feeding is associated with two to four times lower rates of mother to child transmission of HIV compared to non-exclusive breast-feeding, and helps foster reduced illness and death among infants of HIV-positive mothers (WHO, UNICEF, UNAIDS, UNFPA, 2006). On the other hand, breastfeeding within one hour of birth increases the likelihood that mothers would live by helping prevent post-partum hemorrhage (Edmond *et al*, 2006). Breast-feeding may also protect women from developing breast cancer in later life (Newcomb, 1994) and certain ovarian cancers (Rosenblatt, 1993). Some research findings outline not only the advantages of breast-feeding, but also highlight the disadvantages of formula feeding (bottle-feeding), even in developed countries (Dudsdieker *et.al*, 1994; Gerstein, 1994). Consequently, in the most recent systematic review of the literature, exclusive breastfeeding is recommended for about six months, with continued (prolonged) breast-feeding for two years or longer (WHO, 2002).

Breast-feeding is universal in most of the developing countries. According to the 2001 World Health Organization report that in most developing countries, substantially more than 50 percent of all infants were breastfed up to 12 to 15 months of age, and more than 25 percent were breastfed up to 20 to 23 months. The median duration of breastfeeding among children born in the last three years preceding the survey ranged from 17 to 28 months in African countries. Yet, consistently across all countries, the mean duration of breastfeeding was from 5 to nearly 100 percent greater in rural than in urban areas. Despite this, the prevalence and duration of breast-feeding have declined in most developing countries for a variety of social, economic and cultural reasons. With the introduction of modern technologies and the adoption of new life-styles, the duration, frequency and the importance attached to this traditional practice have been noticeably reduced (WHO and UNICEF, 2003).

In Ethiopia about 96 percent of children, both urban and rural, born in the five years preceding the survey having been breastfed at some time (EDHS, 2005) and this varies minimally across regions. The mean duration of any breast-feeding is long with 25.5 months in 2005 (CSA & ORC, Macro, 2005).

Although 94.8 percent of children born in the last five years preceding the survey in Oromia region initiate (ever breastfeed), the rate declines to 35 percent at 24 months and only about 19 percent of them practiced prolonged breastfeeding i.e. beyond 24 months (CSA & ORC, Macro, 2005). More over, prevalence of breastfeeding in Oromia is the lowest next to Addis Ababa in the country and has been dropped from about 96 percent in 2000 to 94.8 percent in 2005 (ibid, 2005).

With regard to timing of initial breast-feeding, contrary to UNICEF and WHO's recommendations, that mothers put the newborn to the breast immediately or within an hour after birth, only about 72 percent of mothers initiate breastfeeding immediately. Rejection of the first milk (colustrum) is also observed that 61 and 53 percent of urban and rural mothers did not feed their children with colustrum. In addition, the intensity (frequency) of breast-feeding is not optimal and even declining in the region when compared to the rate in 2000. The proportion of children (below six months) who breastfed 6 and more times in the last 24 hours in Oromia region was the lowest with 93.4 percent (which was 94.4 percent in 2000) compared with 100 percent in Somali, Gambela and Dire

Dawa, and with 99 and 98 percent in Tigray and Afar regions, respectively. Even when compared with international standards, the figure was low. Contrary to UNICEF and WHO's recommendations, that children especially under six months should breastfeed at least once every two hours, only 31 percent of women who gave birth in the last three years preceding the survey in Oromia region breastfed for the recommended intensity, which is also lower than the figure in 2000, EDHS.

Understanding and identifying the socio-economic, demographic and maternal health care characteristics (variables) that affect breast-feeding practices (timely initiation, intensive and prolonged breast-feeding) could help to formulate appropriate policy interventions or actions to mitigate such problems or to improve breastfeeding practices, which are a significant elements in reducing the existing high fertility and moderately high infant mortality in the region.

Previously, studies in Oromia documented that women in rural and urban areas on average breastfeed their babies for slightly different durations, 18.8 months in urban compared to 20 months in rural areas (Jimma & Brown University, 2002). Age differences in breast-feeding durations are, however, quite significant and follow a clear pattern with younger women breast-feeding for shorter durations than older women. The mean duration of breast-feeding for women aged 20-24 is17.2 months compared to 21.6 months for women aged 40-44 (ibid, 2002). Abdulahi (1989), in his comparative study between rural (Alemaya and Mettu) and Addis Ababa also shows that age of mothers has positive relation and place of residence of mothers inversely affects the duration of breast-feeding, respectively. Nonetheless, much has not been done recently (in the last ten years) to identify the determinants of breast-feeding practice in Oromia. Furthermore, majority of the researches didn't examine the impact of bottle-feeding, contraceptive use, maternal health care behaviors (place of delivery and type of delivery assistant) on early initiation, frequency and duration of breast-feeding in Oromia.

In light of this, therefore, the current study using data from EDHS, 2005 have attempted to fill this gap and identify the most important demographic, socio-economic and health care factoprs affecting breast-feeding practices in Oromia. The current status and trend of the problems also needs to be studied in detail in the study area. The need for this study also arises as the population

policy of Ethiopia (TGE, 1993) considered the promotion of breast-feeding practices as one of the strategies to achieve the objectives of reducing the existing high fertility and child mortality, While also, the Millennium Development Goal indicators of Ethiopia (MoFED, 2005).

1.3. Review of related literature

Given the widely documented benefits of breast-feeding, numerous literatures out lined a range of socio-economic and demographic characteristics of women which affect timely initiation, frequency and duration of breast-feeding.

1.3.1. Socio-economic determinants (variables)

In this section, socioeconomic characteristics that are going to be considered in the study such as maternal education, work status, place of residence, contraceptive use and bottle-feeding were reviewed. Studies conducted in many developing countries (Trussell *et al.* 1992; Feyisetan, 1990) documented that socio-economic factors mainly extend their influence on breastfeeding practices indirectly through mother's choice of infant-feeding modes (bottle-feeding), contraceptive use and maternal health care characteristics.

a) Maternal Education

Education has long been recognized as a crucial factor in making a difference in the duration of breastfeeding (Daniel, 2001; Yeshewamebrat, 1995; Trussel et.al, 1992). It is usually hypothesized that mothers with lower educational level are still conservative, sticking more to the traditional systems. Hence, breastfeed for longer duration and more often than mothers with higher educational level and rational ideas (Feyisetan, 1990). This inverse relationship may also be due to the fact that educated women are more exposed to mass media and printed materials concerning the contraceptive use and breast-milk substitutes. Educational attainment is also closely associated with working away from home and urban residence where breast-milk substitutes are available and easily marketed. A study of trends and differentials in breastfeeding by Trustell et al. (1992) using the data from World Fertility Survey (WFS, 1987) and DHS from Kenya and Sudan also shows that women who have secondary education breastfed for about four months shorter than those with no schooling. Moreover, the 1990 National Family and Fertility survey of Ethiopia documented a difference of 9 months between these groups. This association, however, is not confirmed in some

developed countries since data from e.g. United States (Eckhardt et al, 1983) demonstrate that the higher the educational level, the longer the duration of breastfeeding. This may be due to the parental awareness or consciousness about the diverse advantages of breastfeeding through the reading of books, magazines pediatric advice and regular attendance of prenatal clinics, of which most uneducated women have no access to.

b) Work Status of Women

It is suggested that work status of women is inversely related to the frequency and duration of breast-feeding. There are several evidences indicating that non-working women breast-fed for longer duration than those who work at home or away from home (Daniel, 2001; Yeshewamebrat, 1995; CSA, 1995; and Trustel *et al*, 1992). This is owing to the fact that mothers who stay at home may often have enough time to care for their infants and breastfeed on demand or at shorter intervals than those working away from home and return only in the evening. Results of a study indicated that non-working women breastfeed for about 6 months longer than those working away from home and 2 months longer than those who work at home (Eshetu, 1994). Contrary to this, results of the 1990 National Family and Fertility survey of Ethiopia showed that working mothers breastfeed longer than not working. Moreover, in a longitudinal study conducted in Bangladesh, currently working mothers consistently showed a longer duration of breastfeeding than non-working women (Haider *et al*, 1995). The reason for this may be that, most workingwomen in Bangladesh took their babies with them to their place of work. Again, since the majority of such workingwomen perform physical or manual work, it is reasonable to assume that they are mostly less educated or uneducated.

c) Place of Residence of Women

There are a number of reasons to expect differences in breast-feeding practices between rural and urban women. The employment situation of women differs substantially between rural and urban areas. Most of the urban women have job outside home while the majority of rural women work around their home, on the farm or household sideline industries, or are housewives. In addition, mothers in urban areas are exposed to some other feeding practices (bottle-feeding) since breast-milk substitutes, such as, infant formula, are easily available in the market provided that bottle-feeding is considered as a modern behaviour (Daniel, 2001; Yeshewamebrat, 1995).

Researches across developing countries are consistent regarding the effect of urbanization breast-feeding practices. It is documented that urban women breastfed for shorter duration than their rural counter parts (Perez, 1993;Napaporn, 1990). Trustel et al, (1992) also found that on the average rural women breastfed for about 5 months longer than urban women. Studies in Nigeria and Uganda have found that rural women breast-feed longer and are less likely to use formula or artificial milk than urban women (Orwell et al., 1984; Boerma et al., 1991).

Furthermore, studies in Ethiopia (CSA, 1995; Abdulahi, 1989) documented similar patterns. Abdulahi (1989), for instance, shows variations in breast-feeding durations between urban and rural women, with 93 percent of mothers in Addis Ababa, 96 in Mettu, and 94.7 percent in Alemaya reported to have breastfed their children for varying periods, ranging from four months to over two years. The mean length of breastfeeding for mothers aged 15-49 was 17.8 months in Addis Ababa, while it was about 19 months in Mettu and Alemaya. However, findings in Thailand show that the relationship between breastfeeding and urban residence did not indicate any systematic pattern (Knodell and Debavalya's, 1980).

d) Contraceptive Use

The adoption of modern family planning methods (contraceptive use) in many developing countries also tends to discourage prolonged breast-feeding (Yeshewamebrat, 1995; Barry Edmonston, 1990). However, this is more likely to happen when there is lack of counseling on how to manage breastfeeding successfully (Barry Edmonston, 1990). The national level data for 100 developing countries, using data on the median duration of breast-feeding and contraceptive use rates in 1990, Barry Edmonston (1990) demonstrated that median duration of breast-feeding would decrease as rate of contraceptive use increased. Moreover, studies in Egypt (Akin et al., 1988) and Ghana (Gaisie, 1981) confirmed this inverse relationship. The explanations given for this was, that contraception tends to be preferred by mothers in socio-economic groups (such as those with better education and living in urban areas) that are less inclined towards breastfeeding.

In Ethiopia, the findings of the study done by Yeshewamebrat (1995) in Addis Ababa demonstrated the inverse relationship between contraceptive use and duration of breastfeeding that

about 2.3 percent of the variation in the duration of breast-feeding was attributed to contraceptive use. However, Haider and his colleagues (1995) in rural Matlab, Bangladesh, found a positive association between contraceptive use and duration of breastfeeding. Moreover, in two countries included in 1987 WFS, Indonesia and Sirilanka, contraceptive use is associated with longer breastfeeding duration, indicating that women in these countries are taking advantage of pregnancy avoidance to breastfeed longer than they otherwise could.

e) Bottle-feeding

Bottle- feeding has been shown to interfere with breast-feeding practices and has increased the risk of child mortality and morbidity (Boerma *et al*, 1991). During the last few decades an increase in the use of bottle- feeding has been observed in most developing countries.

In Ethiopia, the finding of the study by Aregai (2000) in Adigrat town demonstrated bottle-feeding was considered as one of the factors that shortens duration of breast-feeding, especially among mothers working outside home compared to housewives. Evidences also have documented an increasing trend in bottle-feeding rising from14 percent among children less than four months of age to 20 percent among children 4-5 months in Ethiopia (CSA, ORC Macro 2005). The impact of bottle-feeding on breast-feeding is more significant among educated, working and urban mothers. This may be due to the fact that these women are more exposed to mass media (information, education and communication) regarding breast-milk substitutes. Besides, bottle-feeding in urban areas is considered as modern behavior (Tigist et.al, 1993). For instance, the results of the study done by Tigist et.al.(1993) documented a negative relationship between bottle-feeding and breast-feeding in Addis Ababa.

1.3.2 Demographic Variables

a) Age of mothers

In societies where prolonged breastfeeding is the norm, weaning usually takes place after the women become pregnant again, older women therefore, tend to breastfeed for longer duration than their younger counterparts partly due to differences in fecundity by age (pregnancy interruptions), and in part older women are more traditional in orientation than younger (WFS, 1987). Besides, younger women lack the experience of breastfeeding practices. This is true at all level of development and Family Planning Programme efforts (ibid, 1987).

Previous studies have generally shown longer breast-feeding durations among older women. For instance, averages of breast-feeding duration by mother's age in Indonesia, Nepal, Tunisia, Thailand and Venezuela have shown large differences (six months) (Ferry and Smith, 1983; Lesthaeghe, 1980).

In Ethiopia some studies also documented the positive relationship between duration of breastfeeding and age of mother. For instance, Abdulahi (1989) documented shorter duration for young mothers, ranging from 16-18 months, while mothers of age group 35-49 years reported to have breastfed for a length of 19-20 months in all the study areas (Addis Ababa, Mettu and Alemaya). Eshetu (1994) also documented that mother in the age group of 35-49 breastfed for about seven months longer than those in the age group 15-24. Further more, the 1993 fertility survey of Addis Ababa confirmed this association that the proportion of women breastfeeding for prolonged (i.e. for 24 months or more) increases with age of mothers. The proportion was 43.3 percent for women aged fewer than 25, it was 48 percent for the young adults (25-34 years) and it was 52.7 percent for older women (45-49 years of age). However, Kugler (1984) documented a non-significant relationship between age of women and duration of breastfeeding in his study in Mexico.

b) Parity

The child's birth order appears to have a strong and positive relationship with both the incidence and duration of breast-feeding (WFS, 1987). Women with low parities are more likely to stop breast-feeding at earlier durations than older women or a woman at higher parities. This might be due partly to pregnancy interruptions and in part through the influence of factors that reflect modernizing influences. Low-parity women therefore reflect the more modernized group and high-parity women the more traditional group that breast-feeds for longer durations. Most studies of breast-feeding differentials have treated age of mother and her parity as almost interchangeable variables. Ferry and Smith (1983) using current status information from 28 WFS countries found that either age or parity is significantly related to the duration of breast-feeding. In almost four fifths of the WFS countries, children who are first or second born are the least likely to have been breast-fed, while children of parity 5 or higher are the most likely (WFS, 1987). In Ethiopia, Tigist

and others (1993) also found a negative relationship between parity and duration of breast-feeding in Addis Ababa.

c) Sex of the Child

Child's sex may influence the duration of breastfeeding in one of two ways. Where sex preferences are strong, mothers may be more anxious to stop child bearing after reaching a target number of the more desired sex than after earlier births (WFS, 1987). Women might in this case use breastfeeding to avoid pregnancy through other means, coincidentally breastfeed the desired 'final' child longer than earlier children (ibid, 1987). In countries where breastfeeding is normally short, deliberately longer breastfeeding of children of one sex is also a possibility. According to the 1987 WFS report in 14 of the countries surveyed girls were found to breastfeed longer and boys in 14.

1.3.3 Maternal Health Care Characteristics

Place of Delivery and Type of Delivery Assistant

Unwittingly, health services frequently contribute to the decline in breast-feeding practices, either by failing to support and encourage mothers to breast-feed or by introducing routines and procedures that interfere with the normal initiation and establishment of breast-feeding (WHO, 1981). Common examples of the latter are separating mothers from their infants at birth, giving infants glucose water by bottle and teat before lactation has been initiated, and routinely encouraging the use of breast milk substitutes Besides, health personnel may have insufficient knowledge about breast-feeding and little experiences in providing appropriate support for mothers, and may be unaware of the main factors that determine whether or not mothers breast-feed and for how long. Besides, promotion of formula and artificial milk is rampant in hospitals and modern clinics. Hence, mothers who gave birth in modern healthcare clinics were found to have shorter breastfeeding duration than those who gave birth at home in Egypt (Abd El Fattah and Eldin, 1993). This relationship was also confirmed in Uganda (Boerma *et al.*, 1991).

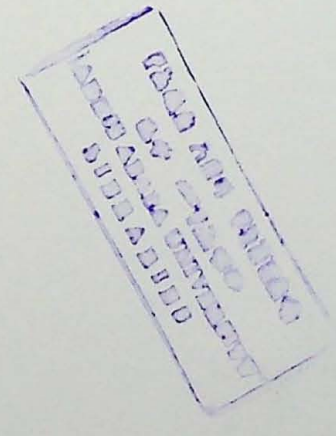
To sum up, as it is discussed in the above review of literature, different studies have examined and identified the various socio-economic, demographic and health care factors, which affect timely initiation, frequency and duration of breast-feeding. Trustell and others (1992) using WFS data from Kenya and Sudan identified education and place of residence of women as the most important

factors that influence the duration of breastfeeding. Benefo (1991) also demonstrated using WFS data from Cameron, Ghana, Ivory Coast and Senegal the importance of these two factors.

In Ethiopia, several studies documented that educational status of women has a negative relationship with frequency and duration of breastfeeding (Daniel, 2001; Tigist *et al*, 1993; Yeshewamebrat, 1995). Other studies also show that age of mothers has a positive and place of residence a negative relationship with duration of breastfeeding (Abdulahi, 1989 and Eshetu, 1994). However, the impact of bottle-feeding practices, maternal health care behaviors (place of delivery and type of assistance at delivery) on early initiation, frequency and duration of breastfeeding in Oromia region have not been examined in detail by the previous studies. Provided that there is no research in the subject especially at regional level.

On the other hand, in the surveys conducted in our country, the (1990 NFFS, 2000 and 2005 EDHS), only bivariate analysis was employed to describe the data collected on breast-feeding. Each variable was independently analyzed in relation to the initiation, frequency and duration of breast-feeding. However, with out a multivariate analysis it is not possible to identify which variables are most important. In Abdulahi's (1989) analysis only the age of mothers who had stopped breast-feeding their last child was analyzed (censored cases were ignored).

The purpose of this study is, therefore, to fill this gap and to identify the most important socio-economic, demographic and health care factors, which affect breast-feeding practices, which is one of the proximate determinants of fertility in the region. Most importantly, undertaking such kind of study in Oromia, a region with the highest fertility and slightly higher infant mortality records in the country may provide valuable information for policies targeting at reversing such tragedies in the region by reducing the barriers of optimal breastfeeding practices and maximizing the benefits of breast-feeding.



1.4. Objectives of the study

The general objective of the study is to identify the key socio-economic, demographic and health care variables, which affect breast-feeding practices (the initiation, frequency and duration of breast-feeding) in Oromia region based on the 2005 EDHS. In light of this, the following are the specific objectives of the study.

1.4.1. Specific objectives

1. To estimate the rate of initiation, frequency and duration of breast-feeding in Oromia Region.
2. To examine the socio-economic, demographic and maternal health care factors which affect the initiation, frequency and duration of breast-feeding.
3. To show the strength of effect of the determinant factors on the dependent variables, i.e., the initiation, frequency and duration of breast-feeding.

1.5. Hypotheses

1. Most educated and working mothers are more likely to practice bottle-feeding hence; breast-feed less intensively and for shorter durations than those with no and/or less education and not working.
2. Mothers living in urban areas and who ever used contraception are less likely to initiate breast-feeding immediately and to breast-feed for shorter duration than rural and those never used.
3. Mothers who gave birth at home and assisted by traditional birth attendants and relatives initiate breastfeeding earlier than those who gave birth in health facilities and assisted by health professionals.
4. Older and higher parity mothers are more likely to initiate breast-feeding immediately, more intensively and for longer durations than younger and lower parity mothers.

1.6. Significance of the study

Breast-feeding has been the subject of rapidly growing interest in developing countries because of its important implications not only for the improved health of children, but also for lowering fertility. In deed, numerous studies documented that breast-feeding is the primary factor affecting the length of birth intervals for 83 percent of couples in developing countries that do not use modern form of contraception (Barry, 1990). In Oromia, this effect has been highlighted by the research undertaken by Jimma and Brown University of USA in may 2002, and documented that prolonged breast-feeding is one of the two most important proximate determinants of fertility in the region, especially in rural areas, where breast-feeding practices are more optimal than in the urban.

This justifies that timely initiation, intensive and prolonged breast-feeding should be promoted and supported. However, policy interventions to promote and support such practices require an understanding of those barriers or determinants, which keep most mothers from doing so. Furthermore, there is little research on determinants of breastfeeding practices in the region in the recent past due to the little attention given to this important subject. In view of the above facts, undertaking this research in Oromia region, where the highest level of fertility and moderately high infant mortality in the country is recorded may have wider policy implications as population variable is become increasingly integrated to development planning processes.

