

**KNOWLEDGE OF NEONATAL DANGER SIGNS AND ASSOCIATED
FACTORS AMONG MOTHERS WHO GAVE BIRTH THE LAST FOUR
MONTHS ATTENDING IMMUNIZATION SERVICES IN HARAR TOWN
PUBLIC HEALTH FACILITIES, ETHIOPIA**

MSc THESIS

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Knowledge of neonatal danger signs and associated factors among mothers who gave birth the last four months attending immunization services in Harar town public Health Facilities, Ethiopia

**A Thesis Submitted to the School of Nursing and Midwifery,
School of Graduate Studies
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**In Partial Fulfillment of the Requirements for the Degree of
MASTER IN MATERNITY AND NEONATAL NURSING**

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**February 2017
Haramaya University, Harar**

APPROVAL SHEET
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I hereby certify that I have read and evaluated this Thesis entitled Knowledge of neonatal danger signs and associated factors among mothers who gave birth the last four months attending immunization services in Harar town public Health Facilities, Eastern Ethiopia prepared under my guidance by Fissaha Tekulu. I recommend that it will be submitted as fulfilling the thesis requirement.

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BIOGRAPHICAL SKETCH

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LIST OF ABBREVIATIONS AND ACRONYMS

ANC	Antenatal care
BCG	Bacillus Calmette Guerin
CSA	Central statistical agency
EDHS	Ethiopia demographic health survey
ENC	Essential new born care
HEWs	Health Extension Workers
HC	Health center
HFSUH	Hiwot Fana Specialized University Hospital
HU-IHRERC	Haramaya university institutional health research ethics review committee
IMR	Infant mortality rate
IMNCI	Integrated management of newborn and childhood illness
MCH	Maternal and child health
NMR	Neonatal mortality rate
PAS	Proportional allocation to size
PI	Principal Investigator
PNC	Postnatal care
SBA	Skilled birth attendant
SNNP	Southern nation nationalities and peoples of Ethiopia
SPSS	Statistical package for social science
SVD	Spontaneous vaginal delivery
TBA	Traditional birth attendant
TTBA	Trained traditional birth attendant
UNESCO	United Nations educational, scientific and cultural organization
UNICEF	United Nations Children's Emergency Fund
WHO	World health organization

ABSTRACT

Danger signs in the neonatal period (0-28 days) are nonspecific and can be a manifestation of almost any newborn disease. Early recognition of these signs by mothers is very crucial up on making progress sustainable development in neonatal mortality reduction by increasing care seeking behavior. However, there is limited evidence regarding knowledge of mothers on neonatal danger signs in Ethiopia as well as the study to be conducted in Harar town. The **objective** of this study was to assess knowledge of neonatal danger sign and associated factors among mothers who gave birth the last 4 months attending immunization services. The study was conducted in Harar town public health facilities, Eastern Ethiopia from February 8 – February 29/2017. Quantitative institutional based **cross-sectional study was conducted to study 432 mothers**. Participants were selected systematically from different health institutions. Data was collected through face-to-face interviewer administered questionnaire by 12 data collectors who complete grade 10. The collected data was entered into Epi Data 3.1 and then exported and analyzed using SPSS 20. Results of the study participants were described and presented by using frequencies, percentages, summary measures, tables and graphs. Bivariate and multivariate logistic regression models were used to identify factors associated with the good knowledge of neonatal dangers. Statistical significance was declared at p-value less than 0.05. A total of 432 mothers were participated in the study yielding to a response rate of 98.1%. The knowledge score of neonatal danger sign was found to be 32.9% (95% CI: 28.9%, 37%). It was more known on ANC neonatal danger sign counseled mothers (67%) than not counseled (33%). **Mothers and own husband level of education to secondary level [(AOR=4.9, 95% CI: (1.15, 21), 5.4, 95% CI: (1.3, 22.7)] as well as college and above [(AOR=4.7, 95% CI: (1.15, 19), 4.95, 95% CI: (1.15, 21)] respectively, being multi para mother [(AOR=2.59, 95% CI: (1.05, 6.6)], had PNC visit [(AOR=3.32, 95% CI: (1.26, 8.67)] and being deliverd by ceaserian section [(AOR=3.86, 95% CI: (1.48, 10.3)] were significantly associated with good knowledge of neonatal danger signs. Generaly, about one of the three mothers had good knowledge about neonatal danger signs. Maternal and own husbands level of education, parity, had current PNC visit, mode of delivery and source of information were found to be significantly associated factors. Therefore, awareness creation on neonatal danger signs should be done to increase maternal health care seeking behavior.**

Keywords: Neonatal danger sign, Mothers knowledge, Immunization

1. INTRODUCTION

1.1. Back ground

Parenthood of a new life, a responsibility of protection is important to the health and safety of the little, defenceless person. It is very important that the child is healthy. The symptoms of illness in a new born baby are very subtle. Mother should be watchful for any signs of illness in their new born baby in an endeavour to prevent further complication. Most first time parents don't find comfort in being told how a sick baby reacts compared to a healthy baby. This is because everything about their baby is unfamiliar and new. So that, they don't have any experience with what is normal and what isn't (Vancent, 2011).

Danger signs in the neonatal period (0-28 days) are nonspecific and can be a manifestation of almost any newborn disease. Neonates are more prone to show subtle signs of illness. Lethargy or difficulty feeding are sometimes the only signs present and illness may develop quickly (Baqui *et al.*, 2007).

Neonatal period is a time when parents are concerned about their babies' warmth, food, safety and put hope as well as possibilities, this month can also be the new born is prone to high risk of death, disability including his mother. Moreover, neonatal morbidity due to neonatal infection, notably tetanus, and deaths from complications of preterm birth are increasingly important (Darmstadt *et al.*, 2012).

Different tools to facilitate identification of these health problems and reduce neonatal mortality have been introduced into health programs in several countries. Integrated Management of Newborn and Childhood Illness (IMNCI) developed by the World Health Organization (WHO) focuses on assessment of general danger signs in the examination of neonates presenting with illness at health care centers. The danger signs of severe illness included are 1) Not feeding since birth or stopped feeding 2) Convulsion 3) Respiratory rate of 60 or more (fast breathing); 4) Severe chest in-drawing (difficulty in breathing); 5) Temperature of ≥ 37.5 degree centigrade (fever); 6) Temperature ≤ 35.5 degree centigrade (hypothermia); 7) Only moves when stimulated or not even when stimulated (weakness or lethargy); 8) Yellow soles and palms (sign of jaundice); 9) Umbilicus redness or draining pus, pus (sign of local infection) 10) Vomiting (WHO and UNICEF, 2012). The primary causes of neonatal death are believed to be complications of prematurity (28%), sepsis and pneumonia (26%),

birth asphyxia and injuries (23%), tetanus (7%), congenital anomalies (7%), and diarrhea (3%), with low birth weight contributing to a large proportion of infant deaths (Bryce *et al.*, 2005).