This study may, therefore, contribute to such understanding through identification of variables, which are adversely affecting breast-feeding practices in the region and may provide development policy makers with information useful to guide sustained public health interventions aimed at reducing those barriers which keep mothers from timely initiating, intensively breast-feeding and for longer durations while also, to prioritize resources needed for this purpose. The fact that improving maternal and child health are among the Millennium Development Goal indicators of the country, identification of problems of breastfeeding practices is of paramount importance. In addition, the findings of the study may also helpful to develop programs of education, training and public information designed to improve the little attention given to this important subject. The study may also pave the way for further researches in the area.

1.7 Theoretical and Conceptual framework

1.7.1. Theoretical background

A number of researchers (Tiedje et al, 2002; Solimano, 1992) have considered a variety of theories that have helped to refine our thinking about the range of factors which influence breastfeeding. Solimano (1992) proposed a theoretical framework illustrating the socio-economic and socio-cultural determinants of breast-feeding practices in developing countries on which the current study is based by modifying according to the available data.

The socio-economic factors that have been postulated to be related to the decline in breast-feeding practices include, urbanization, maternal education, nutrition, working patterns, income, health services, knowledge and availability of breast milk substitutes (Tiedje et al, 2002). The socio-cultural environments or factors include the acquisition of western material culture; changes in breastfeeding behavior as affected by modernization, are caused by social, cultural and economic influences on parental attitudes and behaviors in relation to self-images (ibid, 2002). Life-styles are influenced by examples of local elites, advertising, and the procedures of health services. The shift to bottle feeding may be another instance of the acquisition of western material culture. Family members can pressure women in to bottle-feeding or breast-feeding for these reasons as well. Husbands, mothers, and mothers in-law all have been shown to have influences on women's infant feeding practices.

However, although there are several socio-economic and socio-cultural factors that could affect early initiation, frequency and duration of breastfeeding the present study considers only the socio-economic, demographic and health care variables (determinants). The justification to base the analysis on these characteristics of the mother is due to the fact that the available literature in the context of Ethiopia documented that this variables can explain better the variations in breast-feeding practices. Moreover, the 2005, EDHS did not cover such aspects.

1.7.2. Conceptual framework

In the conceptual model (fig.1) it is assumed that age of mother at birth of the child and parity have a direct effect, while maternal education, work status, place of residence, extend their influences through the intervening variables of maternal health care behavior, bottle-feeding and contraceptive use on early initiation, intensity and duration of breast-feeding, which are the out come variables considered in this study.

The independent variables considered are classified as socio-economic and demographic factors. Educational, work status and place of residence of the mother are the socio-economic variables, while demographic factors include maternal age at birth of the child and parity. The intermediate variables included are maternal health care behaviour (place of delivery and delivery assistance), bottle-feeding and contraceptive use. The pathways between the various segments of this framework can operate in both directions.

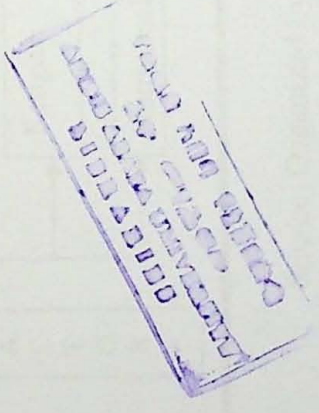
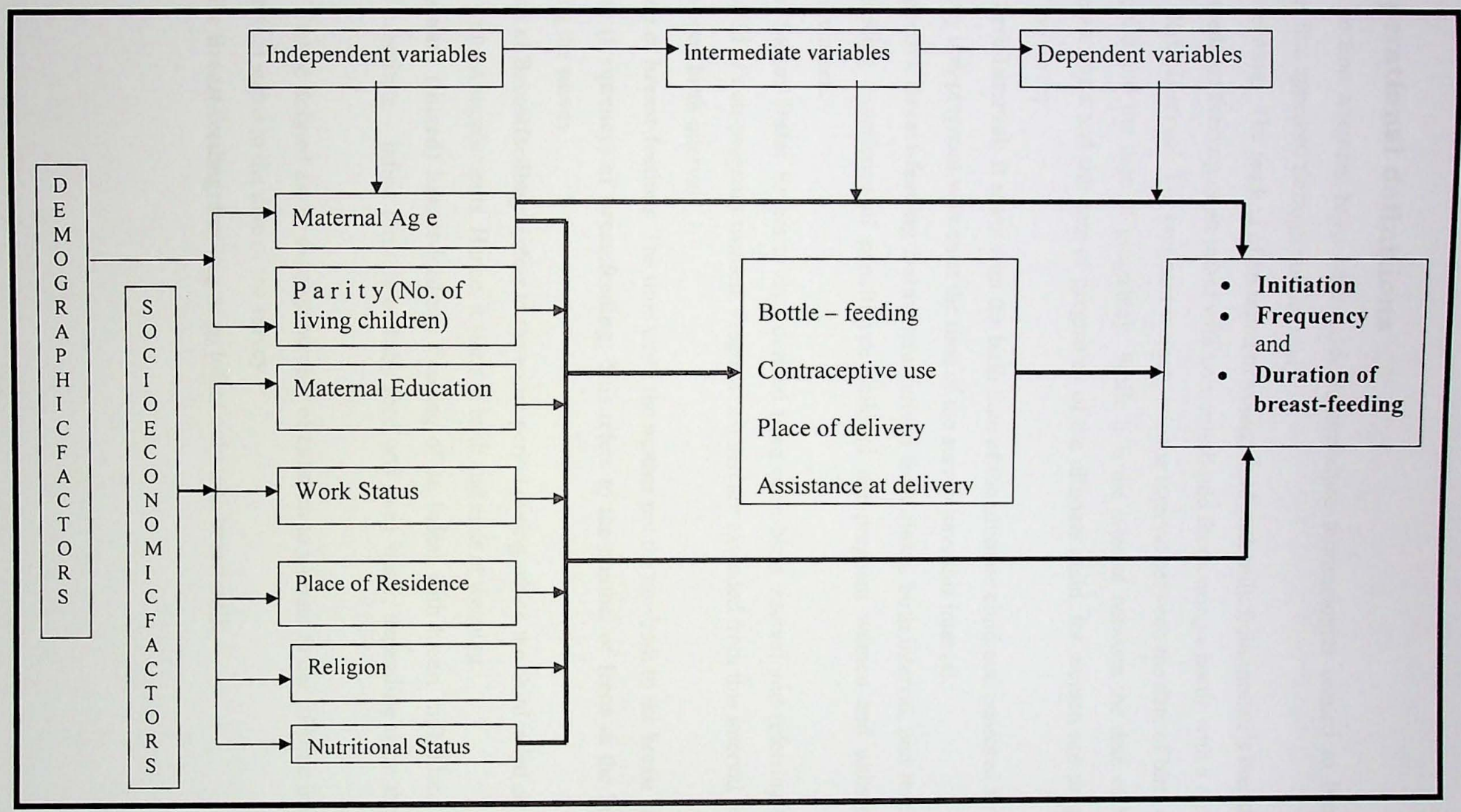


Fig. 1 Conceptual framework of the Determinants of Breastfeeding Practices.



Source: Organized by the researcher from various related literatures, 2008.

1.8. Operational definitions

In this section attempts have been made to introduce terminologies related to breast-feeding practices that appeared through out the study.

Breast-feeding: The feeding of an infant or young child with milk from mother's breasts.

Bottle-feeding: Feeding of an infant with non-milk liquid foods using a bottle with a nipple.

Closed Birth Interval: For pregnant women, it is the interval between the date of birth of the most recent child and the date of pregnancy. While it is the interval between the date of birth of the penultimate child and the date of pregnancy of the ultimate child, for women not pregnant at the time of the survey.

Open Birth Interval: It starts with the birth date of the ultimate child and censored by the survey date. Only non-pregnant women at the time of the survey have this interval.

Retrospective Breast-feeding Data: Data derived from closed birth interval, and referring to the breast-feeding experience of penultimate child of non-pregnant women and ultimate child of pregnant women.

Current Status Data: Refers to data derived from open birth interval and referring to the most recent child of non-pregnant women. Pregnant women are excluded from this interval because they have no open birth interval.

Initiation of breast-feeding: The time when the mother put the newborn to the breast after birth.

Intensity (frequency) of breastfeeding: This refers to the number of feeds in the last 24 hours preceding the survey.

Duration of Breastfeeding: Refers to the entire period during which the child is fed on breast milk with or without supplements. Hence, it starts at birth and ends at weaning.

Predominant (mixed) breast-feeding: Feeding of an infant with breast milk along with some form of substitute – infant formula or baby food and even water, depending upon the age of the child.

Parity: Can be defined as the average number of children to woman in her lifetime irrespective of their survival status to the date of the survey.

Exclusive Breast-feeding: Feeding of an infant only with breast milk.

CHAPTER II
DATA AND METHODOLOGY

2.1. Data Sets

The data source for this study is the 2005 Demographic and Health Survey of Ethiopia carried out by the Central Statistical Agency and Macro International. Moreover, in order to substantiate the findings, primary data collected through in-depth interviews from key informants on selected demographic, socio-economic and health care variables, was used.

A. The 2005 EDHS

The Ethiopian DHS has been collected demographic and health information from a nationally representative sample of women and men in the age group 15-49 and 15-59 respectively. The sample design was made primarily focusing to provide estimates of key population and health indicators, including fertility and mortality rates for the country as a whole, for urban and rural areas separately and for the nine regions and two administrative Councils in the country. The sampling frame was provided by the list of census enumeration areas (EAs) with population and household information from the 1994 census (CSA & ORC Macro, 2005).

Sample selection for the survey was based on a two stage stratified nationally representative sample of households. At the first stage of sampling, 540 EAs, 145 urban and 395 rural, were selected using systematic sampling with probabilities proportional to size. A complete household listing operation was carried out in all the selected EAs to provide sampling frame for the second stage selection of households. Finally, between 24 and 32 households from each cluster were systematically selected for participation in the survey in all regions (ibid, 2005).

In this survey detailed information on different demographic and health issues was collected from a total of 14,070 women. Of the total women covered by the survey 2230 were from Oromia region. However, only ever-married women who gave birth (i.e., 1211) in the last three/five years preceding the survey were considered for this study.

The structured individual women questionnaire gathered relevant information from women aged 15-49 on: fertility, breast-feeding, child health, child mortality and prenatal as well as delivery care services, and knowledge, attitude and practices of family planning services. In the survey, women who had at least one child within the last three/five years before the survey were asked if they ever breast-fed the child, how many months the child was breast-fed, and the timing of initiation of breast-feeding after birth. Those currently breastfeeding were asked how many times they breast-fed the last-born child aged below six months during the last 24 hours (day and night time). These questions provided indicators of the breast-feeding practices examined in the analysis.

B. Primary data from In-depth Interviews of Key informants

An in-depth interview with key informants was considered with the intention that it might generate a supportive qualitative data in the context of the objectives of the study. It was conducted on selected socio-economic, demographic and health care variables that are expected to have a detrimental effect on breast-feeding practices and that are considered in this study. Accordingly, 24 key informant interviews were carried out in one hospital and one health station (comprising of 2 mid-wives and 2 nurses) and from 20 ever-married women who gave birth to at least one child (living) in the age range of 15-49 both from selected urban and rural parts of the region (Ambo, Sebeta and Adama). The interview also involved women with different work and educational (demographic and socio-economic) backgrounds. Moreover, homogeneity among the key informants regarding their experience in breast-feeding was maintained. The principal investigator who used pre-tested interview guides carried out the interviews. In addition, Informed consent was obtained before an in-depth interview was conducted.

2.2. Assessment of Data Quality

2.2.1. Data on Children Ever Born (CEB)

An important demographic data that might encounter error is data on children ever born. The number of children ever born to a woman refers to the number of live births in her lifetime up to the survey date irrespective of their survival status. Mostly the error in the number of children ever born is due to omission. Women usually tend to omit some of their live born children especially if they are dead or not living together. To assess the accuracy of data on children ever born the behavior of average parity is examined. The average parity is expected to increase with the age of

women until it reaches its peak at the end of childbearing age and remains constant then after (UN, 1983).

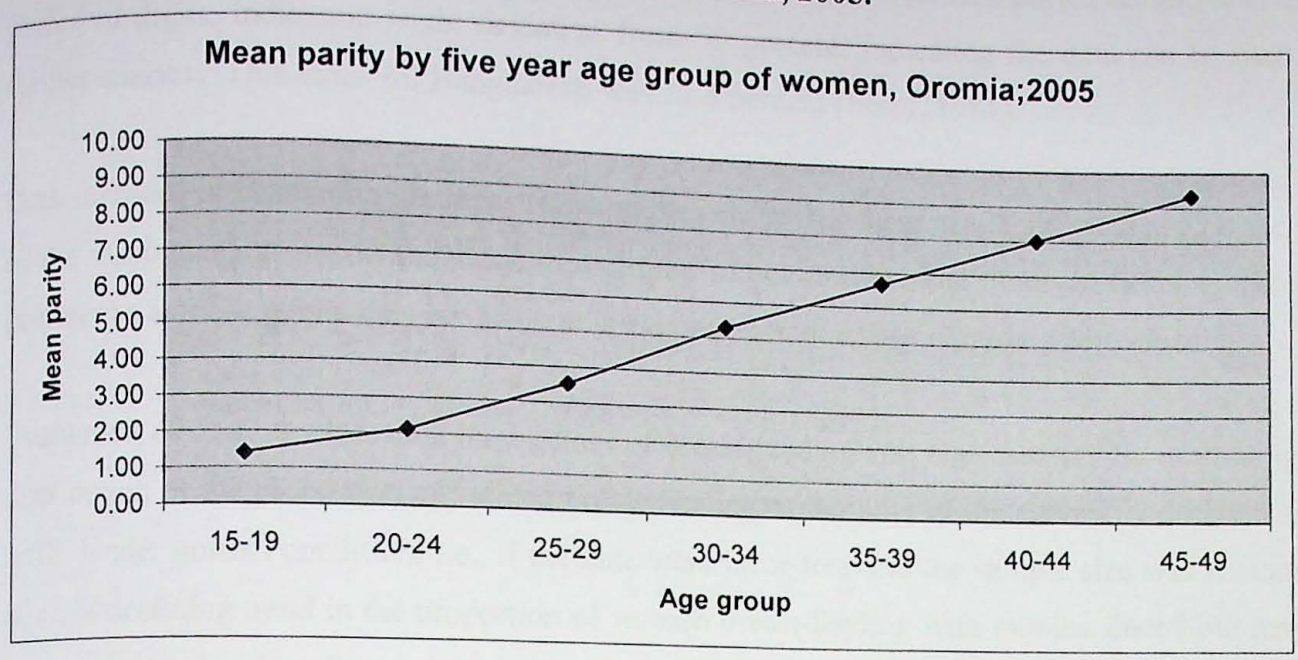
Table 1. Children Ever born to Women by Age Group Oromia, 2005.

Age Group	No of Women	Children Ever Born	Average Parity
15 – 19	81	113	1.40
20 _ 24	244	516	2.11
25 _ 29	317	1118	3.53
30 _ 34	236	1249	5.29
35 _ 39	193	1289	6.68
40 _ 44	87	697	8.01
45 _ 49	53	494	9.32
Total	1211	5476	4.52

Source: The EDHS, 2005.

As it is shown in table.1 and in the graph (fig.2) below, the average parity of the women shows increasing trend with an increasing age of the mother. This indicates that the data on children ever born is accurately reported for Oromia region. Hence, the data can be used for further analysis.

Fig.2. Mean Parity by age Group of Women, Oromia, 2005.



Source: Computed from the Ethiopian DHS, 2005

2.2.2. Data on Breast-feeding

Two types of data are identified on duration of breastfeeding, i.e., from the closed and open birth intervals. Breast-feeding data in the closed birth interval are retrospective in nature. In this case women were asked to recall for how long they had breastfed their weaned children. Of course, in this interval, the beginning and end points of breast-feeding are known and thus estimating the central values (mean and median) are straightforward. However, retrospectively reported data are subject to errors of heaping and rounding on preferred digits usually at multiples of six months (for example, at 12, 24 and 36 months). Accordingly, a slight heaping was observed in the retrospective data. As clearly shown in fig.3, about 5.7 percent of the women reported 12 months duration of breast-feeding, while only 2.9 percent reported duration of 11and 13 months. Similarly, about 11 percent of women reported 24 months of duration, while only 1.0 percent and 2.1 percent reported durations of 23 and 25 months, respectively.

The prevalence of preference may also be examined by calculating the index of heaping. According to Ferry (1981), the index of heaping can be calculated by summing up the percentages corresponding to these preferred values and this index provides a good summary measure of the quality of data and any deviation from 50 percent is considered as digit preference. The index for

these data is found 58 percent indicating that 58 percent of the women reported durations in these preferred digits, indicating slight deviation from 50 percent, indicating the data can be used for further analysis. This index for Bangladesh was 78.4 percent (Ferry, 1981).

Both methods of evaluating the breast-feeding data show that there is a slight tendency on the part of the respondents to report durations in multiples of six months. The observed heaping and digit preference at those points may be due to cultural norms or practices regarding breastfeeding.

Evaluation of current status data on duration of breast-feeding was also assessed by examining the distribution of the proportion of women breast-feeding at the time of the survey by duration since birth. Under normal condition, i.e., if the data were error free and the sample size was reasonably large, a declining trend in the proportion of women breast-feeding with months since birth may be expected. As can be observed in fig.4, the distribution exhibits irregular pattern instead of a declining trend. In the absence of birth certificates the irregularities observed in the data may be attributed to incorrect reporting of birth date on the part of the respondents.

A number of alternative methods of estimation have been devised to over come this problem. One such alternative measure is based on the epidemiological principle in which mean duration of illness is estimated by dividing its prevalence by its incidence (prevalence / incidence). In the application of this method to breast-feeding, prevalence refers to the number of children still breastfeeding at the time of the survey while incidence is the average number of births per month. This ratio (prevalence/incidence) method is employed here to estimate the mean number of months of breast-feeding presented in table 3.5. In the present study, the estimate of incidence (i.e., mean number of births per month is derived from births over last five years to minimize the effect of yearly fluctuations in births. Conclusively, in spite of heaping on the retrospective data and minor irregularities on the current status data, in general, the data are not that bad.

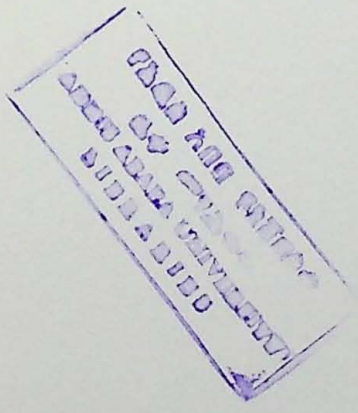


Fig. 3. Breast-feeding Duration in the Closed Birth Interval. Oromia, 2005.

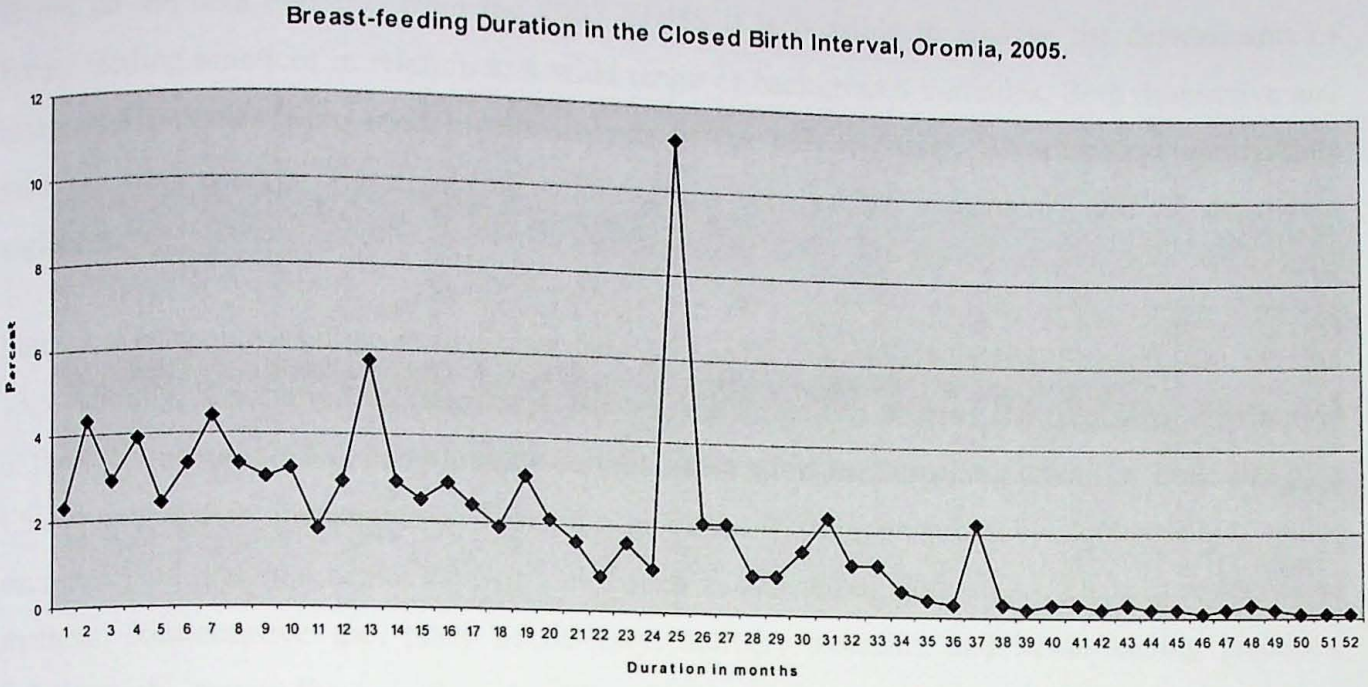
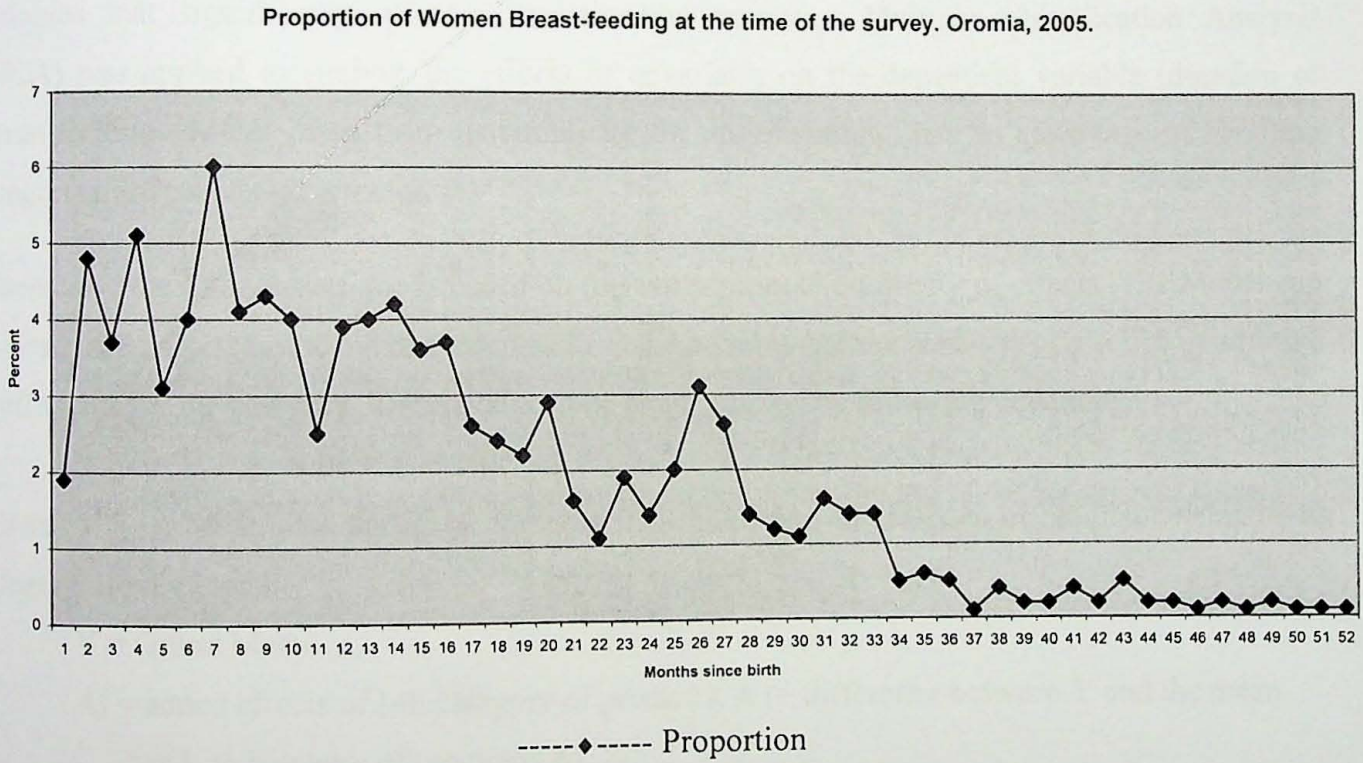


Fig.4. Proportion of Women Breast-feeding at the time of the survey. Oromia, 2005.



2.3. Methods of data analysis

Based on the data obtained from the 2005 EDHS it is possible to analyze the determinants of breast-feeding practices in relation to a wide range of background variables. Both descriptive and inferential statistics were used in the analysis of the current study. Bivariate and multivariate analyses were used to investigate the relationships between the explanatory and the dependent variables.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) software, version 13.5. Initially, descriptive statistical analysis was performed to observe the frequency distribution of the socio-economic and demographic variables that affect breastfeeding practices. Followed by a Chi square test to investigate differentials in breast-feeding practices by demographic, socio-economic and maternal health care variables such as education, work status, place of residence of mothers, contraceptive use, place of delivery, delivery assistant, and bottle-feeding practices. Subsequently, factors that significantly affected breastfeeding practices on univariate and bivariate analysis were entered into a multivariate analysis to measure the strength of the relationship between the independent and dependent variables and to identify the most important independent variables that significantly affected breastfeeding practices. Multiple Classification Analysis (MCA) was applied to analyze the effects of covariates on the dependent variable (duration of breast-feeding). MCA, apart from its simplicity for understanding, has an advantage of handling categorical independent variables.

Essentially, the MCA technique is based on the assumption of additivity of effects. The Model can be described as having the overall mean as its constant term and main effects or a series of additive coefficients for the category. The model can be explained by the following equation:

$$\mathbf{Y}\ ijk = \mathbf{Y} + \mathbf{A}i + \mathbf{B}i + \ldots + eijk$$

Where, $\mathbf{Y}\ ij$ = Mean of a particular variable that falls into i-th category of predictor **A**, and j-th category of predictor B.

Y = Grand Mean

Ai = added effects of I-th category of predictor **A** (= difference between **Y** and the mean of I- th category of predictor **A**).

Bj = added effect of j-th category of predictor **B** (= difference between **Y** and the mean of j-th category of predictor **B**).

The most important feature of MCA is its ability to give the gross and net effects of each predictor on the dependent variable. The gross effect of a particular independent variable or predictor refers to the effect that it will have on the dependent variable before making any allowance for the effects of other predictors, while the net effect refers to the effect of that predictor on the dependent variable after making adjustment for the effects of others. The MCA table also provides Eta (Þ) which indicates the ability of a predictor, using the categories given, to explain variations in the dependent variable: Eta squared ($Þ^2$) which is the correlation ratio indicating the proportion of the total sum of squares explainable by the predictor: Beta and Beta squared (â and $â^2$) which are directly analogous to the Eta statistics, but are based on the adjusted means rather than the raw means, and provide a measure of the ability of the predictor to explain variation in the dependent variable after adjusting for the effects of all other predictors : Multiple correlation coefficient squared (unadjusted for degree of freedom) which indicates the proportion of variance explained by the whole model ;and multiple correlation coefficient squared (R^2 adjusted for degree of freedom) indicating the proportion of variance in the dependent variable explained by all predictors.

Furthermore, two of the dependent variables, (initiation and intensity of breast-feeding) were treated as dichotomous and hence, logistic regression model was used to analyze causal relationships and to identify the most important socio-economic and demographic variables that affect significantly the initiation and intensity of breast-feeding. In cross-sectional studies such as the DHS, it is quite common to use logistic regression model to perform probabilistic estimation, which is based up on the maximum likelihood coefficients predicting the occurrence of the event.

Logistic regression is the most widely applied model when the dependent variable is dichotomous taking values 0 or 1. It is based on the concept of odds ratio: p/(1-p), where p is the probability that the event Y occurs, p (Y=1) and (1-p) is the probability that the event Y does not occur, p (Y=0). The logistic regression model is given by the function f (z) = 1/(1+e-z), where z is the linear combination (z = a + BX + e). Besides, intensity of breastfeeding can be analyzed using this model since the dichotomized frequency are describing whether the mother breastfeed intensively (high) or not (low).

The logit model solves these problems:

$$\ln\frac{p}{(1-p)} = a + BX + e \qquad \frac{p}{(1-p)} = \exp(a = BX = e)$$

Where: **-ln** is the natural logarithm

P is the probability that the event **Y** occurs, **p (Y=1)**

P/(1-p) is the "odds ratio"

ln[p/(1-p)] is the log odds ratio, or logit

For example, in our case p is the probability of initiating breast-feeding immediately or with in an hour of birth, where as 1-p is the probability of not initiating breast-feeding immediately, **a** is the constant term, and **B** is the logistic coefficient which can be interpreted as the change in the log odds associated with a one unit change in the independent variable. Or **exp (B)** is the factor by which the odds change when the independent variable increases by one unit.

2.4. Measurement and Description of Variables

The dependent variables analyzed are the initiation, frequency (intensity) and duration of breast-feeding. In the survey information on frequency of breast-feeding was collected from currently breast-feeding women and for the last birth from responses of "how many times did you breast-fed the infant during the last 24 hours (last night and day time)". The number of times that a women breast-feed during the previous 24 hours were grouped into two categories indicating the levels of intensity of breastfeeding (table 2).

The classification is based on WHO's recommendations that a child must breastfeed at least once every two to three hours (on averege once in two hours) because it helps to keep up the milk supply and to ensure the baby's needs for milk (WHO, 2003). As to the duration of breast-feeding, the in formation was collected for the last birth, next to last and second from last birth from answers of questions "for how many months the mother breast-feed?. However, the analysis is limited to durations of breast-feeding of the last child, which was measured by months. The justification behind the use of data from last birth is that it is more likely to be accurately recalled since it is the

most recent event. The categorization is presented in table 2. The unit of analysis for the current study, is therefore, mothers who gave births in the last three/five years preceding the survey, breast-feed their last child and whose children survived till the time of the survey.

Table 2. Variable Description (Specification)

Variables	Response categories
Place of Residence	1 = Urban, 2 = Rural
Age of mothers	1= 15 –24, 2= 25 - 34, 3 = 35 – 49
Parity	1= 1 – 2 Children 2= 3 – 5 Children 3= 6 or more
Educational level of the mother	1= No education 2= Primary education 3= Secondary and above
Work status of the mother	1 = Not Working 2 = Working
Religion	1 = Christian @ 2 = Muslim 3 = Traditional
Contraceptive use	1 = Never used 2 = Ever used
Practice of Bottle-feeding	1 = No 2 = Yes
Place of delivery	1= Home 2= Health facility
Type of Assistance at delivery	1= Health Professional 2= Trained TBA* 3= Un trained TBA 4= Relative 5= No one
Initiation of breast-feeding	1 = Immediately (<= 1 hour) 2 = Not immediately (> 1 hour)
Intensity (Frequency) of breast-feeding	1 = Low = < 12 times 2 = High = > 12 times (on demand)
Duration of breast-feeding (months)	1= 0 – 6, 2= 7 – 12, 3= 13 – 18 months 4 = 19 -24, 5 = > 24 months

*TBA= Traditional Birth Attendant, @= contains Orthodox, Protestant and Catholic.

2.5. Limitations of the study

The major limitations of the study include:

1. Important variables that are believed to affect breastfeeding practices such as, mother's knowledge and attitude towards breast-feeding are not included in the DHS data on which the present study is based. Nonetheless, we believe that the analysis incorporate a wide range of socio-economic and demographic variables from the EDHS, 2005 to address sufficiently the problem of breast-feeding practices in the study area.

2. Unlike the 2000 EDHS, the 2005 EDHS data did not incorporate information on reasons for discontinuation of breast-fed for those ever-married and ever breastfed women. Hence, explanations in this context are not considered in the study. However, an attempt was made to incorporate information obtained from key informant interviews.

CHAPTER III
BACKGROUND CHARACTRISTICS OF THE STUDY AREA AND POPULATION

3.1. The Study Area

The regional state of Oromia lies in the central part of Ethiopia with larger protrusions towards the south and west directions. It is the largest of eleven regional states of Ethiopia and has vast area of fertile land, large number of domestic animals, mineral deposits and wild life. The region is relatively diverse in terms of ecological, religious, economic and socio-cultural composition (OESPO, 2000).

As the largest regional state in Ethiopia, Oromia accounts for about 30 percent of the country's total population (CSA, 1999). According to the population projection by the Central Statistical Authority, the population of the region is estimated to be 25.8 million in 2005 divided in about equal proportion between males and females. The total population is expected to grow by about 3.1 percent per year. The economically active population is estimated to be 81 percent of the 15 - 64 age group. The average life expectancy at birth is 50.4 years (OESPO, 1999).

Only 10 percent of the population of Oromia lives in urban areas while the remaining 90 percent reside in rural parts of the region. In terms of education less than a quarter (22 percent) of the population age 10 years and above is literate. Female literacy is particularly low (only 15 percent) of women age 10 and above could read and write (CSA, 1999). The gross enrolment ratio at the primary level is 39.6 percent (which is lower than the national average of 41.8 percent) and of this, female participation is only 22.6 percent. Secondary level enrolment rate, however, declines to 7.5 percent. With regard to the gender disparity, males and females contribute 8.6 and 5.1 percent respectively. Male participation is invariably higher than females in all zones of the region (OESPO, 1999)

The 1994 census estimated a total fertility rate of 7.3 for Oromia region, whereas the total fertility rate in the 2000 and 2005 EDHS is found to be 6.4 and 6.2, respectively. This suggests a recent decline in fertility by about one child per woman. In spite of a modest decline, fertility in Oromia still remains higher than the national figure, which is estimated at 5.4 children per woman (CSA & ORC Macro, 2005).

The health service coverage of the region is estimated to be 46.3 percent. According to the Ethiopian 2005 DHS infant and under five mortality are estimated to be 76 and 122 per 1000 live births respectively, which is very close to the national average (CSA & ORC Macro, 2005). Acute respiratory infections are the major causes of morbidity in children under five in Oromia (OESPO, 1999).

According to the 2005 EDHS, the coverage of antenatal, delivery and postnatal care for women who had a live birth in the past five years preceding the survey was low that only 24. 8, 0.2 and 0.4 percent received antenatal care from health professional trained and untrained traditional birth attendants respectively, while the majorities (74.5 percent) were not served by either of the above. Moreover, significant variations have been observed mainly across rural-urban settings and by other background characteristics (such as by education) of the women in receiving the above services. Children born in urban areas are 20 times more likely to be delivered in a health facility than children born in rural areas (ibid, 2005).

Contraceptive use in the Oromia region is below the national level. Among currently married women of age 15-49 in the region 16 percent were using modern contraceptive method in 2005 (CSA & ORC Macro, 2005). Rural-urban differences in contraceptive use are striking that about 36 percent of currently married women in urban areas of the region ever use contraception, compared to only about 13 percent of their rural counter parts.

3.2. Characteristics of the study population

In this study various socioeconomic and demographic characteristics of women that are expected to have association with breast-feeding practices are considered. As already mentioned, currently married women in their reproductive age group (15-49) and who had given at least one live birth at the time of the survey were considered as eligible. Accordingly, 1211 currently married women were selected. This chapter deals with the proportion and distribution of women under the study across their background characteristics. Table 3.1 presents the number of cases and their percentage distribution.

Women's place of residence is categorized as rural and urban in which only 6.6 percent are found to be urban residents while the rest (93.4 percent) are living in rural areas. As to the distribution of women by age a greater proportion (45.7 percent) are in the age group of 25-34, while 27.5 and 26.8 percent are found in the age groups of 35-49 and 15-24, respectively.

Women's parity is classified in to three groups as those women who have 1-2 children comprising 28.7 percent, 37.9 percent are those with 3-5 children and 33.4 percent are those with six and more children. Maternal education is one of the socioeconomic variables considered in the study. It is classified into three categories as those with no education, primary, and secondary and higher education. The percentage distribution of women according to their educational level is presented in table 3.1 greater majority about 76 percent of the eligible women are not educated, 19.2 percent are having primary education while the remaining 4.3 percent are with secondary and above education.

Work status of mothers indicates women who are engaged in work activity outside the home. For the purpose of this study, it is classified as working and non-working group. As presented in table 3.1, the distribution of women according to their work status is 29.7 percent and 70.3 percent for those working and not working respectively. The percentage distribution of women across the working and non-working categories is not proportional. The percentage distribution of mothers by bottle-feeding shows that 84.5 percent are using bottles to feed their children while the remaining 15.5 are not practicing bottle-feeding.

Table 3.1 Percentage Distributions of Eligible Women by Selected Demographic, Socio-economic and Health Care Characteristics, Oromia, 2005.

Socio-economic Characteristics		*Number of Women*	*Percentages*
Place of Residence	Urban	80	6.6
	Rural	1131	93.4
Maternal Education	No education	926	76.5
	Primary	233	19.2
	Secondary +	52	4.3
Work Status:	Working	360	29.7
	Not Working	851	70.3
Contraceptive Use	Ever used	270	22.3
	Never used	941	77.7
Bottle-feeding Practice	No	958	84.5
	Yes	176	15.5
Religion	Christian	547	45.2
	Muslim	622	51.4
	Traditional	42	3.5
Demographic Characteristics			
Maternal Age	15 – 24	325	26.8
	25 – 34	553	45.7
	35 – 49	333	27.5
Parity	1- 2 Children	347	28.7
	3 – 5 Children	459	37.9
	6 and more	405	33.4
Sex of the Child	Male	608	50.2
	Female	603	49.8
Health Care Characteristics			
Place of Delivery	Home	1102	91.1
	Health Facilities	107	8.9
Assistance at Delivery:*	Health Professional	74	6.1
	TTBA	53	8.7
	UTTBA	276	22.8
	Relative	853	70.3
	No one	62	5.1

- * = Computed from multiple responses, TBA = Trained Traditional Birth Attendant
- Source: EDHS, 2005.

The percentage distribution of mothers by place of delivery (table.3.1) shows that majority of the births (about 90 percent) were delivered at home while only about 9 percent at health facilities. Most of the mothers (70 percent) assisted at delivery by their relatives, 22 percent by untrained traditional birth attendants, and 8.7 percent by trained traditional birth attendants and 6.1 percent by health professionals while no one assisted the remaining 5.1 percent. The proportion of women who use any form of contraception in the study population are 22.3 percent while more than three fourth (about 78 percent) of them are non-users.

Data on the religious affiliation of women in Oromia shows that about 45 percent of them are Christians, 51.4 percent are Muslims while the remaining 3.5 percent are followers of traditional or other beliefs (table 3.1).

3.3. Breast-feeding Practices

3.3.1. Initiation of Breast-feeding

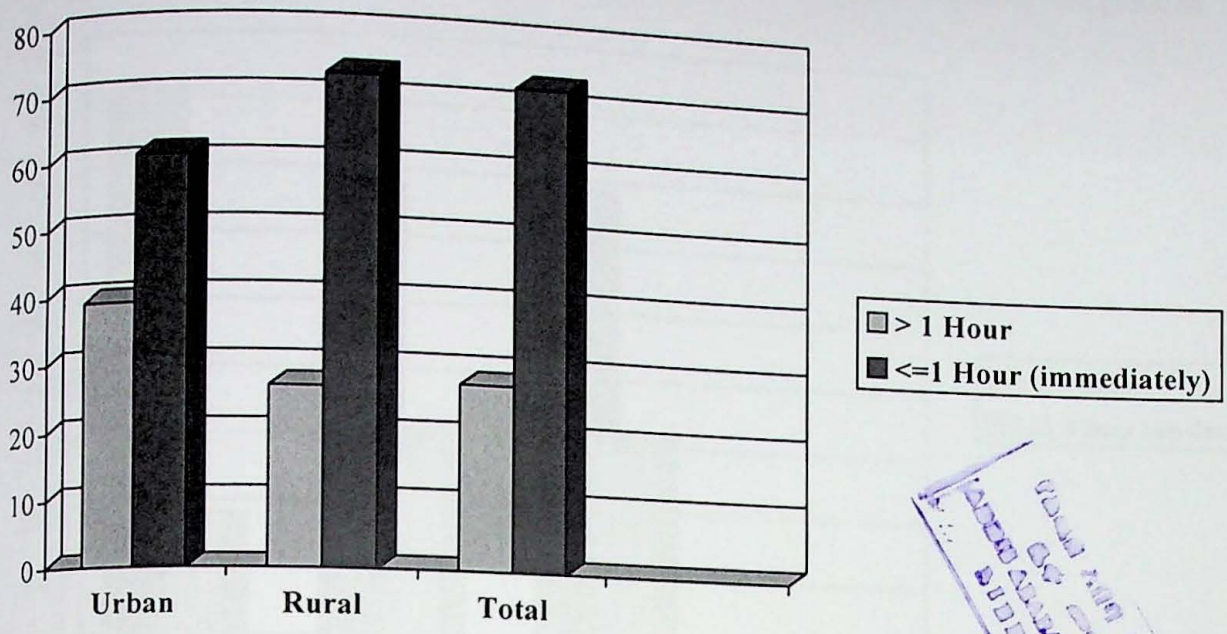
As clearly indicated in table 3.2, among women who gave birth in the last five years preceding the survey, about 72 percent of women in Oromia region initiate breast-feeding immediately (with in an hour after birth), while 27.6 percent initiate breast-feeding latter than an hour after birth. The percentage of mothers who initiate breastfeeding across rural-urban settings show that about 73 percent of rural and 61 percent of urban women initiate breastfeeding immediately.