The World Health Organization (WHO) recommends improving care practices at birth in order to reduce neonatal morbidity and mortality. These have been described as essential newborn care (ENC) practices and include clean cord care, thermal care, initiating breast feeding immediately or within the first hour after birth and **counseling** about neonatal danger signs (Marsh *et al.*, 2006).

An increase 1% in female literacy is associated with a 23% drop in newborn mortality rates on average. Effective promotion of ENC at scale could significantly contribute to reducing the leading causes of newborn deaths in low and middle-income countries, especially those due to sepsis/pneumonia, preterm births and tetanus (Marsh *et al.*, 2006).

1.2. Statement of the problem

Neonatal mortality related with lack of knowledge about newborn danger sign caused by neonatal morbidities is still a significant public health problem in the world, which accounts for more than 60% of new-born deaths before their first birthday. Of the world's 7.7 million deaths in those aged younger than 5 years, 3.1 million occurred after birth through the first 28 days of life (neonatal deaths) (Rajaratnam JK *et al.*, 2010).

More than 40% of under-five deaths now occur in the first month of life so called the neonatal period. Thus, progressive sustainable development goal for child survival depends on more effectively addressing neonatal deaths, particularly early deaths in the first week of life through recognition of key neonatal danger signs (Claeson *et al.*, 2009).

Current world wide new born mortality rate is 16.19 per live births. Globally India is country with the highest number of neonatal mortality rate (NMR) which was 69 per 1000 live births in 1980 and significantly dropped to 53 per 1000 live births in 1990. Currently, **However**, the NMR has remained almost static with decreasing only from 48 to 44 per 1000 live births from 1995 to 2007 (WHO and UNICEF, 2012).

Despite the high burden of neonatal mortality, Africa has scored the slowest decrement in NMR with a decline of only 19% from 1990 to 2010 ,when it compare with 43% decline in these high income and developed countries. Africa still accounts for 39% of neonatal mortality with the vast majority of **those** deaths occurring particularly in sub-Saharan Africa (WHO and UNICEF, 2012).

Nigeria is the leading country in Africa with the highest number of neonatal deaths. In Nigeria Annually, more than quarter million neonates die; this translates to approximately 700 neonates every day. New born death accounts beyond 28% of all death in children before reach 5th birth day (Peter *et al.*, 2010).

Around 99 % of neonatal deaths happen in low- and middle-income countries, mostly in sub-Saharan Africa, including Nigeria with the vast majority of these deaths are caused by preventable or treatable disease, such as infectious diseases, which contribute to 36% of these deaths (Lawn, 2012).

Neonatal morbidity and mortality rates in Ethiopia are among the highest in the world and stem from a range of socio-economic, political and demographic factors. Many of these deaths are preventable. Around 120,000 newborns die every year in Ethiopia (Lawn, *et al.*, 2005). According to Ethiopian Demographic Health Survey (EDHS, 2011), neonatal Mortality Rate (NMR) is rate 37 per 1,000 live births and Infant mortality Rate (IMR) is 59 deaths per 1,000 live births for the five-year before the survey compared with 77 deaths per 1,000 live births in 2005. Under-five mortality levels have also decreased from 123 deaths per 1,000 live births in 2005 to the current level of 88 deaths per 1,000 live births (EDHS, 2011).

Nationally, neonatal deaths account for 42% of under-five deaths among the primary cause of death of neonate are birth asphyxia (30%), sepsis (24%), prematurity (23%), and pneumonia (8%) (EDHS, 2011).

Nonetheless, Ethiopian's neonatal mortality rate is still very high when it is compare with neonatal mortality rate of high-income countries with less than 1% of deaths (Rajaratnam *et al.*, 2010). This is due to the fact that knowledge level on those signs of severe illness the so called danger signs of new born by care givers has been under studied, resulting in difficulty making progress to reduce neonatal mortality because of delay in seeking care. In Ethiopia there are only two study conducted, one is community based study in North west (Gondar town) about mothers knowledge, (Solomom *et al.*, 2012) and majority the respondents knew only one danger sign which is poor knowledge, despite the sampling technique used was cluster method which most of the time lose representativeness with many important predictors like Obstetric factors (parity, place of delivery and Birth attendant and mode of delivery) was not took into consideration. Not only this but also community based studies are prone to recall bias. Second study was in Ayder referral hospital in Tigray region, though institutional based samples were small enough, around two hundred, which loses inference (Hadush *et al.*, 2013).

That's why I am intrinsically derived to conduct my research on this area, and ever done such kind of study in Harar town. This will done by making some modification like changing the study to institutional based involving double number of samples on mothers immunize their baby, adding important variables which possibly affect maternal knowledge acquisition and making sampling at random.

1.3. Significance of the study

Improving newborn survival is one part of sustainable development Goal. The greatest gap in newborn is often during the critical first week of life, when most neonatal deaths often occur at home and without any contact with the formal health professional. These conditions can be managed if mothers are aware of newborn danger signs and develop experience of early recognition and health care seeking behavior for newborn illness if routine counseling is provided to overcome knowledge gap. There fore, this study **assessed** knowledge status of mothers about newborn danger signs and factors affecting their knowledge acquisition.

The findings or results obtained from this study can be useful in many ways. Wereda health buero of Harar town and respective Harar public health facilities where the research **was** conducted will take intervention measures and set appropriate plans to improve the existing level of awareness of neonatal danger signs by identifying and taking **corrective** measurement on factors which influences their health care seeking behavior. Furthermore, it is hoped that the study result will helps mothers to have enough knowledge about neonatal danger sign through time, which contribute to neonatal mortality reduction. Moreover, survival chance of neonates is improved if mothers are aware of neonatal danger signs and seek health care early before going serious and lead to death.

1.4. Objective of the study

1.4.1. General objective

- To assess mothers knowledge of neonatal danger sign and associated factors among women who gave birth the last 4 months attending immunization services in Harar town public Health facilities, Eastern Ethiopia from February 8 - 29/2017.

1.4.2. Specific objective

- ✓ To assess mothers knowledge of neonatal danger sign
- ✓ To assess factors influencing mother's knowledge of neonatal danger signs

2. LITERATURE REVIEW

2.1. Mother's knowledge of neonatal danger sign

Mother's knowledge of neonatal danger sign was less than half. About 39% women could able to recognize sign of sick neonate within two year in their family. The most profound danger sign was fever, and the least was abdominal distention which ranges from 3.8% to 72% with 95% CI [0.99–11.45, (60.75–81.37)] respectively, although breathing difficulty and diarrhea were also stated by mothers in great percentage according to the study conducted in India in 2006 (Awasthi *et al.*, 2008).