Table 3.2 Percentage Distribution of women by timing of initial breast-feeding, Oromia, 2005.

Place of Residence	*Timing of Initial Breast-feeding*				*Total*
	<=1 hour		*>1 hour*		
	Number	Percent	*Number*	Percent	
Urban	47	61.0	30	39.0	77 (100%)
Rural	796	73.2	292	26.8	1088(100)
Total	843	72.4	322	27.6	1165(100)

Source: EDHS, 2005.

Fig. 5. Percentage distribution of mothers by Timing of initial breast-feeding and by place of residence, Oromia, 2005.



3.3.2. Intensity (frequency of) Breast-feeding

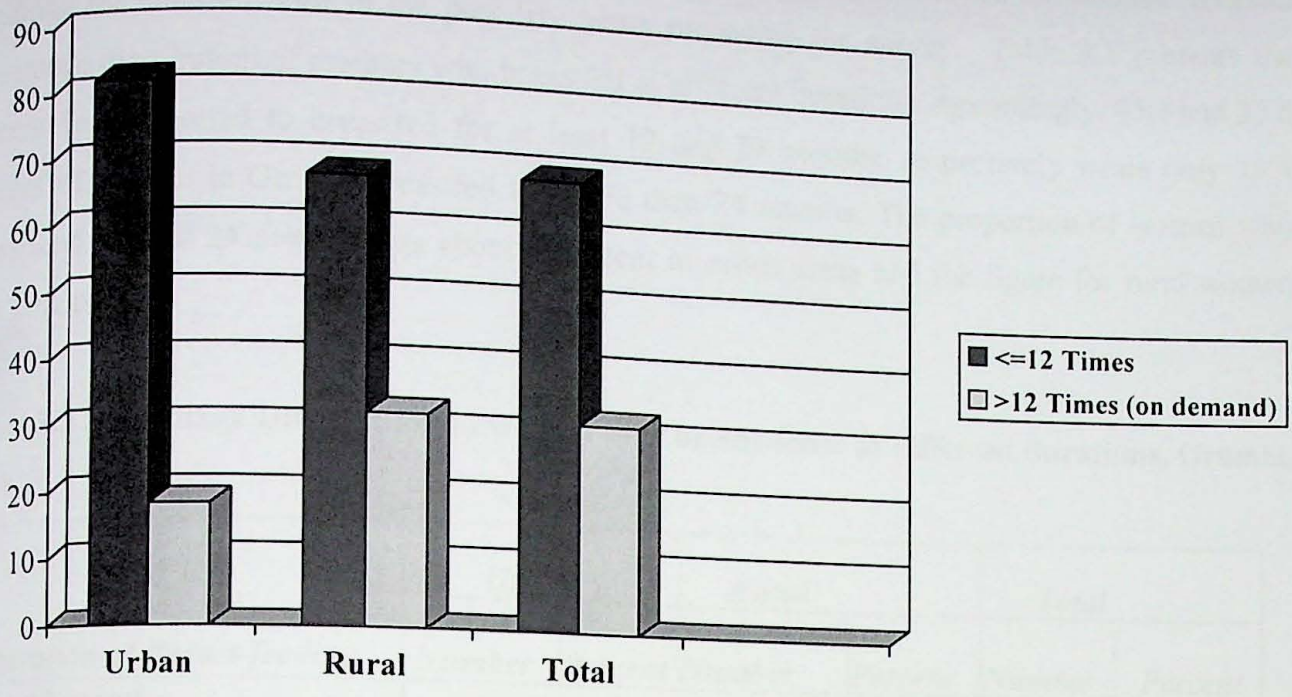
The percentage distribution of mothers by frequency (number of breast-feeds in the preceding 24 hours among women currently breast-feeding their last child born in the last three years preceding the survey and living with them) of breastfeeding is presented in table 3.3 and fig.6. Only 31.5 percent of women in Oromia breast-feed their babies up on demand (>12 times) while the majority (68.5 percent) did not. In addition, the distribution across rural-urban areas shows that about 32 percent of rural mothers breastfeed on demand while only 18.2 percent of urban mothers did so.

Table 3.3 Intensity (Frequency) of Breastfeeding in Oromia, 2005.

Place of Residence	*Number of breast-feeds in the preceding 24 hours*				*Total*
	<=12 times		*>12 times (on demand*		
	Number	Percent	*Number*	Percent	
Urban	27	81.8	6	18.2	33
Rural	517	67.9	244	32.1	761
Total	544	68.5	250	31.5	794

Source: EDHS, 2005

Fig. 6. Percentage Distribution of mothers by Intensity of Breast-feeding and place of residence, Oromia, 2005.



3.3.3. Prevalence and Duration of Breast-feeding

A) Prevalence of breast-feeding

Prevalence of breast-feeding may be defined as the proportion of women who ever-breast-feed irrespective of the duration. Prevalence based on all births for both urban and rural found to be 96.3 percent (table 3.4). Accordingly, as breast-feeding in Oromia is universal the prevalence (proportion of women ever -breastfeed) in urban and rural areas is more or less similar. Despite this, as presented in table 3.5, most urban women discontinue breastfeeding beyond two years.

Table 3.4 Prevalence of breast-feeding by place of residence, Oromia, 2005.

	Prevalence of Breast-feeding					
	Ever breast-fed		Never breast-fed		Total	
Place of residence	Number	Percent	Number	Percent	Number	Percent
Urban	Urban	77	96.3	3	3.8	80
Rural	Rural	1085	96.3	42	3.7	1127
Total	Total	1162	96.3	45	3.7	1207

Source: EDHS, 2005

B) Proportion of women breast-feed at different durations

The proportion of women breastfeed at different duration is computed based on mothers' recalled durations for children born in the past five years preceding the survey. Table 3.5 presents the percentage distribution of mothers who breastfed at different durations. Accordingly, 45.1 and 35.6 percent have reported to breastfed for at least 12 and 24 months, respectively while only 19.4 percent of women in Oromia breastfed for more than 24 months. The proportion of women who breastfeed beyond 24 months was about 9 percent in urban areas and the figure for rural women was 20.1 percent.

Table 3.5 Percentage Distribution of women ever breast-feeds at different durations, Oromia, 2005.

	Urban		*Rural*		*Total*	
Duration of Breast-feeding	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
0 – 12 months	33	42.9	488	45.2	521	45.1
13 – 24 months	37	48.1	374	34.7	411	35.6
> 24 months	7	9.1	217	20.1	224	19.4
Total	77	100	1079	100	1156	100
Mean duration of breastfeeding	20.8		24.0		24.2	

Source: EDHS, 2005.

As stated earlier the estimate of duration of breast-feeding is based on the prevalence/incidence technique. This ratio method is employed here to estimate the mean number of months of breast-feeding, which is presented in table 3.5. Accordingly, the mean duration of breast-feeding was 24.2 months for the region, while it is 20.8 months for urban and 24 months for rural women.

CHAPTER IV

DIFFERENTIALS OF BREAST-FEEDING PRACTICES

In order to examine the impact of the different socioeconomic, demographic and health care variables on breast-feeding practices, it is important to first see the differentials in breast-feeding practices across these determinant variables. This chapter, therefore, tries to show the variations in breast-feeding practices among women in Oromia region who gave birth at least one child in the last five years preceding the survey, EDHS, 2005 with respect to the background variables. The breast-feeding practices examined are those associated with international breastfeeding recommendations and indicators, and encompass the timing of initial breastfeeding, intensity (frequency) and duration of breast-feeding. For this purpose bivariate analysis (Chi-square test) was used while the multivariate analysis was carried out using the well known logistic regression and Multiple Classification Analysis techniques.

4.1. Bivariate Analysis Results

4.1.1 Bivariate Analysis of the Differentials in Timing of Initial Breast-feeding.

International recommendations advise that infants should be put to the breast immediately (with in an hour) after birth not only to stimulate the suckling reflex but also to begin the process of boding with the mother, to help the mother's uterus begin to retract and, most importantly, to provide the child with colustrum (WHO and UNICEF, 2002). This section examines the differentials in rates and timings of initial breastfeeding after birth in the context of the optimal practices recommended according to demographic, socio-economic and health care variables.

4.1.1.1 Demographic Differentials in Timing of Initial Breast-feeding.

a) Maternal Age

In this study mother's age at the birth of the child is categorized in to three, 15-24, 25-34 and 35-49. Table 4.1 shows the percentage distribution of women by timing of initial breast-feeding for children born in the five years preceding the survey by Demographic characteristics. The data clearly demonstrated that higher rates of immediate breastfeeding were observed among older mothers in the age group of 35-49 and 25-34 (76.7 and 72.7 percent), respectively than younger mothers (67.3 percent). Moreover, a significant association ($x^2 = 7.105$ and $P<0.05$) between the

timing of initial breast-feeding by age of the mother was observed. The tendency for younger mothers to breastfeed immediately less often than older may reflect their less experience in breastfeeding relative to older mothers, as their children are more likely to be the firstborn children and may have more difficulty managing lactation problems.

b) Parity

Examination of differentials in the timing of initial breast-feeding across parity has more or less similar pattern to that observed for maternal age. Parity has shown a significant association with timing of initial breast-feeding (x^2= 7.548 and P<0.05). As indicated in table 4.1, higher parity mothers (with 6 or more children) initiate breast-feeding earlier (75.3 percent) than lower parity mothers (with 3-5 and 1-2 children) with rates of (72.5 % and 65.3 %), respectively. The explanation for this variation is almost similar to that given for maternal age.

c) Sex of the Child

The data in table 4.1 shows a slight difference in the timing of initial breast-feeding by sex of the child. Mothers who gave birth to female children initiate breast-feeding immediately slightly more than mothers of male children (73.4 Vs 71.4 percent). However, the difference is not statistically significant (x^2= 1.278 and P>0.05).

In summary, the findings in table 4.1 clearly showed that timing of initial breastfeeding is significantly associated with age of the mother and parity. But sex of the child did not show a significant association. Accordingly, older and higher parity mothers initiate breastfeeding immediately more often than youngest and lower parity mothers. The possible explanation for this was given in the respective sections.

Table 4.1 Timing of Initial Breast-feeding by Demographic Characteristics of Women.

Demographic Variables	*Timing of Initial Breast-feeding*			*Chi-square*	*P-Value*
	<=1 hour	*>1 hour*			
Maternal Age	Percent	Percent	*Total*	7.105*	P<0.05
15 - 24	67.3	32.7	315 (100 %)	(2 df)	
25 - 34	72.7	27.3	532 (100 %)		
35 - 49	76.7	23.3	318 (100 %)		
Total	72.4	27.6	1165 (100 %)		
Parity				7.548*	P<0.05
1 – 2 Children	65.3	34.7	173 (100 %)	(2 df)	
3 – 5 Children	72.5	27.5	603 (100 %)		
6+ Children	75.3	24.7	389 (100 %)		
Total	72.4	27.6	1165 (100 %)		
Sex of the Child				1.278	P>0.05
Male	71.4	28.6	587 (100 %)	(1 df)	
Female	73.4	26.6	578 (100 %)		
Total	72.4	23.3	1165 (100 %)		

*** = P < 0.001, **= P < 0.01*= P <0.05, Source: EDHS, 2005.

4.1.1.2 Socio-economic Differentials in the Timing of Initial Breast-feeding

a) Place of Residence

Table 4.2 shows the percentage distribution of women by timing of initial breast-feeding for children born in the five years preceding the survey by socio-economic variables. Accordingly, the differences in timing of initial breast-feeding between urban and rural areas are clearly observed. Most rural mothers (73.2 percent) put the child to breast earlier than their urban counterparts (61 percent). This variation is also found to be statistically significant (x^2= 5.284 and P <0.05). The effect of place of residence on timing of initial breastfeeding can be explained by the fact that urban women are more educated and are more likely to deliver in health facilities (hospitals/clinics) and attended by health professionals, which unwittingly, discourage early initiation of breastfeeding.

b) Maternal Education

Table 4.2 shows the differences in timing of initial breastfeeding by mother's level of education. Accordingly, one can clearly observe that there is a pattern of decline in immediate initiation with increasing educational level that most mothers with no education (73.6 percent) were found to initiate breastfeeding immediately compared to mothers with primary (71 percent) and secondary level of education (60 percent), though the difference is slight between mothers with no education and primary level of education. This association is also significant at (x^2= 6.973 and P < 0.05). The finding lends clear support to the study hypothesis and to the widely recognized association between increased education and reduced breastfeeding practices. It is usually hypothesized that formal schooling blocks the transfer or assimilation of traditional norms, values and beliefs. Mothers with lower educational level are still conservative; sticking more to the traditional systems, hence initiate breast-feeding earlier and more often than mothers with higher educational level and rational ideas. Moreover, educated mothers are more likely to deliver in health facilities and assisted by health professionals, behaviors or practices that are known to affect early initiation of breastfeeding.

c) Work Status of mothers

Examination of the differentials in timing of initial breastfeeding by mother's work status (table 4.2) shows that non-working mothers initiate breastfeeding immediately slightly more (73.6 percent) than working mothers (69.5). However, the difference was not statistically significant (x^2= 1.974 and P>0.05).

d) Ever use of Contraception

As it is evident in the table (4.2), mothers who never used contraception (74.4 percent) are more likely to initiate breastfeeding with in an hour of birth than those ever used (65 percent). The Chi-square result also confirmed the significant association that exists between contraceptive use and timing of initial breastfeeding (x^2= 8.89 and $P < 0.001$). This is due to the fact that most of contraceptive users (71 percent) are urban, educated women and are more likely to give birth in health facilities, where the unintentional procedures of hospital practices discourage appropriate and timely initiation of breast-feeding (WHO, 1981).

Fig. 7. Initial Breast Feeding by Contraceptive Use.

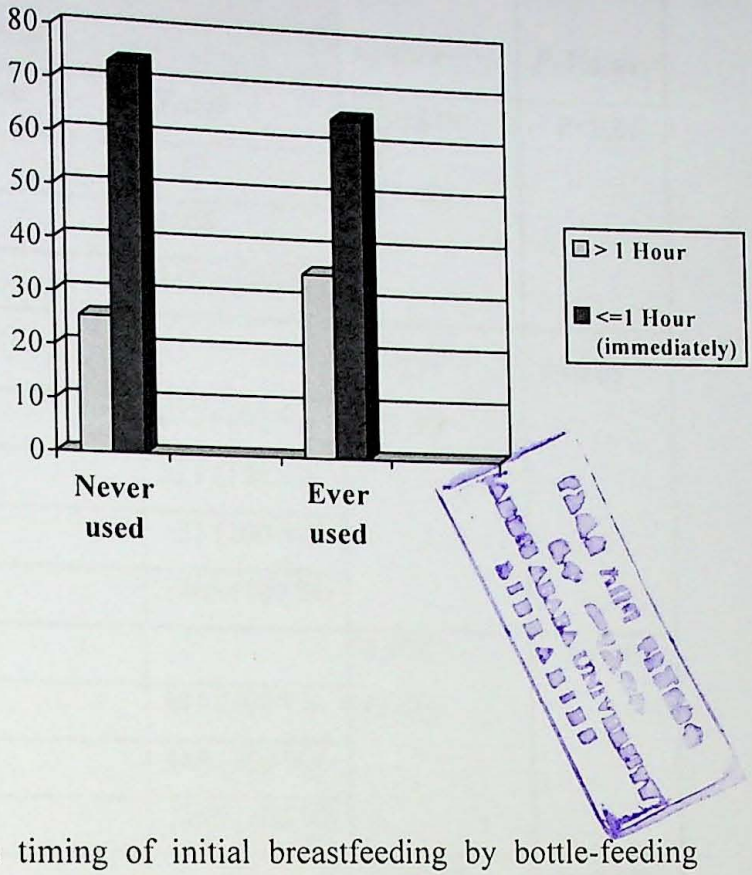


Table 4.2 further demonstrates differentials in timing of initial breastfeeding by bottle-feeding practices of the mother. Accordingly, there were almost no differences in timing of initial breastfeeding by bottle-feeding practice, despite mothers who never used bottles initiate breastfeeding immediately slightly more than those who used bottles to feed the new born (72.7 Vs 71.7 percent). This insignificant association was also supported by the Chi-square value (x^2= 0.181 and $P>0.05$).

In general, examination of differentials in early initiation of breastfeeding by socio-economic variables shows place of residence, maternal education and contraceptive use were significantly associated with early initiation of breastfeeding. But, maternal work status and bottle-feeding did not show significant association. Mothers with no and primary education, who never used contraception and living in rural areas were found to initiate breastfeeding immediately after birth than urban mothers, with better education and who used contraception.

Table 4.2 Timing of Initial Breast-feeding and by Socio-economic Characteristics of Women.

Socio-economic Variables	*Timing of Initial Breast-feeding*			*Chi-square*	*P-Value*
	<=1 hour	*>1 hour*			
Place of Residence	Percent	*Percent*	*Total*	5.284*	P<0.05
Urban	61.0	39.0	77	(1 df)	
Rural	73.2	26.8	1088		
Total	72.4	27.6	1165 (100 %)		
Maternal Education				6.973*	P<0.05
No Education	73.6	26.4	893 (100 %)	(2 df)	
Primary	71.0	29.0	221 (100 %)		
Secondary +	56.9	43.1	51 (100 %)		
Total	72.4	27.6	1165 (100 %)		
Work Status				1.974	P>0.05
Not Working	73.6	26.4	817 (100 %)	(1 df)	
Working	69.5	30.5	348 (100 %)		
Total	72.4	27.6	1165 (100 %)		
Contraceptive Use				8.89***	P<0.001
Never Used	74.4	25.6	911 (100 %)	(1 df)	
Ever Used	65.0	35.0	254 (100 %)		
Total	72.4	27.6	1165 (100 %)		
Bottle-feeding practices				0.181	P>0.05
No	72.7	27.3	944 (100 %)	(1 df)	
Yes	71.7	28.9	221 (100 %)		
Total	72.4	27.6	1165 (100 %)		

*** = P < 0.001, **= P < 0.01*= P <0.05, Source: EDHS, 2005.

4.1.1.3 Differentials in Timing of Initial Breast-feeding by Health Care Variables.

a) Place of Delivery and Type of Birth Attendant

Table 4.3 shows the percentage distribution of mothers by place of delivery and type of delivery assistant. Examination of differentials in timing of initial breastfeeding by place of delivery reveals that mothers who deliver at their home are more likely to initiate breastfeeding immediately after birth (73.1 percent) than women who delivered in health facilities (64.1 percent). This differential is also significant at (x^2= 3.85 and P<0.05). This variation is explained by the fact that most of the mothers who gave birth in health facilities and attended by health professionals (Doctors, Mid-wives or Nurses) are among the higher socio-economic, higher educated and urban strata hence tend to be influenced by factors that work against immediate breast-feeding, such as separation of the infant from the mother for several hours. Provided that bottle-feeding is rampant in hospitals or clinics (WHO, 2001). According to interviews with mothers who delivered in health facilities they report that new-borns are separated for at least 3-4 hours and could not breastfeed immediately. Moreover, according to the interviews with nurses, mothers who delivered by caesarian section (minor surgery) may not start breast-feeding to at least 6-24 hours. But most vaginally delivered mothers roomed-in (be with the newborn) after 30 minutes – 12 hours. This delay is a result of the practice of not rooming-in babies before they get vaccinations and bathing. This delay in rooming-in of babies with his mother and hence the resulting delay in early initiation of breastfeeding become serious for mothers who delivered at night, by caesarian section and for those who gave birth for the first time.

Table 4.3 also shows differences in timing of initial breastfeeding according to the type of birth attendant. Those mothers who were attended by health professionals (Doctors, Midwiferies or Nurses) were less likely (47.4 percent) to breastfed immediately than those not attended by health professionals (74.5 percent). The Chi-Square result in table 4.3 also confirms the presence of significant association (x^2= 6.96 and P<0.01). Moreover, mothers who were assisted by their relatives have shown to breastfeed immediately than not (79.1 Vs 74.5 percent) though the association is insignificant (x^2= 2.76 and P > 0.05). However, a slight difference was observed in immediate breastfeeding between mothers who were assisted by trained (TBA) and not assisted by TBA (77.9 Vs 75.9 percent). The bivariate analysis also did not depict any significant association

(x^2= 0.167 and P> 0.05). Similarly, less variation was also observed in timing of initial breastfeeding between women who were assisted by untrained traditional birth attendants (UTBA) and those not assisted by UTBA's (78.6 Vs 77.8 percent). The association is also not statistically significant (x^2= 1.256 and P>0.05).

In summary, among the health care variables considered in the bivariate analysis, place of delivery and professional assistance at delivery are found to be significantly associated with timing of initial breastfeeding, which is consistent with the study hypothesis that mothers who gave births in health facilities and assisted by health professionals were less likely to initiate breastfeeding immediately than those who gave birth at home and assisted not by health professionals. However, delivery assistance by trained and untrained birth attendants and relatives did not show any significant association with timing of initial breastfeeding.

Fig. 8 Timing of Initial Breast-feeding by Type of Assistance at Delivery, Oromia, 2005.

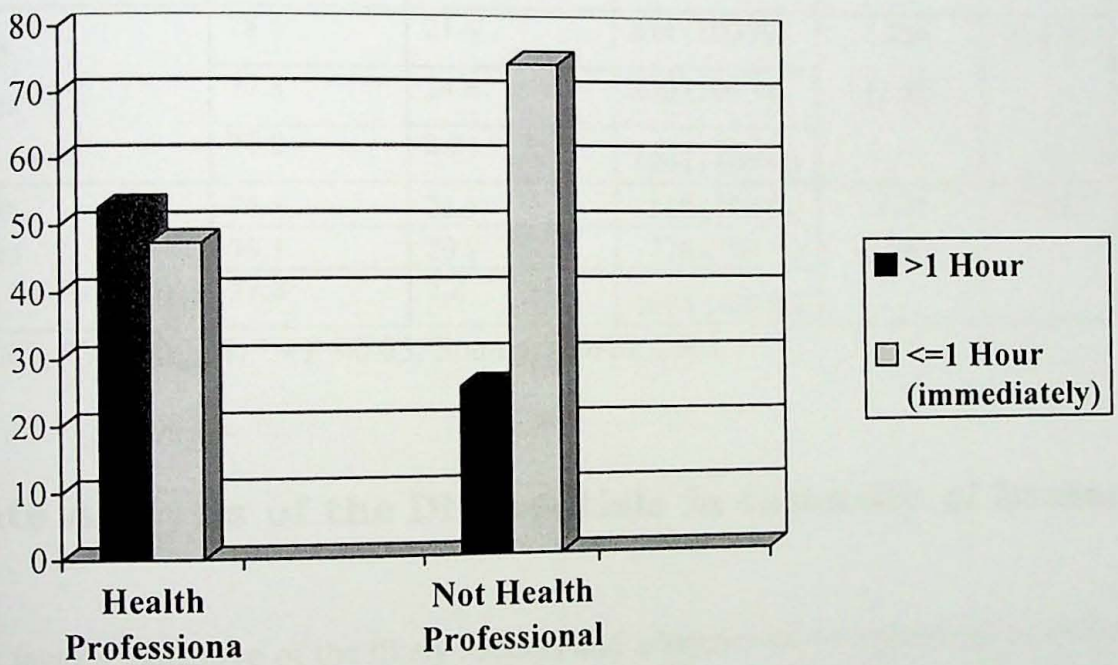


Table 4.3 Timing of Initial Breast-feeding by Health Care Characteristics of the mother.

Health Care Variables	*Timing of Initial Breast-feeding*			*Chi-square*	*P-Value*
	<=1 hour	*>1 hour*			
Place of Delivery	**Percent**	**Percent**	*Total*	3.85*	P<0.05
Home	73.1	26.9	1061 (100 %)	(1 df)	
Health facilities	64.1	35.9	103 (100 %)		
Total	72.3	27.7	1164 (100 %)		
Type of Delivery Attendant					
Health Professional: No	74.5	25.5	572 (100 %)	6.96**	P<0.01
Yes	47.4	52.6	19 (100 %)	(1 df)	
Total	73.6	26.4	591 (100 %)		
TTBA: No	77.9	22.1	815 (100 %)	0.167	P>0.05
Yes	75.9	24.1	79 (100 %)	(1 df)	
Total	77.8	2.2	894 (100 %)		
UTTBA: No	78.6	21.4	844 (100 %)	1.256	P>0.05
Yes	77.8	24.8	250 (100 %)	(1 df)	
Total	77.8	2.2	1094 (100 %)		
Relative: No	74.5	25.5	318 (100 %)	2.76	P>0.05
Yes	79.1	20.9	776 (100 %)	(1df)	
Total	77.8	2.2	1094 (100 %)		

*** = P < 0.001, **=P < 0.01, *= P <0.05, Source: EDHS, 2005.

4.2. Bivariate Analysis of the Differentials in Intensity of Breast-feeding

One of the major factors indicative of the likely success and adequacy of breastfeeding, as well as the effectiveness of lactational amenorrhea as birth control in early life, is the frequency of breastfeeding (Haggerty and Rutstein, 1999). The international recommendation is breastfeeding on demand, or as often as the child expresses need. In the tables that follow, the frequency of breastfeeding (total number of feeds in the previous 24 hours) is examined by demographic and

socio-economic characteristics of the mother. Then a Chi-square test was used to determine if there was a significant statistical association between frequency and the independent variables.

4.2.1. Demographic Factors and Intensity (frequency) of Breast-feeding

a) Maternal Age

Examination of differentials in the number of breastfeeds in the preceding 24 hours (table 5.1) by mother's age shows that older mothers breastfeed slightly more intensively (35.8 percent) than younger mothers (29.9 and 30.5 percent) in the age groups 25-34 and 15-24 respectively. However, the chi-square test does not depict any significant association (X^2= 2.156 and P>0.05).

b) Parity

As can be observed from the table (5.1), examination of parity with intensity of breastfeeding showed that higher proportions of mothers of higher parity (with six or more children) were found to breastfeed more intensively or on demand (40 percent) compared to mothers with 3-5 children (29.4 percent) and those with 1-2 children (25.4 percent). The bivariate analysis also showed that the two variables are significantly associated with one another with a p-value less than 0.01 and chi-square value of 12.889 at one degree of freedom. This variation can be explained by the fact that higher parity mothers are more experienced in breastfeeding practices than lower parity mothers.

c) Sex of Child

The results in table 5.1 do not show sex preferences in intensity of breastfeeding. Mothers of both sexes breastfed with similar frequencies that only 31.5 percent breastfeed up on demand. The Chi-square result also did not show any significant association (X^2=0.000 and P>0.05).

Of the demographic variables considered in the analysis only parity has shown a significant association with intensity of breastfeeding where as differentials by maternal age and sex of child did not exhibit a significant statistical association.

Table 5.1 Frequency (Intensity) of Breast-feeding by Demographic variables.

Demographic Variables	*Number of Breast-feeds in the previous 24 hours*			*Chi-square*	P-Value
	<=12 times	*> 12 times (On demand)*			
Maternal Age	Percent	Percent	*Total*	2.16 (2 df)	P>0.05
15 - 24	69.5	30.5	243 (100 %)		
25 - 34	70.1	29.9	364 (100 %)		
35 - 49	64.2	35.8	187 (100 %)		
Total	68.5	31.5	794 (100 %)		
Parity				12.889** (2 df)	P<0.01
1 – 2 Children	74.6	25.4	236 (100 %)		
3 – 5 Children	70.6	29.4	313 (100 %)		
6+ Children	60.0	40.0	245 (100 %)		
Total	68.5	31.5	794 (100 %)		
Sex of the Child				0.000 (1 df)	P>0.05
Male	68.5	31.5	400 (100 %)		
Female	68.5	31.5	394 (100 %)		
Total	68.5	31.5	794(100 %)		

*** = P < 0.001, **= P < 0.01, *= P <0.05, Source: EDHS, 2005.

4.2.2. Socio-economic Differentials in Intensity of Breast-feeding.

a) Place of Residence

Table 5.2 shows the percentage distribution of women still breastfeeding their last child and living with them who were breastfed 0 -12 and more than 12 times (on demand) in the 24 hours preceding the survey by socio-economic characteristics of the mother. The bivariate analysis results in table 5.2 further reveals the differentials in intensity of breastfeeding between rural and urban mothers. Accordingly, rural mothers are more likely to breastfeed intensively, i.e., more than 12 times in the preceeding 24 hours accounting for about 32 percent than their urban counterparts (18.2 percent). This association however, is not statistically significant as indicated by the Chi-square result (x^2= 2.8 and P>0.05).

b) Maternal education

In the table (5.2), it is clearly shown that mothers with no schooling tends to breastfeed more frequently or on demand (33.4 percent) than those with primary (24.3 percent) and secondary or higher education (24.0 percent). The Chi-square test results also established a significant association (X^2= 5.64 and P<0.05). This is due to the fact that educated mothers are more likely to work away from home and are at the forefronts of substituting breast milk with other supplemental foods including bottle-feeding. Educated mothers are also more likely to follow scheduled feedings. All of which could affect frequency of suckling.

c) Work status

The data in table 5.2 indicates that mothers who are working are breastfeeding less frequently than those not working (25.3 Vs 34.0 percent). Evidence provided by the Chi-square result in the same table for the relationship between mother's work and frequency of breast-feeding seems to be in support of a stronger association with (X^2= 5.7 and P <0.01). The lowest observed intensity of breastfeeding among working mothers could be attributed to the incompatibility of working with breastfeeding since it requires mother's time and patience especially during harvesting season, when rural mothers were busy in the crop activities. The literature also documented similar findings in Uganda (Boerma *et.al*, 1991).

c) Contrceptive use

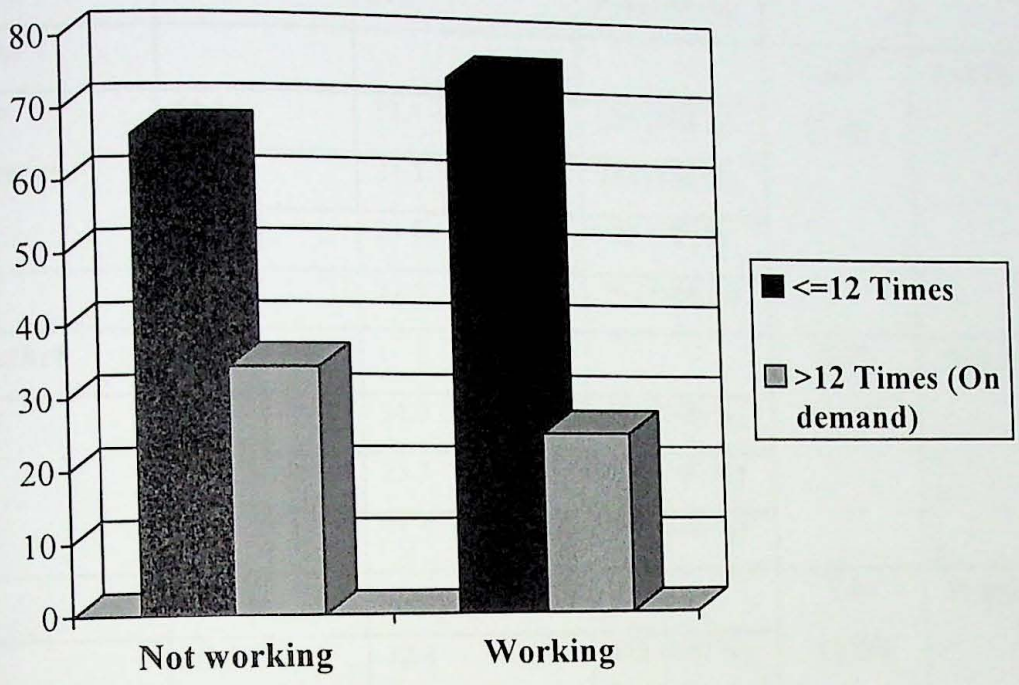
The 2005 EDHS data (table 5.2) provide no evidence of a marked differential in the frequency of breast-feeding by contraceptive use (X^2= 1.44 and P>0.05), despite the fact that most mothers who never used contraception breastfeed slightly more frequently (32.4 percent) than those who used contraception (27.3 percent). This is due to the fact that most of contraceptive users are better educated, urban, working and lower parity mothers, variables which are believed to have a significant negative impact on breastfeding practices.

e) Bottle-feeding

Table 5.2 also shows the differentials in intensity of breastfeeding by bottle-feeding. According to this table, mothers who do not use bottles to feed their child less than three years of age breastfeed

slightly more intensively (33.4 percent) than those using bottles (29 percent). Nonetheless, the Chi-square result did not establish a significant statistical association between these variables (x^2= 1.29 and P> 0.05). However, bottle-feeding could have a significant negative effect on frequency of breastfeeding especially on daytime frequency (data not shown).

Fig. 9 Intensity of Breast-feeding by Mother's Work status, Oromia, 2005.



Conclusively, among the socio-economic variables considered at the bivariate level, differentials in intensity of breastfeeding due to maternal education and work status were found significant. As previously discussed, mothers with no education are more likely to breastfeed up on demand than those with primary and secondary or higher education. However, differences in frequency of breastfeeding by place of residence, contraceptive use and bottle-feeding were insignificant.

Table 5.2 Frequency (Intensity) of Breast-feeding by Socio-economic Variables.

Socio-economic Variables	*Number of Breast-feeds in the previous 24 hours*			*Chi-square*	*P-Value*
	<=12 times	*> 12 times (On demand)*			
Place of residence	*Percent*	Percent	*Total*	2.82 (1 df)	P>0.05
Urban	81.8	18.2	33 (100 %)		
Rural	67.9	32.1	761 (100 %)		
Total	68.5	31.5	794 (100 %)		
Maternal Education				5.64* (2 df)	P<0.05
No Education	66.6	33.4	625 (100 %)		
Primary education	75.7	24.3	144 (100 %)		
Secondary +	76	24.0	25 (100 %)		
Total	68.5	31.5	794 (100 %)		
Work Status of Mother				5.7* (1 df)	P<0.05
Not Working	66.0	34.0	565 (100 %)		
Working	74.7	25.3	229 (100 %)		
Total	68.5	31.5	794 (100 %)		
Contraceptive use				1.44 (1 df)	P>0.05
Never Used	67.6	32.4	651 (100 %)		
Ever Used	72.7	27.3	143 (100 %)		
Total	68.5	31.5	794 (100 %)		
Bottle-feeding (<=3 years)				0.506 (1 df)	P>0.05
No	66.6	33.4	293 (100 %)		
Yes	71.0	29.0	69 (100 %)		
Total	67.4	32.6	362 (100 %)		

*** = P < 0.001, **= P < 0.01, *= P <0.05, Source: EDHS, 2005.

4.3 Bivariate Analysis of the Differentials in proportions Breast feeding at different durations

4.3.1. Demographic Differentials

a) Maternal Age

An examination of differentials in the proportions breast-feeding for prolonged durations by mother's age (table 6.1) suggest that with increasing age of the mother the proportions breastfeed beyond two years tends to increase. Hence, older mothers or in the age groups 35-49 were found to breastfeed for prolonged durations i.e. beyond 24 months (29.8 percent) compared to middle aged (25-34) with 19.5 percent and younger women (15-24) accounting to 9.4 percent. The Chi-square result also showed a significant and strong statistical association (x^2= 82.63 and P< 0.001). The fact that in societies where extended (prolonged) breastfeeding is common, weaning usually takes place after the women become pregnant again, and younger mothers are more likely to become pregnant again than elders. Older women are; therefore, tend to breastfeed for prolonged duration than their younger counterparts partly due to differences in fecundity by age (WFS, 1987) and in part older women are more traditional in orientation than younger. More over, youngest women lack the experience of breastfeeding. It is also possible to suggest that younger mothers may be more educated. The 1995 fertility survey of Addis Ababa confirmed this association that the proportion of prolonged breastfeeding (i.e. for 24 months or more) increases with age of mothers. The proportion was 43.3 percent for women aged under 25,it was 48 percent for the young adults (25-34 years and it was 52.7 percent for older women (45-49 years of age).

b) Parity

The relationship between parity and duration of breastfeeding was examined by grouping mothers into three categories based on the number of children they ever born (table 6.1). The first group includes women with 1-2 children, the second those with 3-5 children and the last group those with six and more children. Examination of the differentials in the proportions breastfeeding at different durations reveal that higher proportion (24.3 percent) of mothers of higher parity (with six or more children) were found to breastfed for more than 24 months as compared with women with 3-5 children (21 percent) and those of lower parity mothers or with 1-2 children (12.4 percent) and the difference was statistically significant (x^2= 26.545 and P<0.001). Yeshewamebrat (1995) in Addis

Ababa and Haider and his colleagues (1995) in Bangladesh also observed such an association, which may be expected, since women of higher parity are also those who are likely to be older; younger women may be expected to have a higher level of education and be more likely to break with traditional behavior patterns than older and less well educated women.

c) Sex of the Child

As the results in table 6.1 indicate differences in duration of breast-feeding by sex of the child are small indicating sex preference in breastfeeding practices (duration) is not observed in the region. Thus, the percentage of mothers with male and female children who breastfeed beyond two years found to be much more balanced (18.5 and 20.7 percent) for male and female children, respectively. The Chi-square result also did not depict any significant association (x^2= 8.57 and P> 0.05).

Table 6.1 Proportion of Women Breastfeeding at different durations by Demographic variables.

Demographic Variables	*Proportions Breast-feeding (in months)*						*Chi-square*	*P-Value*
	0-6	*7-12*	*13-18*	*19-24*	*>24*			
Maternal Age	%	%	%	%	%	*Total*	82.63***	P<0.001
15 - 24	37.8	23.7	16.7	12.4	9.4	100	(2 df)	
25 - 34	21.1	19.3	18.8	21.3	19.5	100		
35 - 49	16.4	20.0	11.5	22.3	29.8	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Parity							26.545***	P<0.001
1 – 2 Children	29.9	21.7	16.9	19.1	12.4	100	(2 df)	
3 – 5 Children	25.6	17.5	16.7	19.2	20.9	100		
6+ Children	18.3	23.4	15.0	19.1	24.3	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Sex of the Child							8.57	P>0.05
Male	27.3	18.5	17.5	18.2	18.5	100		
Female	21.4	22.9	14.9	20.1	20.7	100		
Total	24.4	20.7	16.2	19.1	19.6	100		

*** = P < 0.001, **= P < 0.01, *= P <0.05, Source: EDHS, 2005.

4.3.2. Socio-economic Differentials in proportions breast-feeding at different durations.

Table 6.2 clearly demonstrated the percentage distribution of mothers who breastfed their most recent child for at least 6, 12, 18, 24 and beyond 24 months by socio-economic variables. The bivariate analysis for socio-economic characteristics of the mother revealed that place of residence, education, work status; contraceptive use and bottle-feeding practices are significantly associated with proportions breastfeeding at different durations.

a) Place of Residence

As expected rural-urban differentials in the percentage of women breast-feed beyond 24 months shows that higher proportions (20.4 percent) of rural mothers were found to breast-feed beyond two years compared with urban mothers (9.3 percent). A significant statistical association was also observed (X^2= 21.925 and P<0.001). There are a number of reasons to expect differences in the proportions breastfeeding at different duration between rural and urban women. The employment situation of women differs substantially between rural and urban areas. Most urban women have job outside home while the majority of rural women work around their home, on the farm or household sideline industries, or are housewives hence, remain in close physical contact with their children. Besides, cultures in rural areas are supportive of breastfeeding practices. On the other hand, urban mothers are more likely to use feeding bottles, which is considered as a modern behavior. Hence, are less likely to breastfeed for extended durations. These differences are also evident and conform closely to the findings of Abdulahi (1989) and the 1990 NFFS of Ethiopia.

b) Maternal Education

There is a clear indication that the proportion of breastfeeding mothers for prolonged durations varies according to their educational level. Higher percentage of mothers with no education and primary education were found to breast-feed for prolonged durations (> 24 months) accounting for about 19 percent compared to those with secondary and above education (14 percent). This difference is also found to be significant as indicated by the Chi-square results (X^2=18.83 and P<0.05). Hence, the results of the bivariate analysis (table 6.2) lend clear support to the widely recognized association between increased education and shorter breastfeeding durations, which is

also compatible with the study hypothesis. The results are consistent with earlier findings (Daniel, 2001; Yeshewamebrat, 1995).

c) Work Status of Mothers

Contrary to the negative impact of maternal work status on the intensity of breast-feeding, the result in table 6.2 indicates most working mothers breastfeed beyond two years compared to non-working. Differentials in proportions breast-feeding at different durations according to mother's work status clearly showed that at regional level higher proportions of currently working women breast-feed for more than two years (26.6 percent) than those not working (16.5 percent). The Chi-square result also showed a significant association (x^2= 26.179 and P<0.001), which is not consistent with the study hypothesis. However, when the differences are examined across rural and urban settings, slightly higher percentage of non-workingwomen in urban areas breastfeed beyond two years than those not-working (10.4 Vs 7.4 percent), despite statistically not significant (x2= 5.684 and P>0.05). On the other hand, the reverse is true in rural areas that higher percentage of working women breast-feed for more than two years compared to those not working (28.3 Vs 16.9 percent) and the difference was highly significant as indicated by the Chi-square result (x^2= 27.316 and P<0.001). The reason for this may be that, most of working women in rural areas are engaged in self-employed agriculture. Perhaps, working does not take them far away from home for long periods of time. Again, since the majority of such working women perform physical or manual work, it is reasonable to assume that they are mostly less educated or uneducated. This evidence was also supported by the information collected from key informant interviews in sebeta wereda that working mothers in rural Oromia have a tradition to bring their children with them to their place of work and can breastfeed there, perhaps may not be frequently. The 1990 National Family & Fertility Survey of Ethiopia, Boerma and his colleagues (1991) in Uganda and Haider and his colleagues (1995) in Bangladish have also documented similar findings.

d) Contraceptive Use

The bivariate result presented in table 6.2 clearly shows the proportion of women who breast-feed beyond 24 months found to be higher (24.6 percent) for mothers who used contraception compared to non users (18.2 percent). This association was also found statistically significant with a Chi-square value of x^2= 25.305 and P<0.0.001. The possible explanation for this variation as

documented in various literatures is that contraception operates to increase birth intervals, which permits breastfeeding to be continued over extended periods (WFS, 1987). Accordingly, in two countries included in 1987 WFS, Indonesia and Sirilanka, contraceptive use is associated with longer breastfeeding duration.

e) Bottle-feeding

Bottle-feeding is not recommended for the vast majority of infants in developing countries because of the potentially adverse effects of contamination from water, utensils, and hands during preparation and storage of formula and other bottle-feeds, and the potential for over dilution of instant formula with water, rendering the bottle-feed nutritionally inadequate (WHO, 2002). Despite this fact, a large shift to bottle-feeding has been observed in developing countries and eroding the tradition of prolonged breast-feeding. An examination of the differentials in the proportion of women breastfeeding for longer duration shows a significant difference between mothers who do not practiced bottle-feeding and those who used feeding bottles. Higher proportion of mothers (22 percent) who used feeding bottles were found to breast-feed beyond two years compared to those practiced bottle-feeding (11.7 percent). The Chi-square result in table 6.2 also displayed a highly significant association (x^2 = 40.74 and P<0.001). Tigist and her colleagues (1993) in Addis Ababa were also document such an association. Moreover, Boerma and his colleagues (1991) in Uganda also found a similar pattern.

f) Religion of the mother

An examination of the differentials in the proportion of women who practiced prolonged breast-feeding by religion in table 6.2 shows higher proportion (39 percent) of women in the category of traditional beliefs breast-feed for 24 or more months followed by Christians (21.5 percent) and Muslims (16.5 percent). The bivariate analysis (table 6.2) also exhibits a highly significant association (x^2= 28.16 and P<0.001). In addition, mothers who are the followers of traditional beliefs breast-feed for longer duration (on average for 25 months) than Christians (24.7 months) and Muslim women (23.4 months).