Similar study was conducted in Nigeria in 2009 using cross sectional design on mothers who had child less than two year, about 4.8% individuals couldn't able to list even one WHO neonatal danger sign. But the vast majority of respondents (95.2%), (93.6%), (78.7%), (30.3%) and (13.2%) exactly knew from one to five neonatal danger signs respectively, while only (2.9%) and (0.3%) correctly listed up to six and seven WHO recognized danger sign respectively. In addition to this 70% mothers were faced with one or two neonatal danger sign in their current child in the neonatal period. The study also showed the most recognized danger sign was fever and the least known was fast breathing which they range from 25.4% -1.7%. In this study they were mothers who list, as least considered danger signs according to WHO, which includes Diarrhea (10.3%), excessive crying (8.1%), and abdominal colic (2.1%). About 47.7% mothers took their neonate immediately after saw considered danger sign to health institution (Ekwochi *et al.*, 2015).

The same type of study from rural Ghana by 2008 indicated that maternal knowledge about danger signs of neonatal illness is 71.9%, and 28% of mothers who mentioned greater than two and three neonatal danger signs respectively. Overall, Mothers who did not know that Yellow palms, redness of umbilical stump, and unconsciousness as neonatal danger signs were 93.6%, 95.1% and 92.3% respectively (Lem and Yidana, 2014).

A similar survey study in Egypt by 2008 indicated that mothers have satisfactory and good awareness about neonatal danger signs which ranges from (68-70%) whom able to mention from 8 to 9 warning signs that needs urgent attention of health professional. The most frequently mentioned danger sign was fever 94.8% followed by Lethargy and Hypothermia 90.9% &70.3% respectively (Rasha *et al.*, 2010).

Indeed, Knowledge of one and two WHO recognized danger sign in rural Uganda in 2011 was present in 58.3% and 14.8% sequentially. Fast or difficulty breathing and fever were the most prominently recognized neonatal dangers sign listed by about 30% and 20% of all women respectively. Convulsions, movement only when stimulated and hypothermia were among the least known neonatal danger sign stated by less than 5% of the respondents. It also showed that there is no significant association between socio demographic characteristics and knowledge of at least one WHO neonatal danger sign (Sandberg *et al.*, 2014).

The study conducted in four regions of Ethiopia by 2010, (Oromia, Amhara, SNNP and Tigray) about knowledge of neonatal dangers signs indicated that, mothers were less to recognize the WHO neonatal danger sign. About 29.3% with 95% CI [23.5, 35.0] mothers were aware of and could able to list three (3) neonatal danger sign out of ten without prompt. Poor feeding/ suckling / was the most frequently stated and yellow palm/eye/ sole is the least frequently stated neonatal danger signs which ranges from(39.5%-0.4%) with the promoted neonatal danger signs. Mothers who faced neonatal illness during the neonatal period, vomiting (30.6%), inability to feed/suckle (22.0%), difficult/fast breathing (21.8%), and fever (12.1%) are among the commonly stated promoted neonatal danger signs and half of them are taken to health facility (Koru *et al.*, 2013).

Study in Gondar by 2012, also showed that the mothers who had good knowledge of neonatal danger signs were only 18.2%, (95% CI 15.1 to 21.3).But the other 79% of mothers recruited knows only one danger sign. Mothers who only recognize at least one danger sign responded (39.8%), (34%), (27%), (17.2%), fever, vomiting, diarrhea, unable to feed respectively. The most common source of knowledge mention was health professionals, 36.7 (Solomon *et al.*, 2015).

Results from the study in Tigray region Ayder referral hospital by 2010, on mothers attending immediate postnatal visit showed that only 64% mothers knew three WHO recognized neonatal danger signs at the same occasion. From the mothers only stated one dangers sign which ranges from the least jaundice and fast breathing to the higher fever (0.34-13%), (Hadush *et al.*, 2013).

2.2 Factors affecting mother's knowledge about neonatal danger signs

2.2.1. Socio demographic characteristics

Poor knowledge of mothers was strongly associated with being a young age nursing mother, according to studies in India and central Bangalore in 2009 (Mamta, 2013). Another study in Finche town, Oromia region by the year 2015, showed also Women who had poor knowledge of warning signs of neonate, [AOR: 0.158, (95% CI: 0.085-0.293)], were those in the age group fifteen to eightin, [AOR: 142.7, (95% CI: 5.249-3880)], (Yeshiwork, 2015). But studies from Egypt in 2008, showed being a rural women (AOR= 1.77; 95% CI (1.53-2.72), were prone to score poor knowledge of neonatal warning sign (Rasha *et al.*, 2010). Whereas, the study in Gondar in 2012, reviled Mother's and own husband education had association with recognition of neonatal danger signs (AOR = 3.05, 95% CI 1.43, 6.50) & (AOR = 3.89, 95% CI 1.29, 11.71), for secondary as well as (AOR = 3.41, 95% CI 1.37, 8.52) & (AOR = 3.91, 95% CI 1.23, 12.36) for college and above comparing to those not took formal education respectively. Over all, mothers education to those of not taking formal education up on recognizing >3 danger sign was 18% and 8% respectively. Though the finding of study did not show any significance association between good maternal knowledge, the researches tried to address the effect of marital status, maternal occupation (Solomon *et al.*, 2015).

2.2.2. Maternal health service exposure

Mothers who had antenatal care visit (ANC) were more likely to have good knowledge compared with those who had never routine antenatal care visit (61.4% vs 41%) $p < 0.001$ according to the study conducted in Egypt by 2008 (Rasha *et al.* 2010). Similarly study in Finche town, Oromia regional state in 2012, indicated that mothers who have antenatal care visit (ANC) in the last pregnancy (16%) are more likely to knew greater than three neonatal danger signs (AOR = 2.28, 95% CI 1.05, 4.95) than that of not had ANC follow up (2%). Women who didn't have counseling at antenatal, [AOR: 0.492, (95% CI: 0.245-0.987)], were found significant predictors on poor level of Knowledge about neonatal danger sign (Yeshiwork, 2015). Similarly mothers with postnatal care visit (PNC) in earlier and current pregnancy had good knowledge of neonatal danger sign (AOR = 2.08, 95% CI 1.22, 3.54) than ever follow. Mothers who delivered thir current babyin hospital had good knowledge of neonatal danger signs (AOR=2.17, 95% CI: (1.34, 3.52) than those who deliverd in health center. Though the researcher did not found any significant association with maternal knowledge, and delivery assistant were studied (Selomon *et al.*, 2015).

2.2.3. Obstetrics factors

Parity had significant association with mothers' knowledge on newborn danger signs according to study conducted in India at maternity centers of Madurai Corporation and Sir- Lank by the year 2009 (Senarath *et al.*, 2011). But the study in Egypt in 2008 showed, mothers being primiparae are more likely to have poor knowledge about newborn danger signs than multi parity which is (AOR) = 1.62 95% CI 1.43-2.12) (Rasha *et al.*, 2010).

2.2.4. Source of information

Source of information had significant association with recognizing the key danger signs. Poor knowledge was associated with women who had acquired their knowledge from sources other than health workers according to the study in India in 2012 (Jiji *et al.*, 2014). Similarly information acquired from health professional is 36.7% which is higher beyond all sources. Information gained from television had statically significant association with increased knowledge of greater than three danger signs (AOR = 3.49, 95% CI 1.30, 9.39). Although not significantly associated, 2.4% mothers who gained information from radio also have good knowledge based on the study in Gonder. In this study proportion of mothers had media access to those of not was 32% to 43% (Selomon *et al.*, 2015).

2.2.5. Maternal new born care knowledge and practice

Maternal new born practice specially cord care was found strongly associated with maternal knowledge of new born danger sign according to the study in Chitwan district by 2011 (AOR=0.10, 95% CI=0.02-0.41). The study also showed 52% mothers breastfeed within one hour and 96.6%, 95%, 99.4% mothers had good practice of baby bathing, clean cord tying and cord application respectively would have better awareness on neonatal danger signs (Chaudhary *et al.*, 2013).

2.3. Conceptual frame work

This is the conceptual frame work developed specifically for this study by the principal investigator through reviewing related literatures. The frame work emphasizing on the need to focus on major determinants of mothers' knowledge (recognition) about neonatal danger sign.

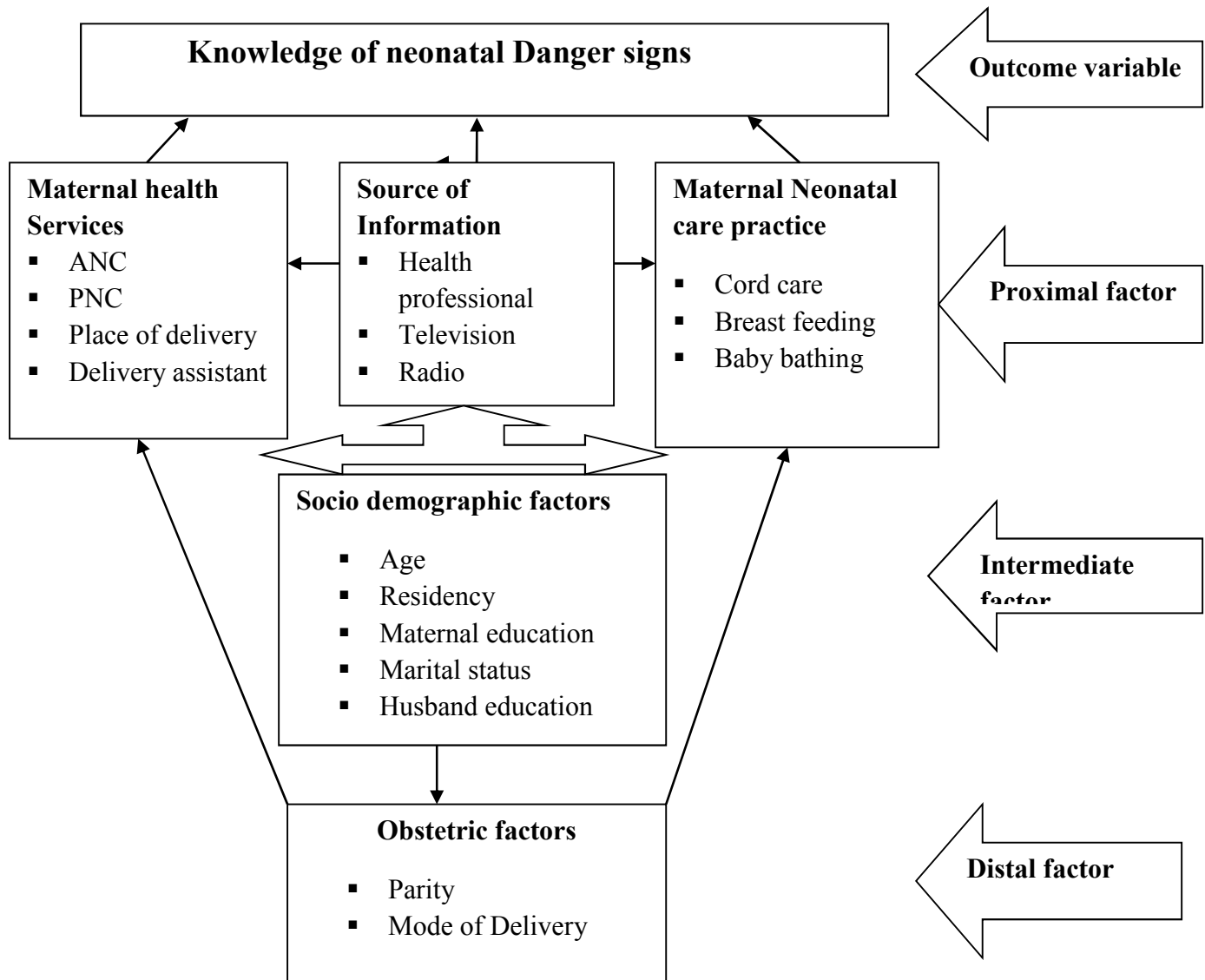


Figure 1 Conceptual framework for knowledge of neonatal danger signs and associated factors among mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia. February 2017.

Source: Constructed by the investigator from the literatures included in the study

3. METHODOLOGY

3.1. Study area and period

Harar town is the administrative center of Harari region in Eastern part of Ethiopia with a total distance of 526 km to the East Addis Ababa, the capital city of Ethiopia. The town is bounded by Kombelcha to the East, Mierab Harargie to the West, Gube Selama to the South and Awaday to the North. The climate condition of the town is “weinadega” and its annual rainfall is about 850ml mm. Based on the 2007 Census, the total population of Harari regional state was 183,415 living on 311.25 square kilometer out of which females account 91, 099 (Harar town municipality, 2016). Regional infant mortality rate is 66 infant deaths per 1,000 live births, half of which are dead within the first month (CSA, 2008). The town has 19 kebele (lowest administrative unit) which are divided into six districts. In the region, there are six hospitals (2 public, 2 private and 2 military), 18 private for-profit clinics, 8 health centers, four of which are rural and the other four are urban and 26 health posts (Harar town health office, 2016).

The study was conducted in two Harar town public **hospitals** (i.e. Hiwot Fana Specialized University Hospital (HFSUH), Jugal Hospital and four health centers. **(namely, Aboker, Jenella, Amirnur and Aratenga)** of Harari regional state from February 8 - 29/2017. Through these health facilities different maternal and child health (MCH) are being provided. The main services include child vaccination, ANC, labor and delivery services, PNC.