Table 6.2 Proportion of Women Breastfeeding at Different Durations by Socio-economic variables.

Socio-economics Variables	*Proportions Breast-feeding (in months)*						*Chi-square*	*P-Value*
	0-6	*7-12*	*13-18*	*19-24*	*>24*			
Place of Residence	%	%	%	%	%	*Total*	21.925***	P<0.001
Urban	33.3	10.7	12.0	34.7	9.3	100	(1 df)	
Rural	23.7	21.4	16.5	18.0	20.4	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Maternal education							18.83*	P<0.05
No education	24.1	21.4	17.1	17.6	19.9	100	(2 df)	
Primary education	24.3	21.8	12.1	21.8	19.9	100		
Secondary+	30.0	4.0	18.0	34.0	14.0	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Work Status							26.179***	P<0.001
Not Working	27.8	20.5	17.1	18.1	16.5	100	(1 df)	
Working	16.6	21.1	14.2	21.5	26.6	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Urban							5.684	P>0.05
Not Working	39.6	6.3	8.3	35.4	10.4	100	(1 df)	
Working	22.2	18.5	18.5	33.3	7.4	100		
Total	33.3	10.7	12.0	34.7	9.3	100		
Rural							27.316***	P<0.001
Not Working	27.0	21.5	17.7	16.9	16.9	100	(1 df)	
Working	16.1	21.4	13.8	20.4	28.3	100		
Total	23.7	21.4	16.5	18.0	20.4	100		
Contraceptive Use							25.305***	P<0.001
Never used	25.1	22.6	17.3	16.8	18.2	100	(1 df)	
Ever used	21.6	14.0	12.3	27.5	24.6	100		
Total	24.4	20.7	16.2	19.1	19.6	100		
Bottle-feeding							40.74***	P<0.001
No	20.8	18.3	17.3	21.6	22.0	100	(1 df)	
Yes	32.1	33.3	13.0	9.9	11.7	100		
Total	22.6	20.7	16.6	19.8	20.4	100		
Religion							28.16***	P<0.001
Christians	26.1	16.8	15.3	20.3	21.5	100	(2 df)	
Muslims	23.3	24.0	18.1	18.1	16.5	100		
Traditional	19.5	22.0	0.0	19.5	39.0	100		
Total	24.4	20.7	16.2	19.1	19.6	100		

*** = P < 0.001, **= P < 0.01, *= P <0.05, Source: EDHS, 2005.

Fig. 10 Proportion of Women Breast-feeding at different durations by Education, Oromia, 2005.

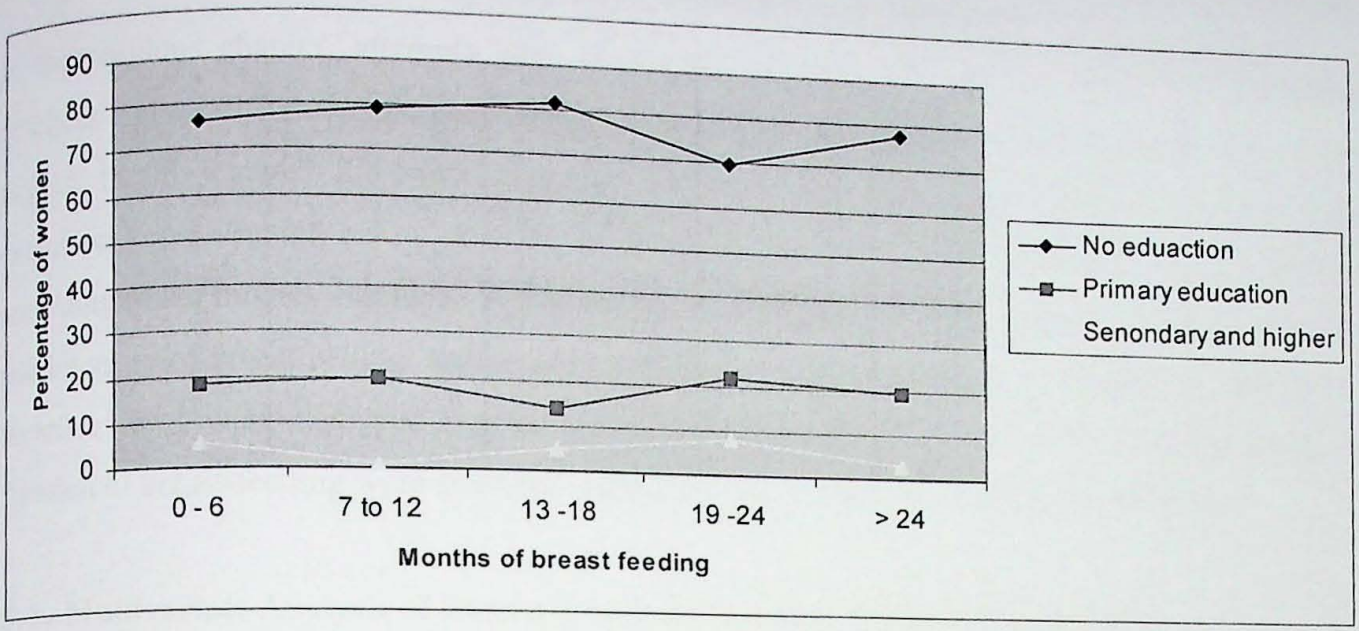
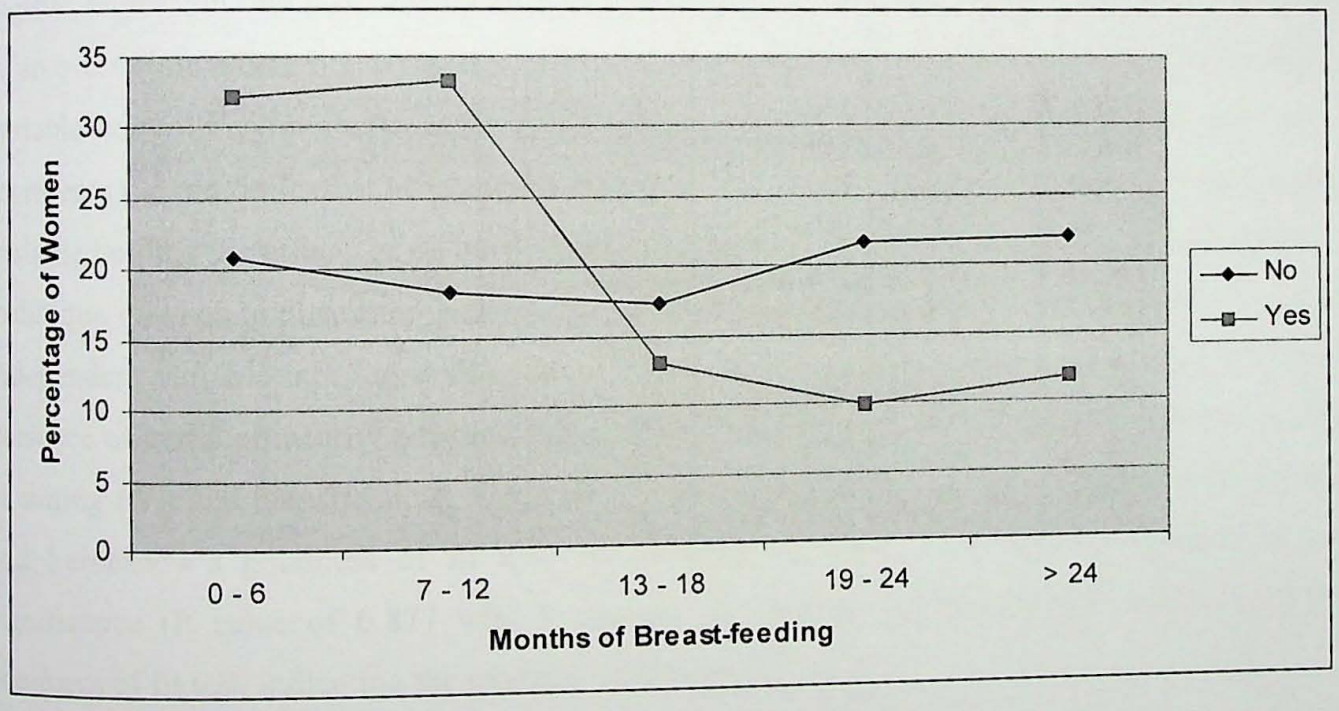


Fig. 11 Proportion of Women Breast-feeding at Different Durations by Practice of Bottle-feeding, Oromia, 2005.



CHAPTER V
DETERMINANTS OF BREAST-FEEDING PRACTICES: Results of Multivariate Analysis

In the previous chapter, attempts have been made to show the differentials in breast-feeding practices across different socioeconomic, demographic and health care characteristics of the targets. In this chapter the most important variables that affect breast-feeding practices were examined and presented below. In order to facilitate the analysis interpretation will be presented according to the models employed. Accordingly, to find the most important predictors of initiation and intensity of breastfeeding, variables significantly associated with these dependent variables at bivariate level were analyzed further using logistic regression model, while determinants of duration of breast-feeding were analyzed using Multiple Classification Analysis technique.

5.1. Multivariate Analysis of Determinants of Timing of Initial Breast-feeding

Since the dependent variable is dichotomous (either a mother has initiated breast-feeding immediately or not), the logistic regression technique was preferred as a multivariate method of analysis. In the logistic regression model, the dependent variable was categorized as '1', if the mother initiated breastfeeding immediately (with in one hour after birth), and '0' otherwise. In logistic regression, the coefficient ß represents increase or decrease in the log odds of occurrence of an event (immediate breastfeeding in this case) associated with a unit change in the independent variable controlling for the possible confounding effects of all other variables. The term exp. ß represents the multiplicative estimates in the odds of an event for a unit change in the independent variable holding the effects of all other predictors constant. In the application of logistic regression technique one has to check the presence of multicollinearity between the independents i.e., if one independent variable is a linear function of other independent variables. Accordingly, due to the presence of multicollinearity between maternal age and parity, parity was deleted from the analysis of timing of initial breastfeeding. More over, ''Goodness of fit'' was also checked using Hosmer and Lemeshow's goodness of fit test. As presented in table 7, the model showed the non-significance (P value of 0.877 with 8 degrees of freedom) on the Hosmer and Lemeshow's goodness of fit test, indicating the model is well fitting.

5.1.1. Demographic Variables and Timing of Initial Breast-feeding

Maternal age at birth of the last child and sex of the child are the demographic variables considered in this study. Of these variables only age of the mother emerged as significant predictor of timing of initial breastfeeding in the multivariate analysis.

As the results in table 7 show, controlling for the possible effects of other confounding variables (demographic, socio-economic and health care characteristics of the mother), the likelihood of being initiating breast-feeding with in an hour after birth increases with maternal age moving from age group 15-24 to 25-34 and 35-49, with odds ratio of 1.527 and 1.862, respectively. In other words older mothers in the age group of 35-49 had about two times higher chance of breastfeeding immediately compared to those in younger ages (15-24). Similarly, middle-aged mothers were also had 1.5 times higher chance of initiating breast-feeding immediately compared to the younger (15-24), which is consistent with the study hypothesis that older mothers initiate breastfeeding immediately than younger mothers. The literature outlines possible reasons that can explain this variation and that older women have rich experience in breast-feeding practices and are more knowledgeable about the benefits of early initiation of breastfeeding compared to young mothers.

The analysis further shows that although sex of child does not have a significant impact on timing of initial breastfeeding, mothers of female children had 1.134 times higher chance of initiating breast-feeding immediately compared to mothers of male children.

Table 7: Logistic Regression Results of the effect of Demographic, socio-economic and Health Care Variables on Timing of Initial Breast-feeding, Oromia, 2005.

Variables	B	SE (B)	Sig.	EXP. (B)
Maternal Age				
15-24 (RC)				
25-34	0.423	0.209	0.068	1.000
35-49	0.622	0.287	0.043	1.527
			0.030	1.862*
Sex of Child				
Male (RC)				
Female	0.126	0.148	0.395	1.134
Place of residence				
Urban (RC)				
Rural	0.223	0.340	0.512	1.000 1.250
Maternal Education				
No education (RC)				
Primary education	-0.006	0.193	0.536 0.974	1.000 0.994
Secondary+	-0.425	0.389	0.276	0.654
Ever use of Contraception				
Never used (RC)				
Ever used	-0.492	0.186	0.008	1.000 0.611**
Work Status				
Not working (RC)				
Working	-0.087	0.161	0.587	1.000 0.916
Bottle-feeding				
No (RC)				
Yes	-0.305	0.222	0.168	1.000 0.737
Place of delivery				
Home (RC)				
Health facility	-0.034	0.263	0.898	1.000 0.967
Delivery Assistant Health Professional				
No (RC)				1.000
Yes	-0.181	0.335	0.589	0.834
Hosmer and Lemeshow's goodness of fit test				
Chi-square = 3.774 Degree of Freedom (DF) = 8 Sig. = 0.877				

*** Significant at P<0.001 level, ** Significant at P<0.01, * Significant at P<0.05.

5.1.2 Socio-economic and health care Factors and Timing of Initial Breast-feeding.

The socio-economic and health care variables considered at the multivariate level were place of residence, maternal education, ever use of contraception, place of delivery and type of delivery assistant. Of these variables, only ever use of contraception, showed a significant and negative impact on the timing of initial breast-feeding. The results in table 7 show that controlling for the possible effects of other confounding variables mothers who ever used contraception were less likely to initiate breast-feeding immediately than non-users. The result shows that mother's practice of contraception retained its significant influence ($P<0.05$) on the timing of initial breastfeeding in the presence of other socio-economic and health care variables. Mothers who ever used contraception were found less likely to put the child on breast (with odds ratio of 0.611) than non-users. That is, contraceptive use reduces the likelihood of initiating breastfeeding immediately by about 40 percent. The lower probability of immediate breast-feeding for contraceptive users supports the hypothesized relationship between contraception and initial breast-feeding practices. This is due to the fact that contraception tends to be preferred by mothers in socio-economic groups (urban and educated) that are less inclined toward breastfeeding. It is also to be noted that the effect of contraceptive use is indirect.

On the bivariate analysis, the effect of residence, maternal education and health care characteristics (place of delivery and type of delivery assistant) on initiation of breast-feeding have shown significant association, but at the multivariate level (table. 7) after controlling for the possible effects of other predictors their effect have been disappeared. However, their effect on initiation is still continued, despite not significant. For instance, the likelihood of being a mother initiate breast-feeding immediately decreases as mother's level of education increases. Having secondary and above education decreased the likelihood of mother's initiating breastfeeding by about 35 percent. But, mothers with no education and primary education had almost similar probabilities in the timing of initial breastfeeding. Rural mothers were also more likely to practice immediate breast-feeding (with odds ratio of 1.250) than their urban counterparts, that rural mothers had 25 percent more chance of initiating breast-feeding immediately after birth than mothers in urban areas.

Practice of bottle-feeding and type of assistant at delivery were also affected immediate breastfeeding negatively, despite their impact were not significant. Mothers who used feeding bottles had about 26 percent less chance of breastfeeding immediately than mothers not practicing bottle-feeding. More over, mothers who were assisted by health professionals at delivery had about 16 percent less chance of initiating breastfeeding with in an hour after birth. As the results of the in-depth interview indicated earlier, since health professionals are providing delivery service in hospitals and the procedures of hospital practices after delivery (for instance, separation of the new born from the mother for several hours) are more likely to reduce early initiation of breastfeeding

In summary, among the demographic, socio-economic and health care variables considered at the multivariate level, age of mother and ever use of contraception were found important predictors of early initiation of breast-feeding.

5.2. Multivariate Analysis of Determinants of intensity of Breast-feeding

The dependent variable here also dichotomously classified (either a mother has breastfed on demand or not). Hence, logistic regression technique was preferred as a multivariate method of analysis. In the logistic regression model, the dependent variable was categorized as '1', if the mother breastfed on demand (more than 12 times in the preceding 24 hours), and '0' if otherwise. The model's 'Goodness of fit' was also checked using Hosmer and Lemeshow's goodness of fit test. As presented in table 8, the model showed the non-significance (P value of 0.165 with 8 degrees of freedom) on the Hosmer and Lemeshow's goodness of fit test, indicating the model is well fitting.

5.2.1. Demographic and socio-economic Variables and intensity of Breast-feeding

The demographic and socio-economic variables, which have shown a significant association with intensity of breast-feeding at the bivariate level and considered here were maternal education, work status and parity. Of these variables, only parity and work status retained their significant influence ($P< 0.01$ and $P<0.05$, respectively) on intensity of breast-feeding in the multivariate analysis.

The analysis of the relation between frequency of breast-feeding and parity showed that after controlling for the possible effect of other factors, mothers of higher parity are more likely to breastfeed frequently (more than 12 times in the preceding 24 hours) than those in the lower parity. The likelihood of breastfeeding up on demand increased from odds ratio of 1.44 to 2.719. In other words, higher parity mothers (with 6 or more children) had about three times more chance of breastfeeding intensively than those in the lower parity (with 1-2 children). Similarly, mothers with 3-5 children had about 1.5 times more chance of breastfeeding intensively than mothers with 1-2 children in the presence of other demographic and socio-economic variables, which is also consistent with the research hypothesis. The variation in frequency of breast-feeding due to parity could be explained by the fact that lower parity mothers have less experience in breast-feeding and are more likely to be in a better educational level and to be working far away from home hence are less likely to breastfeed on demand.

The results in table 8 further confirm the strong relationship established in the bivariate analysis between mother's work status and intensity of breast-feeding. The findings show the negative impact of mother's work on the likelihood of breastfeeding on demand. Working mothers were less likely to practice frequent breastfeeding (with odds ratio of 0.657) than those who did not work. As it is clearly shown in the table, being working decreased the likelihood of mother's breastfeeding on demand by about 34 percent. Moreover, this was supported by the results of indepth interview with working mothers that they found frequent breastfeeding incompatible with working, though they do not go far away from home and took their children with them. Similar findings were observed in Nigeria that mother's work had a negative effect on breastfeeding intensity (Orwell *et al*, 1999). However, Davis (1996) in Uganda found that working mothers breastfed more intensively than not working provided that they took their children with them.

At the bivariate level place of residence and maternal education have shown a significant association with intensity of breastfeeding that rural women and those with no education were breastfeed more frequently than urban and educated mothers. However, this influence were found to be insignificant when examined by logistic regression model (table 8). Despite this, rural mothers had about 63 percent more chance of breastfeeding intensively than their urban counterparts. More over, the likelihood of mothers breastfeeding on demand decreased by odds

ratio of 0.702 moving from no education to secondary and higher education. That is, having secondary and higher education decreases the likelihood of mothers breastfeeding intensively by about 30 percent.

The findings in general suggest that parity and work status of mother are the prominent predictors of intensity of breastfeeding that the higher the parity of the mother the more would be the frequency of breast-feeding. Non-working mothers are also found to breastfeed more intensively than those working.

Table 8: Logistic Regression Results of the effect of Demographic and socio-economic variables on intensity of Breast-feeding, Oromia, 2005.

Variables	*B*	*SE (B)*	*Sig.*	*EXP. (B)*
Parity				
1- 2 Children (RC)			0.002	1.000
3- 5 Children	0.365	0.235	0.120	1.440
6 and more	0.691	0.293	0.001	2.719**
Sex of Child				
Male (RC)				1.000
Female	0.005	0.157	0.974	1.005
Place of residence				
Urban (RC)				1.000
Rural	0.489	0.552	0.349	1.631
Maternal education				
No education (RC)			0.272	1.000
Primary	-0.002	0.552	0.998	0.998
Secondary & above	-0.354	0.221	0.110	0.702
Work Status				
Not Working (RC)				1.000
Working	-0.420	0.181	0.020	0.657*
Bottle-feeding				
No (RC)				1.000
Yes	-0.058	0.217	0.788	0.943
Hosmer and Lemeshow's goodness of fit test:				
Chi-square = 11.696				
Degree of Freedom (DF) = 8				
Sig. = 0.165				

Source: EDHS, 2005 & computed by the Author.

Note: B= Regression Coefficient, RC= Reference category, S.E= Standard Error.

5.3. Multi-variate Analysis of Determinants of Breast-feeding Duration

The major objective in this section is to identify the most important variables that affect duration of any breast-feeding. Previously or at the bivariate level, the well-known Chi-square test was performed to find out if there exists a significant association or differentials in the proportion of mothers breastfeeding at different durations according to their demographic and socio-economic characteristics. Accordingly, differentials due to place of residence, maternal age, parity, educational level, work status, contraceptive use, bottle-feeding and religion were found to be statistically significant. However, it was shown that there was no statistically significant association or difference in the duration of breast-feeding by sex of the child. Hence, it may be reasonable to conclude that this variable is less important in explaining the variation in duration of breast-feeding in the study population. The section that follows makes further examination by employing a multi-variate approach.

In the above bivariate analysis, examination of differentials in proportions breast-feeding at different durations by some background characteristics of mothers was done by taking each variable with the duration of breastfeeding at a time. In such type of analysis there was lack of estimating the net effect of a particular variable on the duration of breastfeeding. To examine the net effect of each explanatory variable the effects of other variables was controlled by applying the multi-variate analysis. To this effect, Multiple Classification Analysis (MCA) was employed.

This technique, which is mainly used to analyze data that are categorical, has the ability to demonstrate the effects of each explanatory variable both before and after taking into account the effects of other explanatory variables. MCA is an important model if the interaction effects are statistically not significant. The presence or absence of interaction effects therefore, has to be checked before applying this model. The absence or a non-significant interaction effects imply the additivity of effects. Two-way analysis of variance was used to test for the presence or absence of interaction effects and there observed no interaction between the background variables except maternal age and parity. Excessively close intercorrelation between these two variables is observed and this may causes serious difficulties in computing the values for their coefficients. Therefore, parity is deleted from the analysis.

Upon entering the variables into a multivariate analysis, maternal age, practice of bottle-feeding, work status, contraceptive use and religion were found to significantly affect duration of breastfeeding. However, educational status of the mother and place of residence and sex of child did not contribute to the significantly lower breastfeeding durations.

5.3.1 Demographic Variables and Duration of breast-feeding

Maternal age

As can be observed from the results in table 9, age of the mother evidently exerts a great influence on duration of breastfeeding with older mothers (35-39) breastfeed for longer duration than those in the middle age groups (25-34) and youngest (15-24). Before adjustment for other variables, older mothers (35-49) breastfeed for about 2.4 and 8 months longer than those in the age groups 25-34 and 15-24, respectively. When adjustment was made for other predictors, the difference was about 2.5 months between elders (35-49) and middle age groups (25-34) and about 7.8 months with younger women (15-24). Besides, before adjustment 4 percent of the variation in the duration of breastfeeding was explained by maternal age. The explained variation was slightly decreased to 3.5 percent when the effect of other variables was controlled. Hence the net contribution of maternal age to the variation in the duration of breastfeeding is 3.5 percent (table 9), which is consistent with the study hypothesis. The 2005 EDHS data also shows that older mothers are less educated and less likely to use feeding bottles and these could be the possible explanations for the observed variations in the duration of breastfeeding by maternal age. Provided that older women are more experienced than younger mothers. The results of the in-depth interview with older and young mothers in Southwest Oromia (Sebeta) also support this finding. Abdulahi (1989) in Mettu, Alemaya and Addis Ababa, Yeshewamebrat (1995) and Daniel (2001) in Addis Ababa have also documented similar findings. Eshetu (1994) also documented those mothers in the age group of 35-49 breastfed for about seven months longer than mothers in the age group 15-24.

5.3.2. Socio-economic Variables and Duration of Breast-feeding

Bottle-feeding

When duration of breast-feeding is examined in relation to bottle-feeding, bottle-feeding has shown a significant and negative effect on duration of breastfeeding ($P<0.001$). The findings in table 9 clearly showed that mothers who used feeding bottles breastfeed for about 5 months shorter than

those not practiced bottle-feeding before adjustment and about 4 months shorter after controlling the effect of other confounding variables, which is consistent with the study hypothesis. In addition, about one percent of the variation in duration of breastfeeding was attributed to bottle-feeding even after allowance was made for other independent variables. Consequently the net contribution of bottle-feeding was one percent. The less explanatory power of bottle-feeding to the variation in duration of breastfeeding may be due to the small number of cases who used feeding bottles. Bottle-feeding is mostly practiced by women living in urban areas, better socio-economic and educational status, and the behavior of which are less inclined to breastfeeding practices These women are more are also exposed to mass media (information, education and communication) regarding breast-milk substitutes. Besides, bottle-feeding in urban areas is considered as modern behavior (Tigist et.al, 1993). Similar findings were also documented by Tigist and others (1993) in Addis Ababa. Aregai (2000) in Adigrat town of Tigray also found that bottle-feeding was found to be the main reason given by the study population for weaning.

Maternal Work status

The computed results in table 9 shows working mothers in Oromia region breast-feed for about 3 months longer than those not working before adjustment for other predictors. When adjustment was made for other predictors the difference was reduced to about 2 months. Provided that about one percent of the variation in the duration of breastfeeding was attributed to working, but this proportion was reduced to about 0.4 percent when allowance was made for other independent variables. Consequently, the net contribution of working away from home was 0.4 percent, which is not consistent with the research hypothesis.

Working away from home is usually associated with duration of breast-feeding in a negative direction. However, the computed results show that working is positively related to the duration of breast-feeding. This apparent paradox requires careful explanation. According to the 2005 EDHS (figure not shown), most of the working women in urban areas are working in small scale sales (in informal sectors) which do not far from their home. On the other hand, working rural women are engaged in self-employed agriculture. Perhaps working does not take them far away from home for long periods of time. Again, since such rural working women are performing physical or manual labour, it is reasonable to assume that they are mostly less educated or uneducated and more likely

to breastfeed for longer duration. This was also supported by the information collected from key informant interviews that mothers in rural Oromia have a tradition to bring their children with them to their work places. The 1990 National Family & Fertility Survey of Ethiopia, Boerma and his colleagues (1991) in Uganda and Haider and his colleagues (1995) in Bangladish have also documented similar findings.

Contraceptive use

The fingings in table 9 shows a significant and positive impact of contraceptive use on duration of breastfeeding ($P<0.05$). Un expectedly, contraceptive users in Oromia breastfeed about 3 months longer than non-users both before and afetr adjustment for other predictors, which is not consistent with the study hypothesis. In fact, its net contribution to explain the variation in breastfeeding duration was found to be less (about 0.7 percent). The possible explanation for this variation as documented in various literatures, is that contraception operates to increase birth intervals, which permits breastfeeding to be continued over extended periods (WFS, 1987). However, the results of the in-depth interview with key informants in south west Oromia, (in Sebeta town and surrounding rural areas) did not support this finding that most of the key informants (contraceptive users) reported to breastfeed for relatively shorter durations in the area. On the other hand, those who never used contraception reported to breastfeed for slightly longer durations than users. Similar pattern was observed in two countries that were included in 1987 WFS, Indonesia and Sirilanka that contraceptive use is associated with longer breastfeeding duration, indicating that women in these countries are taking advantage of pregnancy avoidance to breastfeed longer than they otherwise could.

Religion of the mother

The results in table 9 further confirmed the strong relationship between mother's religion and duration of breastfeeding established at the bivariate level. Mothers who are the followers of Traditional beliefs breastfeed 6 months longer than Muslims and about 3 months longer than Christians before adjustment for other predictors. After adjustment was made, the difference in breastfeeding duration between Traditional follwers and Muslims was slightly decreased to 5.8 months and the difference was increased to about 4 months between Traditional follwers and Christans. More over, about 1.4 percent of the variation in the duration of breastfeeding was

attributed to mother's religion, but this proportion was reduced to about 0.83 percent when allowance was made for other independent variables. The net contribution of religion of the mother was 0.83 percent. This may be attributed to the fact that Traditional believers are less educated and are less likely to practice bottle-feeding than the Muslims and Christians. Again, the less explanatory power of religion may also be due to the small number of cases in traditional beliefs category. Haider and his colleagues (1995) in Bangladesh documented that Muslim women breastfeed on average for relatively shorter durations (28.1 months) while their non-Muslim peers breastfeed for 28.8 months.

The significant effect of education and place of residence on breastfeeding duration which was established at the bivariate level was disappeared in the multivariate analysis. However, their effect is still evident. For instance mothers with no education breastfeed for about two months longer than those mothers having secondary or higher level of education . More over, rural mothers were also found to breastfeed one month longer than their urban counterparts.

In summary, all the variables considered explained about 4, 1.0, 0.81, 0.7and 0.42 percent of the variation in the duration of breastfeeding due to maternal age, bottle-feeding, religion, contraceptive use and work status of mothers, respectively. Although these variables are important in explaining variations in breast-feeding durations, age of the mother at the birth of the child is found to be the most important variable. This may be due to the fact that elder mothers have enough experience in parenting and caring their children. The practice of bottle-feeding is also the second most important variable in explaining variation in breast-feeding duration with its negative effect, hence the obvious relationship between breast-feeding duration and the demographic and socio-economic variables is visible. The results confirmed the study hypothesis that duration of breastfeeding is shorter for mothers practicing bottle-feeding, for educated women and longer for older and mothers.

Table 9. Multiple Classification Analysis of Duration of Breast-feeding by Demographic and Socio-economic Variables, Oromia, 2005.

Variables	*Number of cases*	*Un Adjusted Mean*	*Adjusted Mean*	*Eta* (gross effects)	*Beta* (net effects)	*P-Value*
Place of residence						
Urban	75	18.28	17.00			
Rural	1050	17.96	18.06	0.005	0.017	P>0.05
Age of mother						
15-24	296	13.03	13.42			
25-34	521	18.87	18.70			
35-49	308	21.27	21.23	0.201	0.188	P<0.001
Sex of Child		17.95	18.14			
Male	564	18.02	17.84	0.002	0.01	P>0.05
Female	561					
Maternal Education						
No education	859	18.71	18.52			
Primary education	216	18.27	17.91			
Secondary +	50	17.02	17.34	0.026	0.015	P>0.05
Work Status						
Not working	794	17.03	17.33			
Working	331	20.28	19.55	0.095	0.065	P<0.05
Bottle-feeding						
No	952	18.73	18.64			
Yes	173	13.89	14.37	0.112	0.099	P<0.001
Contraceptive Use						
Never used	887	17.28	17.32			
Ever used	238	20.63	20.48	0.088	0.083	P<0.05
Religion of the mother						
Christian	503	19.59	19.00			
Muslim	581	16.28	16.78			
Traditional	41	22.34	22.57	0.118	0.090	P<0.05
Grand Mean = 17.98						
N = 1125						
R Squared = 0.73						

Source: EDHS, 2005 & computed by the Author.

CHAPTER VI
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1. SUMMARY

Evidences suggest that there are many health benefits and advantages of breastfeeding at all stages of life. Early initiation of breastfeeding has consistently shown to be protective against a large range of immediate and longer-term health outcomes that are a significant burden on individuals, the health system and society. Moreover, it is formally recognized that prolonged and frequent breastfeeding is one of the proximate determinants of fertility by prolonging the duration of amenorrhea, especially in developing countries where knowledge and practice of modern contraceptives are low, and all these benefits have been studied very well. Nonetheless, there is little research on factors that affect breastfeeding practices in Ethiopia in general and in Oromia region in particular.

In light of this, the purpose of this study is, to identify the major socioeconomic, demographic and health care variables that affect breast-feeding practices (timely initiation, intensity and duration of breastfeeding) in Oromia region. The targets in the study were ever-married women in the reproductive age group and who had at least one child in the last three/five years preceding the survey.

In order to achieve these objectives data from the 2005 Ethiopian Demographic and Health Survey (EDHS), which was conducted by the Central Statistical Agency and ORC Macro International and primary data collected through in-depth interviews from key informants were used and both bivariate and multivariate analyses were carried out.

From this study, considerably important findings have emerged which could be useful for policies targeting at reducing the existing high fertility and moderately high infant mortality in the region by maximizing the benefits that could be obtained from improved breastfeeding practices. There is no doubt that intervention to promote optimal breastfeeding practices (early initiation, intensive and for longer duration) require an understanding of the factors that affect (determinants, barriers) of breastfeeding.

This study shows that breast-feeding is virtually universal and homogeneously prolonged in Oromia region. The average duration of breastfeeding in the region for surviving children was found to be about 24 months, which is slightly shorter than the national average (25.2 months). It was also shown that rural mothers breastfeed for longer durations (24.2 months) than their urban counterparts (20.8 months).

The findings show significant disparities from international recommendations set by WHO and UNICEF in breastfeeding practices among all the women surveyed. It was observed that about 72 percent of mothers in Oromia initiate breast-feeding immediately (with in an hour of birth) while the remaining (28 percent) did so latter than an hour. As to the intensity (frequency) of breast-feeding, only 31.5 percent of mothers breastfeed up on demand (frequently) while the majority (68.5 percent) were found not to breast-feed on demand.

Subsequently, an attempt was made to investigate differentials in initiation, intensity and duration of breast-feeding according to the demographic, socio-economic and health care characteristics of mothers. The demographic, socio-economic and health care variables considered to affect the timing of initial breast-feeding were maternal age, parity, sex of the child, educational level, work status, contraceptive use, bottle-feeding, place of residence, religion, place of delivery and type of delivery assistant. Of these explanatory variables that have been included in the bivariate analysis, differentials in initiation of breast-feeding by maternal age, parity, place of residence, education, contraceptive use, place of delivery and delivery assistance by health professionals found to be statistically significant. Accordingly, rural, older, higher parity mothers and those with no education and gave birth at home were found to initiate breastfeeding immediately than their counterparts. While mothers who used contraception and who were assisted by health professionals were less likely to initiate breastfeeding immediately after birth than non-users and not attended by health professionals. However, analysis of differentials by sex of the child, work status and bottle-feeding were found statistically insignificant.

As to the differentials in intensity of breastfeeding, at the bivariate level only parity, maternal education and work status were found statistically significant. Where as the rest explanatory variables were not significant.

With regard to the duration of breast-feeding, among the ten explanatory variables considered at the bivariate level, the differentials due to age of the mother, parity, residence, education, work status, bottle-feeding, contraceptive use and religion were found to be statistically significant. However, differential by sex of the child was not statistically significant.

The principal method of analysis employed in this study to identify the most important variables, which affect initiation and frequency of breastfeeding, was the logistic regression technique. Accordingly, the analysis of the timing of initial breast-feeding by selected demographic variables showed maternal age had a significant and positive effect ($P<0.05$) with older mothers initiate breast-feeding immediately than younger mothers. Mothers in the age group of 35-49 and 25-34 had about two times and one and half times higher chance of initiating breastfeeding with in an hour after birth, respectively compared to those in younger ages (15-24).

The analysis further demonstrated that among the socio-economic and health care variables only contraceptive use ($P<0.05$) showed a significant and negative impact on immediate breastfeeding. Mothers who used contraception were less likely to initiate breast-feeding immediately than those never used. But, other variables were found insignificant in explaining variations in timing of initial breastfeeding.

Results of the analysis of determinants of the intensity of breast-feeding reveal that among the demographic and socio-economic variables considered, only parity and work status showed a significant association (table 8). Parity was found to be positively and significantly associated with intensity of breast-feeding ($P<0.001$). Higher parity mothers (those with six and more children) had about three times higher chance of breastfeeding intensively (up on demand) compared to lower parity mothers (with 1-2 children). Mothers of parity two (with 3-5 children) had also 1.5 times higher chance of breastfeeding intensively compared to lower parity mothers (those with 1-2 children). More over, work status of mothers was negatively and significantly associated with frequency of breast-feeding ($P<0.05$). The likelihood of working mothers to breastfeed on demand decreases compared to those not-working (with odds ratio of 0.657) or by about 34 percent.

In the application of Multiple Classification Analysis technique to identify the most important demographic and socio-economic variables, which affect duration of breast-feeding, age of mother, bottle-feeding, religion, contraceptive use, and work status were found to be statistically significant according to their relative importance. Where as the effect of maternal education and place of residence were found statistically insignificant. Accordingly, older mothers (35-49) breastfeed for about 3 months longer than those in the middle ages (25-34) and about 8 months longer than younger mothers (15-24). The total variation explained by maternal age alone was about 4 percent. Consequently, maternal age is found to be the most important variable that determines the duration of breastfeeding among the variables considered in the study.

Considering the relationship between maternal work status and duration of breast-feeding, contrary to its negative effect on frequency of breastfeeding, working mothers were found to breastfeed for about 2 months longer than non-working mothers after adjustment for other independent variables. Its net contribution to the variation in duration of breastfeeding, however, was small (only 0.42 percent).

The findings of the study also reveal that bottle-feeding was negatively and significantly correlated with duration of breastfeeding. Mothers who used feeding bottles were found to breastfeed for 4 months shorter than those not practiced bottle-feeding after adjustments were made for other predictors such as age, work and religion. About one percent of the variation in duration of breastfeeding was due to bottle-feeding.

It was also observed that religion of the mother and duration of breastfeeding shows a significant relationship that mothers who are the followers of traditional beliefs breastfeed for about 6 months longer than Muslims and 3.6 months longer than Christians after adjustments was made for other predictors. Moreover, mothers who used contraception were found to breastfeed about three months than those never used, despite its net contribution to the variation in the duration of breast-feeding was low (0.7 percent).

CONCLUSIONS

To sum up, the evidence from the 2005 EDHS and examined in this study suggests that age of mothers positively and contraceptive use negatively affecting timing of initial breastfeeding. Parity (positively) and work status of mothers (negatively) are important determinants of frequency of breastfeeding. Regarding the duration of breastfeeding, maternal age, bottle-feeding, religion, contraceptive use and work status are the most important determinants indicating breastfeeding practices and traditions have been eroded among the younger and most modernized segments of this population. The unexpected results with respect to the positive impact of maternal work status and contraceptive use on duration of breastfeeding suggest the need for further studies.

6.2. Recommendations

The findings of the study hold the following implications for policy purposes:

1. While prolonged breast-feeding is still the norm in Oromia, shorter duration of breast-feeding among younger, educated, and mothers who used feeding bottles was observed, indicating a potential need to target these segments of population with education and media efforts to follow optimal breast-feeding practices (timely initiation, frequent breastfeeding and for longer durations) as improved breast-feeding practices can fulfil a child's right to the highest standard of health.

2. The findings of the study are believed to be important for policies in the areas of health and population. The current population policy considered the promotion of breastfeeding as one of the strategies to safeguard the health of infants and children and to reduce the existing high fertility. Oromia is the region with the highest fertility and moderately high infant mortality in the country. Thus, concerned institutions (Governmental and NGOs) that are responsible in executing this policy should strengthen their effort to promote and support optimal breast-feeding practices. Programmes advertising the various benefits of breast-feeding, particularly those related to improved infant health and lowered susceptibility to pregnancy, should be undertaken. Like wise information, education and communication (IEC) programmes using the mass media such as radio, television, posters, magazines and fliers should be used to increase awareness of such beneficial effects.

3. National policies to improve child health, nutrition, and survival should focus on the crucial areas of initial breastfeeding immediately after birth, especially among younger women and contraceptive users.

4. The findings of the study have shown those younger, more educated, urban mothers and those who used feeding bottles are at the forefront of eroding optimal and traditional breastfeeding practices (early initiation, frequent and prolonged breastfeeding). Therefore counseling and support should be focused on these groups to ensure optimal breastfeeding practices.

5. Findings of the study have indicated contraceptive users were less likely to initiate breastfeeding immediately after birth, while breastfeeding for slightly longer duration, suggesting the need for family planning programmers to encourage and counsel mothers to initiate breastfeeding immediately after birth.

   In general, it called on government to:

   - Ensure health worker skills and appropriate maternity services to support optimal breastfeeding practices.
   - Establish volunteer peer activists to educate mothers and improve breastfeeding duration rates.

5. Finally, further research that clearly focuses on gaining a better understanding of other variables that are not included in the EDHS is needed. In particular, there is a need to investigate the effect of socio-cultural factors such as knowledge and attitudes of mothers on breastfeeding practices.

References

Abulahi Hasen (1989). *Fertility Levels and Differentials in Ethiopia: with reference to Mettu, Alemaya and Addis Ababa*. Unpublished PhD Dissertation, University of Dar es Salam.