3.2. Study design

Quantitative institutional based cross-sectional study design was applied

3.3. Population

3.3.1. Source population;

All mothers who gave birth the last four months and attending baby immunization in Harar public health facilities.

3.3.2 Study population;

Those mothers who gave birth the last four months and attending baby immunization during the data collection period

3.3.3. Study unit; Individual (Mother)

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion criteria

Mothers who gave birth the last 4 four months and coming to immunize their babies

3.4.2. Exclusion criteria

Mothers who gave birth the last four months with health problem (deafness, urgent illness) or else that makes communication difficult to get the necessary data and care givers (Maid servant, Grandmothers) immunize their employer's baby were excluded from the study.

3.5. Sample Size Determination

3.5.1. Sample Size Determination for the First Objective

The required sample size for this objective would be determined using formula for single population proportion ($n = (Z_{/2})^2 pq/d^2$) and summarized (in table 1) below from different studies with the following assumptions:

- Confidence level at 95% =1.96
- Margin of error = 0.05

Table 1 Sample size calculation for the knowledge of greater than three neonatal danger sign.

Knowledge of > 3 danger sign	Calculated sample size	Reference
39%	366	Awasthi <i>et al.</i> , 2008, India
78.7%	258	Ekochi <i>et al.</i> , 2015, Nigeria
28%	310	Lem and Yidana. 2014, Ghana
29.3%	319	Koru <i>et al.</i> , 2013, 4 regioes of Ethiopia
18.2%	229	Selomon <i>et al.</i> , 2015, Gondar

3.5.2. Sample Size Determination for the Second Objective

Double population proportion formula was used to determine the sample size for the factors associated with knowledge of danger sign. Sample size was calculated for some of the associated factors obtained from different literatures by using the Statcalc of Epi Info statistical software version 7 with the following assumptions:

- Confidence level = 95%
- Power = 80%
- The ratio of unexposed to exposed almost equivalent to 1

Table 2. Sample size calculation for different factors associated with maternal knowledge of neonatal danger signs

Variable	Knowledge of danger sign		Sample Size	Reference
	Exposed	Non-exposed		
Maternal education	18% (primary level and above)	8% (unable to read and write)	394	Selomon <i>et al.</i> , 2015, Gondar

ANC	61.4%(4 times)	41% (ever had)	206	Rasha <i>et al.</i> , 2010 Egypt
Media	32% (Tv& radio)	4.3% (None)	74	Selomon <i>et al.</i> , 2015, Gondar

Generally, sample sizes were calculated for the first and the second objectives and the largest sample size was found to be 394 from the second objective. By adding 10% for the non-response rate, the final sample size becomes **433**.

3.6. Sampling Procedure

The town had six public health institutions with two hospital and four health centers. The average of three month immunization services up to 4 month in Hiwot fana university specialized hospital, Jugela hospital, Aboker, Jenella, Amir nur and Aratenga health centers was 132, 77,105, 125, 86 and 93 respectively. Therefore, proportional allocation to size was done to get the total 433 samples from every health institutions followed by consecutive sampling technique up to get the required respondents.

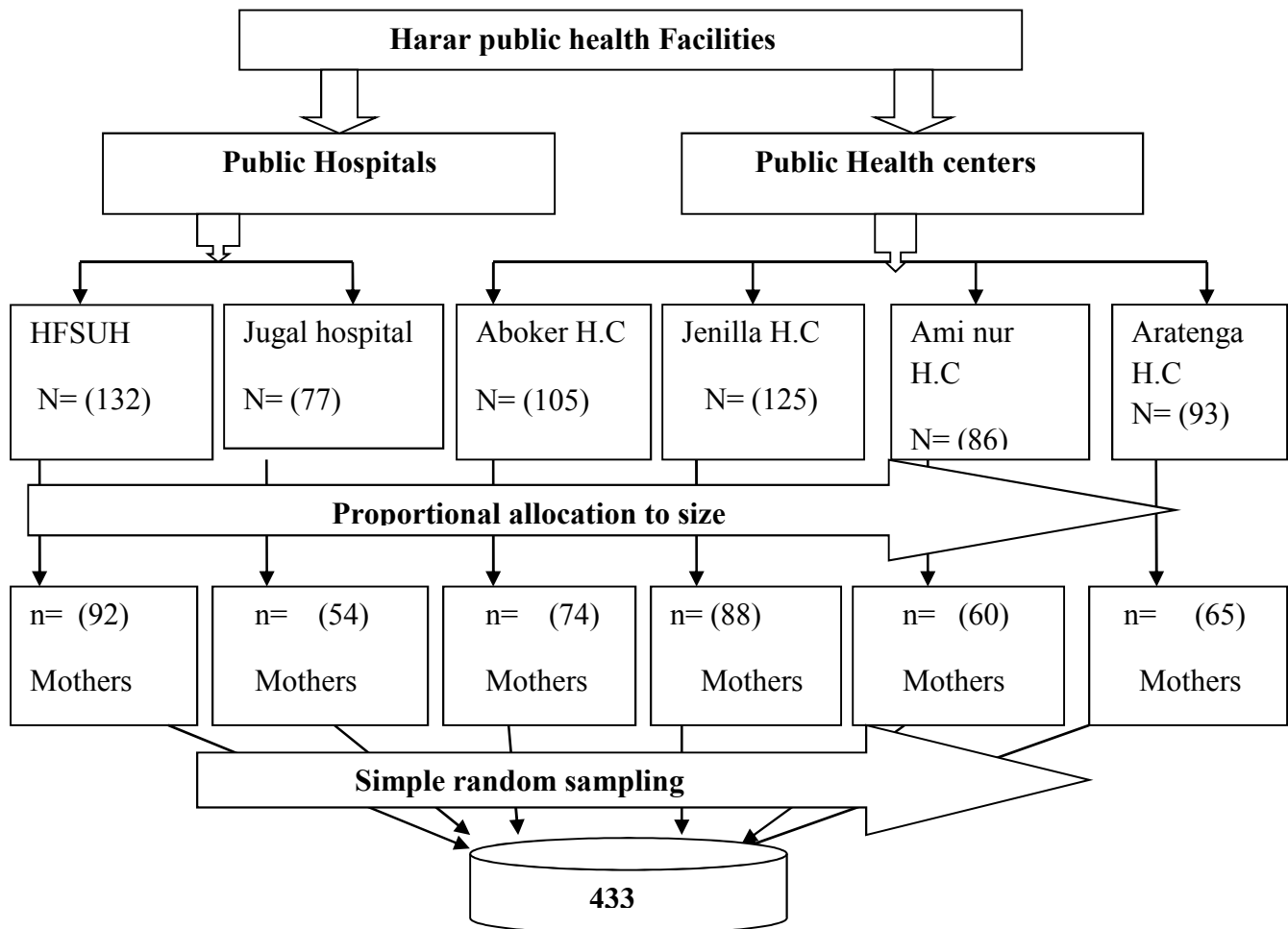


Figure 2 Schematic presentation of sampling procedure for the study to be conduct in Harar public health facilites from February 8- 29 11/2017.