Abd El Fattah, M. N., and T. M. Eldin (1994). In CDC 23rd Annual Seminar on Population and Development Issues in the Middle East, Africa and Asia, 664-680. Cairo Demographic Center Research Monograph Series No. 23. Cairo, Egypt.

Akin, J. and others (1988). *Patterns and Determinants of Breast-feeding in Egypt*. In A, H. Hallouda; S.Farid and S, H. Cochranes (ed.) Demographic Responses to Modernization, 447-482, Central Agency for Public Mobilization and Statistics, Egypt.

Aregai W/Gebriel, (2000). *Determinants of weaning practices in a Semi-urban district of Adigrat.* Ethiopia J. Health Dev. 2000; 14(2): 183-189.

Barry Edmonston (1990). *Relationship of Breastfeeding and Contraceptive Use*, Population Studies Center, The Urban Institute, Washington DC, USA.

Benefo, K. D., and A. M. Parnell (1991). *The determinants of breastfeeding practices in Ghana.* In Demographic and Health Surveys World Conference, August 5-7, Washington, DC. Proceedings. Vol. 1, pp. 475-476. Institute for Research Development/Macro International, Columbia, MD.

Boerma J, Rustein FE, Bicego GT (1991). *Bottle use for infant feeding in developing countries: Has the bottle been lost*? Journal of Tropical Paediatriics; 37: 116-120.

Booth, I. (2001). Does the duration of breastfeeding matter? *British Medical Journal,* 322(17): 625-626.

Central Statistical Authority [Ethiopia] and ORC Macro (2001). *Ethiopia Demographic and Health Survey 2000.* Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Authority and ORC Macro.

Central Statistical Agency [Ethiopia] and ORC Macro. (2006). *Ethiopia Demographic and Health Survey 2005.*Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro.

Central Statistical Authority (1995). *The1993 Fertility Survey Report of Addis Ababa*,_Addis Ababa, Central Statistical Authority.

Central Statistical Authority (1991). *The 1990 National Family and Fertility Survey Preliminary Report, Addis Ababa.*

Cunningham, A. A., Jelliffe, D. B. and Jeliffe, E. F. P. (1991) Breast-feeding and health in the 1980s: A global epidemiologic review. *Journal of Paediatrics,* 118(6): 659-666.

Daniel Alemayehu (2001). *Survival Models: Application to predicting the Breast-feeding Duration of mothers in Urban Addis Abeba*. Unpublished MSc Thesis, Addis Ababa University, Ethiopia.

Davis, P. (1996). *Time allocation and infant feeding patterns: women's work in the informal sector in Kampala, Uganda.* In Exclusive breastfeeding promotion: a summary from EPB's Applied Research Program (1992-1996), pp. 26-29. Wellstart International Expanded Promotion of Breastfeeding. Washington, DC.

Dudskieker, L. B., Getchell, J. P., Liarakos, T. M., Hausler, W. J. and Dungy, C. I. (1994). *Nitrate in baby foods*. *Archives of Pediatric and Adolescent Medicine*, 148 (16): 490-494.

Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusu-Agjei S and Kirkwood BR (2006), *Delayed breastfeeding initiation increases risk of neonatal mortality*. Pediatrics. 117(3): 24-33.

Eckhardt K W and Henderahot G E. (1984). *Analysis of the reversal in breast-feeding trends in the United States in the early 1970s. Public Health Rep,* 99(7): 410 -415

Eshetu Gurmu (1995). *Female Labor Force and Fertility in Akaki: A Sub-urban Industrial Town in Ethiopia,* Unpublished MSc. Thesis, Addis Ababa University.

Ferry, B. and D.P. Smith (1983). *Breastfeeding Differentials*, World Fertility Survey Comparative Studies – Cross National Summaries, No. 23 (Voorburg, Netherlands: International Statistical Institute).

Feyisetan, Bamikale J. (1990). *Postpartum Sexual Abstinence, Breastfeeding and Child Spacing Among Yourba Women in Urban Nigeria*, Social Biology, Vol.01.37, No.1-2.

Ferry.B. (1981). Breastfeeding: *WFS Comparative Studies* No.13.

Gaisie, R.H. (1981). *Child-Spacing Patterns and Fertility Differentials in Ghana.*

Gerstein, H. C. (1994). Cow's milk exposure type I diabetes mellitus. A critical overview of the clinical literature. *Diabetes* Care; 17(4): 13-19.

Haggerty, Patricia A., and Shea O. Rutstein (1999). *Breastfeeding and Complementary Infant Feeding, and the Postpartum Effectsof Breastfeeding.* DHS Comparative Studies No. 30. Calverton, Maryland: Macro International Inc.

Haider Rashid Mannan and M.Nurl Islam (1995). *Breastfeeding in Bangladesh: Patterns and Impact on Fertility* Asia-Pacific Population Journal, 10(4): 23-38.

Hoyer S, Horvat L. (2000), *Successful breast-feeding as a result of a health education programme for mother*. J Adv Nurs, 32(11): 1158-67.

Knodel, J ad N. Debavalya (1980). *Breastfeeding in Thailand: Trends and Differentials, 1969-1970,* Studies in Family planning 11(3): 355-377.

Kugler, E. (1984). *The Determinants of Breastfeeding in Mexico*. Unpublished M.Sc. Thesis, Nusing University of North Carolina at Chapel Hill.

Lesthaeghe,R.J. and H.J. Page (1980). *The Postpartum Non-Susceptible Period: Development and Application of Model Schedules*, Population Studies, 34(1): 143-170.

Marild S, Hansson S, Jodal U, Oden A, Svedberg K. (2004). *Protective effect of breastfeeding against urinary tract infection. Acta Paediatr;* 93(2): 164–168.

Ministry of Finance and Economic Development (MoFED) [Ethiopia] (2005). *Ethiopia: Building on Progress: A plan for accelerated and sustained development to end poverty (PASDEP), 2005/06-2009/10.* Addis Ababa, Ethiopia: Ministry of Finance and Economic Development.

Napaporn, C.J. (1990). *Infant Feeding Practices in Thailand*: An Update from1987 Demographic and Health Services, *Studies in Family Planning*; 21(1).

Newcomb, P. A., Storer, B. E. and Longnecker, M. P. et al. (1994). *Lactation and a reduced risk of premenopausal breast cancer. The New England Journal of Medicine*; 330(8): 81-87.

Oken E, Lightdale JR. (2001). *Updates in pediatric nutrition. Curr Opin Pediatr* 2001; 13(3): 280–288.

Orwell S., D. Clayton, and A. E. Dugdale. (1999). *Infant feeding in Nigeria. Ecology of Food and Nutrition;* 15(11):129-141.

Oromia Economic Study Project Office (OESPO) (2000). *Physical and Socioeconomic Profiles of Oromia,* Regional government of Oromia, Addis Ababa.

Oromia Economic Study Project Office (OESPO) (1999). *Health Sector Study: Review and Development Program Final Report*, Regional government of Oromia, Addis Ababa.

Perez. R.E. (1993). *Update on the Breastfeeding Situation in Africa,* Nutrition Research; 13(5): 97-609.

Population Studies and Training Center (PSTC) and Department of Population and Family Health (DPFH) (2002). *Fertility Analysis of Oromia Regional State*, Background Report: Partnership in Improving Reproductive Health Issue 7 1-6

Rasheed S, Siddiqui I, Baig LA. (200). *Decline in breast-feeding, who is to be blamed*? ! ! A study of knowledge, attitude and practice of breast-feeding amongst nurses Pak Med Assoc. 50(1): 108-111.

Renfrew, M. J. and McCandlish, R. (1992). *With women: New steps in research in midwifery*. In Roberts, H. (ed.) *Women's Health Matters*. Routledge, London, pp. 81-98.

Robertson, C. and Goddard, D. (1997). *Monitoring the Quality of Breastfeeding Advice. Health Visitor*, 70(11): 422-424.

Rosenblatt, K. A. (1993). *Lactation and the risk of epithelial ovarian cancer. International Journal Of Epidemiology*; 22(5): 192-197.

Solimano, G. (1992). *Determinants of infant feeding practices: The conceptual framework.* Proceedings of a conference on Actions Needed to Improve Maternal and Infant Nutrition Among Developing Countries. Manila.

Tiedje LB, Schiffman R, Omar M, Wright J, Buzzitta C, McCann A et al (2002). *An ecological approach to breastfeeding. The American Journal of Maternal Child Nursing*; 27 (3): 154–60.

Tigist Ketsla, Dereje Kebede, Hana Neka-Tibeb and Chanyalew Belachew (1993). *Situation Analysis to Study Breastfeeding Patterns and Maternal Behavioral Factors in Ethiopia.* Unpublished, A Report to WHO, Addis Ababa.

Trussell, J.; L. Grummer-Strawn; G. Rodriquez and M.V. Landingham. (1992). *Trends and Differentials in Breastfeeding Behavior: Evidence from the WFS and DHS*, Population Studies 46(3): 285-307.

Tu P. (1991). "Birth Spacing Patterns and Correlates in Shaanix, China", *Studies in Family Planning*, 22(4): 255-263.

United Nations (1983). *Mannual X: Indirect Techniques for Demographic Estimation*, New York.

World Health Organization (1981). *Contemporary Patterns of Breastfeeding*: Report on the WHO Collaborative Study on Breastfeeding, Geneva.

WHO/UNICEF (1990). *Breastfeeding in the 1990s: Review and Implications for a Global Strategy*. Based On the Technical Meeting, Geneva.

WHO (1991). *Indicators for assessing breast-feeding practices (WHO/CDD/SER/9114).* Geneva, Switzerland: World Health Organization.

World Health Organization (2001). *The Optimal Duration of Exclusive Breastfeeding*: Results of a WHO Systematic Review. WHO Geneva http://www.who.int/inf-pr-2001/en/note2001-07.html. (accessed on 03/02/08).

WHO (2002). *The world health reports 2002: reducing risks, promoting healthy life.* Geneva, Switzerland: World Health Organization.

WHO, UNICEF (2003). *Global strategy for infant and young child feeding.* Geneva, Switzerland: World Health Organization.

WHO, UNICEF, UNAIDS, UNFPA (2006). *HIV and infant: new evidence and programmatic experience.* Report of a technical consultation held on behalf of the Inter-agency task team (IATT) on the prevention of HIV infection in pregnant women, mothers and their infants, Geneva, Switzerland.

Yeshewamebat Ejigsemahu (1995). *Breastfeeding Determinants and Birth Interval Effects in Addis Abeba*. Unpublished MSc Thesis, Addis Ababa University, Ethiopia.

ANNEX I

Questionnaire Extracted From the 2005 Ethiopian Demographic and Health Survey.

	Section 1. Respondent's Background	
105	In what month and year were you born?	Month ..... Don't know month .....98 Years..... Don'tknow year 9998
107	Have you ever attended formal school	Yes ..... No.....
108	What is the highest grade you completed?	Grade ..... Technical/vocationalcertificate .....13 University / college Diploma .....14 University/ college degree 15
117	What is your religion?	Orthodox..... Catholic. Protestant ..... Moslem... Traditional.. Other.. (Specify)
	Section 5. Marriage	
501	Are you currently married or living with a man?	Currently married .... Living with a man ..... Not in union .....
502	Have you ever been married or lived with a man?	Formerly married ..... Lived with a man ..... Never married .....
504	What is your marital status now: are you widowed, divorced, or separated?	Widowed ..... Divorced ..... Separated .....
	Section 8. Woman's work	
808	1.As you know some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. Are you currently doing any of these things or any other work?	Yes ..... No .....

Section 2. Reproduction

201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	Yes ..... 1 No 2
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	Yes ..... 1 No 2
203	How many sons live with you? And how many daughters live with you?	Sons at home..... Daughters at home.....
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	Yes ..... 1 No 2
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you?	Sons elsewhere ..... Daughters elsewhere.....
206	Have you ever given birth to a boy or a girl who was born alive but later died?	Yes ..... 1 No 2
207	How many boys have died later? How many girls have died later?	Sons died..... Daughters died.....

Section 3. Contraception

304	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	Yes..... 1 No..... 2
310	Are you currently using any method to delay or avoid getting pregnant?	Yes..... 1 No..... 2
311	Which method are you using	Traditional..... Folkloric ..... Modern.....

Section 4. Breast-feeding

No.		Last birth	Next to last birth	Second from last birth
456	Did you ever breast-feed?	Yes ..... 1 No 2	Yes ..... 1 No 2	Yes ..... 1 No 2
457	How long after birth did you first put (NAME) to the breast? IF LESS THAN 1 HOUR, RECORD '00' HOURS. IF LESS THAN 24 HOURS, RECORD HOURS. OTHERWISE, RECORD DAYS.	Immidiately ...000. Hours 1 ___ ___ Days 2 ___ ___		
457A	Did you squeeze out and throw away the first milk?	Yes . . . . . 1 No.....2		
458	In the first three days after delivery, was (NAME) given anything to drink other than breast milk?	Yes . . . . . 1 No 2		
459	What was (NAME) given to drink?			
460	Is the child living?	Living ..... 1 Dead 2	Living ..... 1 Dead 2	Living .....1 Dead 2
461	Are you still breast-feeding (NAME) ?	Yes ..... 1 No 2	Yes ..... 1 No 2	Yes ..... 1 No 2
462	For how many months did you breastfeed (NAME)?	Months. ..... Don't know ... 98	Months ..... Don't know ..98	Months ..... Don't know ..98
464	How many times did you Breastfeed last night between Sunset and sunrise?	Number of night time feedings ____ Day time ___		

466	Did (NAME) drink anything from a bottle with a nipple yesterday or last night?	Yes ..... 1 No ..... 2 Don't know ... 8	Yes .....1 No .....2 Don't know...8	Yes .....1 No .....2 Don't know...8
468	Do you have at least one child born in 1994 E.C or later living with you?	Yes..... 1 If yes continue with question 8	No..... 2	
432	Who assisted with the delivery	Health Prof..... Other person Trained Birth Att... Un tr.Birth Att..... Commu. Health Ag.. Relative/ Friend.... Other (Specify).... No one.....	Health Prof..... Other person Trained Birth Att... Un tr.Birth Att..... Commu. Health Ag.. Relative/ Friend.... Other (Specify).... No one.....	Health Prof..... Other person Trained Birth Att... Un tr.Birth Att..... Commu. Health Ag.. Relative/ Friend.... Other (Specify).... No one.....
433	Where did you give birth to (Name)	Home.....1 Hospital (health Station)..... 2 Other .....3 (specify)	Home.....1 Hospital (health Station).....2 Other .....3 (specify)	Home.....1 Hospital (health Station).....2 Other .....3 (specify)

ANNEX II

INSTITUTE OF POPULATION STUDIES
COLLEGE OF DEVELOPMENT STUDIES
ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Title: DETERMINANTS OF BREAST-FEEDING PRACTICES IN OROMIA REGION: AN ANALYSIS OF EDHS, 2005.

INTERVIEW GUIDELINES FOR KEY INFORMANTS.

I. For Individual Women (who were initially selected based on the given criteria)

1. Region._____ 2. Wereda _____ Town _____

Kebele_____ Farmers Association _____

3. Age _____ 4. Occupation _____ 5. Religion _____

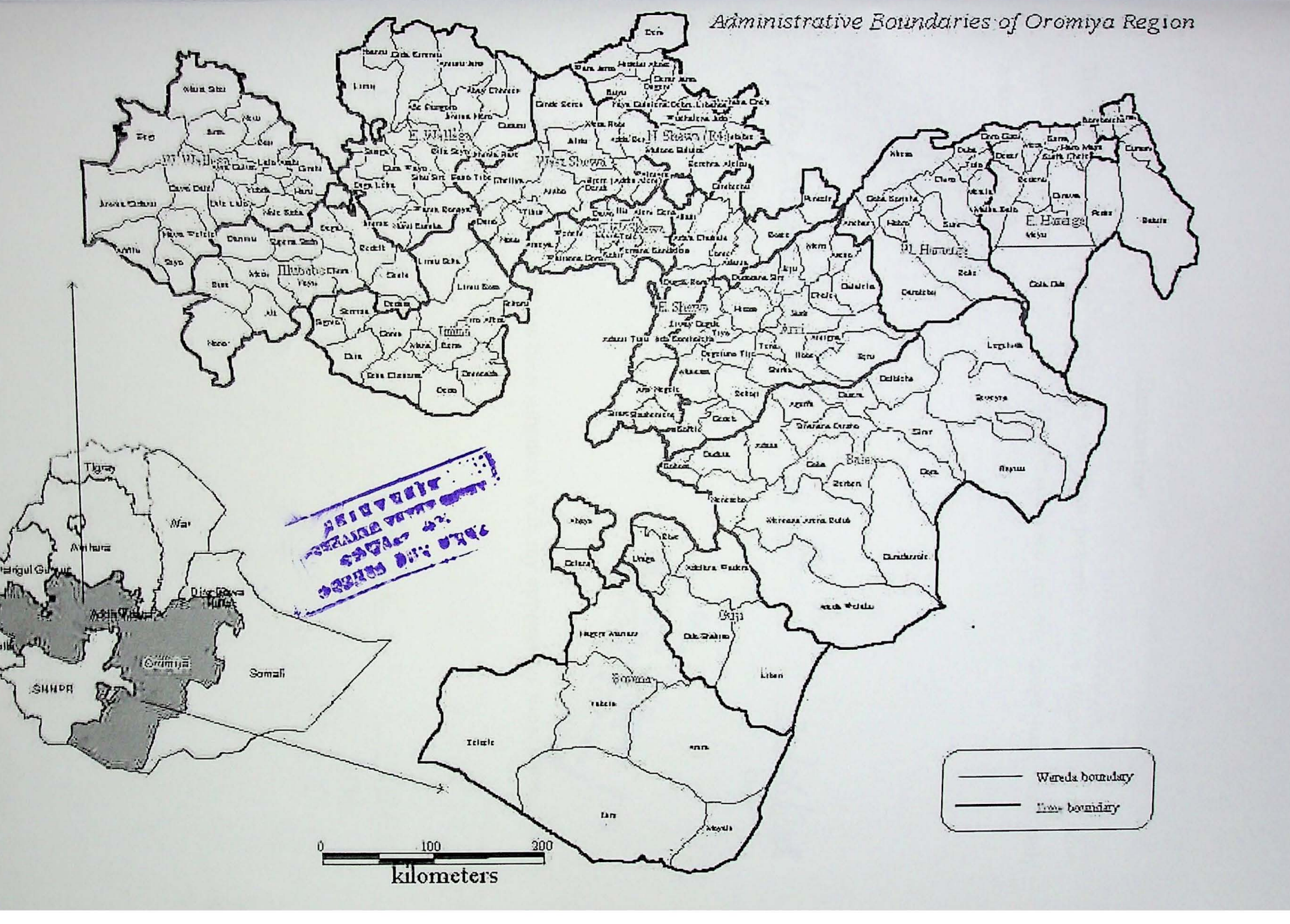
Could you tell me about your breastfeeding experiences?

1. Did you ever breastfeed?
2. For how many months did you breastfeed (last-born children)?
3. Are you still breast-feeding?
4. Can you recall the number of times did you breastfeed last night between sunset and sunrise? (At different age of the child)
5. Did you bring your child to your work place?
6. Do you use feeding bottles to feed your child?
7. Where did you give birth to (Name)?
8. Who assisted with the delivery of (Name) ?
9. How long after birth did you start breastfeeding the newborn after birth?
10. Have you ever used any modern contraception?
11. Do you use modern contraception while you were breastfeeding?

12. Finally, from your experience and in this kebele/Peasant association or Wereda , what do you observe about the tradition of breastfeeding? What problems you encountered while you were breastfeeding.

II. For Health Professionals (Midwives, Nurses, etc) in Health facilities

1. Can you tell me the timing that mothers initiate breastfeeding the newborn infants after birth?
2. Are the mothers allowed to have their infants with them in their beds through out their stay in hospitals/ health station?
3. Are infants given prelacteal feeds, that is any food or drink through bottles other than breast milk, before breast-feeding has been established?
4. Are support and counseling on how to initiate and maintain breast-feeding frequently provided for mothers?


Administrative Boundaries of Oromiya Region
Tigray
Afar
Amhara
Oromiya
Somali
SNNPR
Wereda boundary
Zone boundary
0
100
200
kilometers

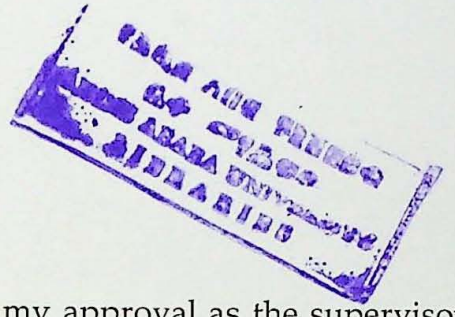
Declaration

The thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

Allene Lisanework — Student

Signature

30/06/2008 — Date



I confirm that this thesis has been submitted with my approval as the supervisor of the same.

SATHIYA SUSUMAN — Advisor

Signature

30/06/2008 — Date