3.7. Data Collection Methods

Structured face to face interviewer administer questionnaire developed by the principal investigator and **checked** it's consistency by advisors was applied for this survey. The questionnaire was first prepared in English language and then translated to Amharic and Afan Oromiffa. An Interview technique was employed for the selected respondents in the selected health facilities. Explanation was given on the purpose of the study and importance of their involvement then respondents who were volunteered were interviewed face- to- face using structured and pretested questionnaires. Twelve grade 10 completed students that know and speak both languages were recruited as data collectors and got training on objective of the study, method of data collection and discussed thoroughly on the tools prepared for data collection. Two Bsc midwifes supervisors were trained by the principal investigator. During the training days explanation was given on the purpose of the study and discussed on the tool designed for data collection, how to implement, potential problems that could arise and how to solve them. The data collectors were organized in to five pairs to minimize bias and errors during the data collection. The respondents were contacted on immunization department before or after immunize their baby.

3.8. Study Variables

3.8.1. Dependent Variable

Mothers' knowledge of neonatal danger signs

3.8.2. Independent Variables

Socio demographic characteristics: maternal age, maternal marital status, maternal educational, maternal occupation, Husband educational status and maternal residency.

Source of information: Media (TV & Radio), Heath professional, Neighbor, Reading books, magazines and family or friend.

Maternal health service exposure: ANC, PNC, Place of delivery, Birth attendant

Obstetric factor: Parity, mode of delivery

Maternal new born care knowledge and practice: Cord care, bathing, breast feed practice, immunization and insecticide treated bed net usage

3.9. Operational Definitions

Key danger signs: Are those signs which warrant survival chance of a neonate and demands immediate medical care. Thus, 1) Not feeding since birth or stopped feeding 2) Convulsion 3) Respiratory rate of 60 or more (fast breathing); 4) Severe chest in-drawing (difficulty in breathing); 5) Temperature of ≥ 37.5 degree centigrade (fever); 6) Temperature ≤ 35.5 degree centigrade (hypothermia); 7) Only moves when stimulated or not even when stimulated (weakness or lethargy); 8) Yellow soles (sign of jaundice); 9) Umbilicus redness or draining pus, skin boils, or eyes draining pus (sign of local infection) 10. Vomiting. (WHO and UNICEF 2012)

Good knowledge: A mother who asked to mention key danger signs of neonate, if she can mention three of the ten key danger signs for neonate without prompt and three and greater danger signs with prompt (WHO 2005; Lancet 2008).

Poor knowledge: A mother capable of mentioning two and less key danger signs of neonate with and without prompt. (WHO 2005; Lancet 2008)

Neonatal period: Is a time from birth up to the first 28 day of life

Parity: is to mean how many live birth the mother had

Primiparae: Is mother who has live birth for the first time

Recently delivered woman: In this study recently delivered women defined as women who delivered prior to 4 months of the survey irrespective of how many birth gave before

3.10. Data Quality Control

The questionnaire was translated into the local language i.e. Amharic and Afan oromiffa for data collection and then retranslated back into English. One day training was given to the data collectors and supervisors on the data collection tool and the data collection procedure. Then the questionnaire was pretested prior to the study period on 5% of the sample size out of the study area (Haramaya hospital) to ensure its validity, Consistency and to avoid possible information contamination to the real respondents. Data collectors were supervised closely by the supervisors and the principal investigator. Completeness of each questionnaire was checked by the principal investigator and the supervisors on

daily basis. Double data entry was done by two data clerks and consistency of the entered data was cross checked by comparing the two separately entered data on EpiData. Finally, multivariate analysis would run in the binary logistic regression model to control the confounding factors.

3.11. Data Processing and Analysis

The data was first coded, entered and cleaned using EpiData statistical software version 3.1 and then exported into SPSS statistical software version 20 for analysis. Descriptive statistical analysis such as simple frequencies, measures of central tendency and measures of variability was used to describe the characteristics of participants such as socio demographic, maternal health service exposure, obstetric factors, maternal source of information, maternal newborn care knowledge, practice and maternal knowledge. Then the information was presented using frequencies, summary measures, tables and figures. Knowledge was measured by mother's capability of mentioning neonatal danger sign with and without prior prompt by the interviewer. Then knowledge was categorized into good knowledge and poor knowledge. HosmerLemshow and Omnibus tests were done to test for model fitness. In the Hosmer-Lemeshow test, the Pearson's chi-square was not significant but significant in Omnibus test means, the model was already fitted. Bi-variate analysis was used to see the association between each independent variable and the outcome variable by using binary logistic regression. All variables with $p\text{-value} \leq 0.2$, variables scientifically sound and variables which had strong association in previous studies were taken into the multivariable model to control for all possible confounders and the variables were selected by backward stepwise technique. Multi co-linearity test was carried out to see the correlation between independent variables using variable inflation factor (VIF) and one of the independent variable was dropped for those with VIF of > 10 . Odds ratio was used as the primary measure of strength and direction of the relationship between the independent variables. Adjusted odds ratio along with 95% CI was estimated to identify factors associated with maternal knowledge of neonatal danger signs using multivariate analysis in the binary logistic regression. Level of statistical significance was declared at $p\text{-value} \leq 0.05$.

3.12. Ethical Considerations

Before starting of the data collection process, ethical clearance was secured by Haramaya University Institutional Health Research Ethics Review Committee (IHRERC). Official letter was written from Haramaya University College of health and medical sciences to each selected health facilities. Informed, written and signed consent was obtained from each participant after explaining the purpose

and benefits of the study. Participants were informed about the minimal risk that it had participating in the study, their voluntariness and the right to stop the interview at any time they want. Confidentiality of the study participants' information was also ensured. Eventually mothers who had poor knowledge were informed about the 10 key danger signs prompted in the questionnaire immediately after the interview is finished.

3.13. Information Dissemination

The report of the study will first be submitted and presented to Haramaya University, and then the hardcopies and soft copy of the report will be given to Harar Health Offices, and head of each facility the study conducted respectively. Attempt will be made to present on national and international conference and workshops. Besides, publication on peer-reviewed journal will be considered.

4. RESULT

4.1. Socio-demographic characteristics

A total of 432 mothers of babies aged up to 4 months were included in the study with a response rate of 99.8%. The median age of the mothers was 25 years with a range of 15-45 years. About 428 (98.8%) of them were married and 298 (68.9%) of them attended formal education. Majority, 261 (60.4%), of the mothers were House wife, 206 (47.7%) were Muslim in religion and 199 (46.1%) were Oromo in their Ethnicity. Out of 428 married mothers, 353 (81.7%) their husbands had formal education. (Table 3)

Table 3. Sociodemographic characteristics of mothers who gave birth the last 4 months attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017

Variables		Frequency	Percentage
Maternal religion(n=432)	Muslim	206	47.2
	Orthodox	188	43.5
	Catholic	4	0.9
	Protestants	34	7.9
Maternal level of education (n=348)	No formal education	50	14.4
	Primary level	120	34.5
	Secondary level	83	23.9
	College and above	95	27.3
Maternal marital status (n=432)	Single	—	—
	Married/partner	427	98.8
	Divorced/separated	5	1.2
	Widowed	—	—
Husband educational status (n=428)	No formal education	75	17.5
	Primary level	159	37.1
	Secondary level	106	24.8
	College and above	88	20.6
Maternal age (n=432)	<18 year	7	1.6
	18-31 year	381	88.2
	>31 year	44	10.2
Maternal residence(n=432)	Urban	408	94.4
	Rural	24	5.6
Maternal occupation (n=432)	Governmental employee	56	13
	Private employee	47	10.9
	House wife	261	60.4
	Merchant	34	7.9
	Other	34	7.9

4.2. Knowledge of neonatal danger signs

Among the recruited 432 mothers who gave birth in the last 4 months and attending baby immunization, 130(30.1%) don't know about neonatal danger signs totally but the remaining 302(69.9%) mothers are aware of neonatal danger sign and could able to mention ranging from one to three and above neonatal dangers signs as follows.(Table 4)

Table 3 Knowledge of neonatal danger signs without prior prompt among mothers who gave birth the last four month attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017

Variable		Frequency	Percentage	
Knowledge of neonatal danger signs (n=432)	No	130	30.1	
	Yes	One	60	13.9
		Two	100	23.1
		Three and above	142	32.9

The proportion of mothers who mention at least three (3) neonatal danger signs without prior prompt and three and above with prior prompt simultaneously (i.e. WHO, 2005 and Lancet 2008,) was found to be 142 (32.9% with 95% CI: 28.9%, 37%).

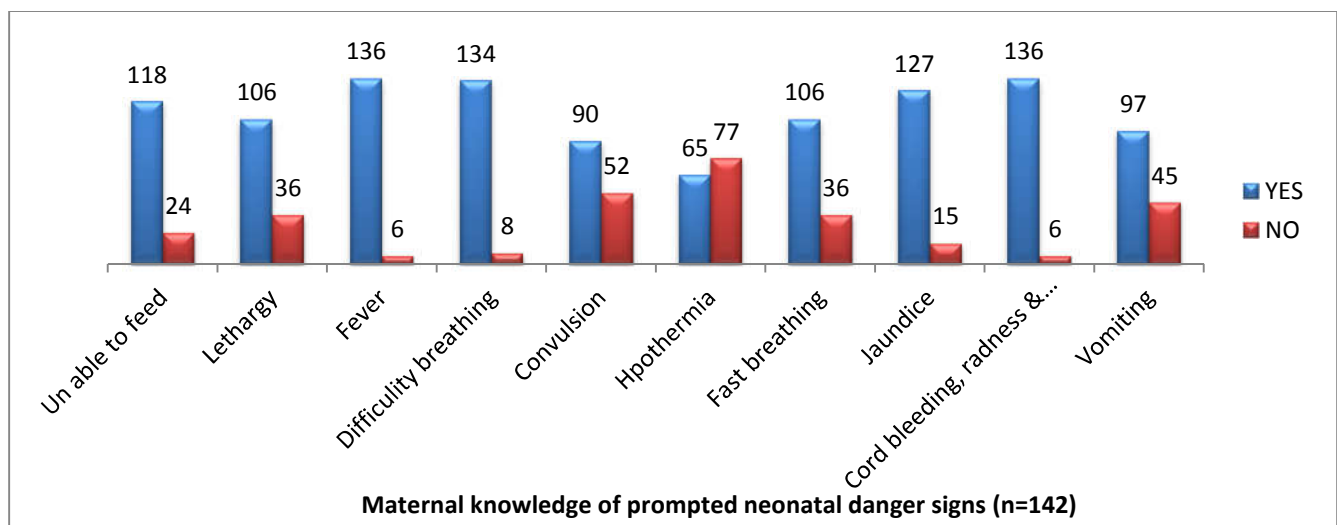


Figure 3 knowledge of prompted neonatal danger signs among mothers who gave birth the last four months attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017

Among the prompted neonatal danger signs mentioned, cord bleeding, redness, pus and fever accounts 95.8% followed by difficulty breathing, jaundice and unable to feed 94.4%, 89.4%, 83.8% respectively. Hypothermia, convulsion and vomiting are the least mentioned neonatal danger signs accounting for 45.8%, 63.4% and 68.3% respectively. In addition to this most of the respondents 52(36.6%) recognize 8 out of 10 priority prompted neonatal danger signs, followed by 41(28.9%), 18(12.6%), 17(12%), 12(8.4%) and 3(2.1%) mentioning 7, 9,10,6 and one neonatal danger signs respectively.

4.3. Maternal health service and obstetric conditions

Out of 432 mothers 393(90.9%) had ANC follow up during the last pregnancy for whom the baby they vaccinate at the time of survey. Among the mothers who had ANC follow up visit majority of them 285(72.5%) were seen by Nurse /midwife proceeded by Doctors, health officer and health extension worker accounting for 87 (22.1%), 17(4.2%) and 4(1%) sequentially. But, 354 (81.9%) respondents were only received regular ANC counseling, provided that HIV awareness related counseling was the most covered area 88% followed by family planning and hygiene equally cover 79.4%, and counseling related to neonatal danger signs were the least of all area of counseling covered with 34.2%. Similarly, out of 432 mothers less than half, 133(30.8%) had postnatal care visit (PNC) and only 70(52.6) mothers got counseled about neonatal danger signs. Among PNC visit attendants 69(51.9%) were nurse/midwives followed by Doctors and health officers 48(36.1%), 14(10.5%) respectively. Two mothers were only visited by health extension worker (HEW) at their home.

Table 4 Antenatal care service utilization and obstetric conditions of mothers who gave birth the last four month attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017

Variable		Frequency	Percentage
Recent ANC follow up (n= 432)	Yes (n=393)	One	42
		Two	94
		Three	96
		Four and above	161
	No (n=39)		9
Parity (n=432)	Primi para (1)	188	43.5
	Multi para (2-4)	226	52.3
	Grand multi para(≥5)	19	4.2
Mode of delivery (n=432)	Spontaneous vaginal delivery	248	43.5
	Instrumental delivery	36	8.3
	Caesarian section	148	34.2

Concerning to the Mode of delivery majority, 248(43.5%) mothers delivered by spontaneous vaginal delivery, similarly, the median parity of mothers was 2, ranging from 1- 8 live birthes with multi para mothers (226(52.3%) accounted the highest number in the parital status of the respondents. (Figure 5)

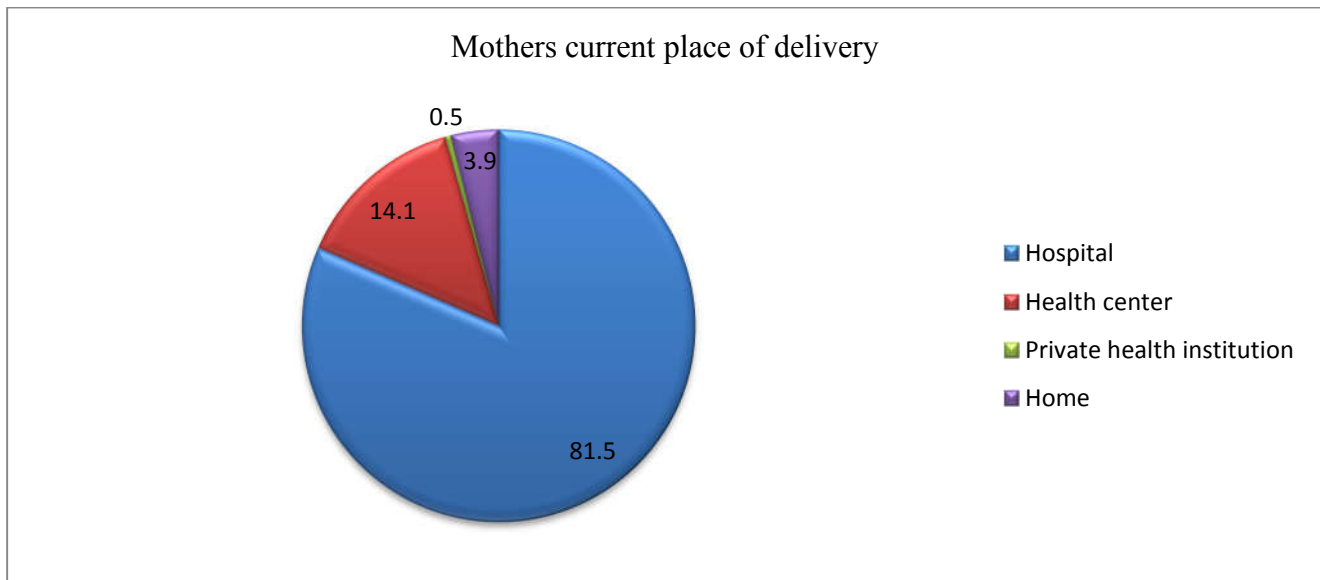


Figure 4 Place of delivery of mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n=432).

Related to the place of delivery the majority of mothers 352 (81.5%) delivered their current baby in hospital, and very few mothers 2(0.5%) visit private health institutions for labor and delivery. Congruently, the proportion of mothers who were being assisted their labor by health professionals accounts 415(96.1%) followed by trained traditional birth attendant (TTBA) 10(2.3%), health extension workers 4 (0.9%) and 3(0.7%) by relative/ friends.

4.4. Source of information

Concerning the source of information 253(83.8%) mothers from these who were aware of neonatal danger signs got informed from different source and among these 81 (31%) received their first sources from health professionals, while the remaining 49(16.2%) mothers were not informed.

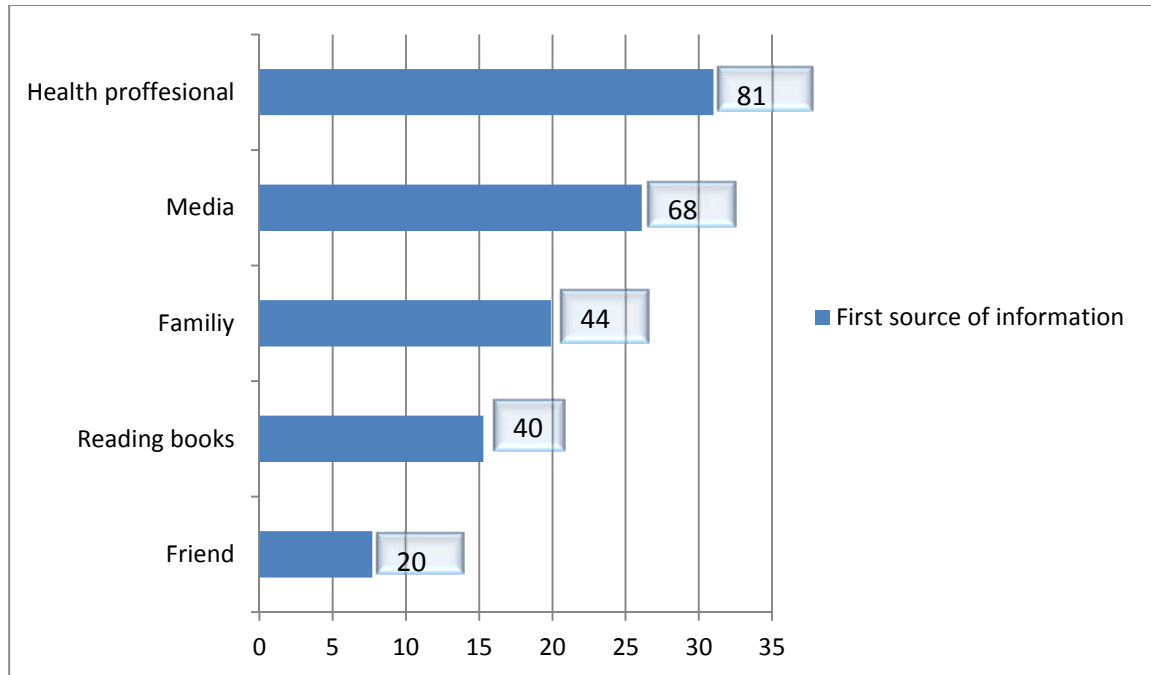


Figure 5 First source of information about neonatal danger signs for mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n=253).

Out of the 68 (22%) mothers who acquired their first source from media, 47 (69.1%) of them received through watching television, comprising 38(80.9%) watch TV always, 9(19.1%) Heath program only, while the remaining 21(30.9%) respondents were from listening to radio.

4.5. Maternal new born care knowledge and practice

From a total of 432 respondents, the proportion of mothers who had knowledge about cord care were 280 (64.8%) out of whom 165 (38.2%) reported sterile cord clasper as their main cord tie material, but the rest 92 (21.3%) mothers don't know what to use followed by other unsterile materials 23 (5.3%).

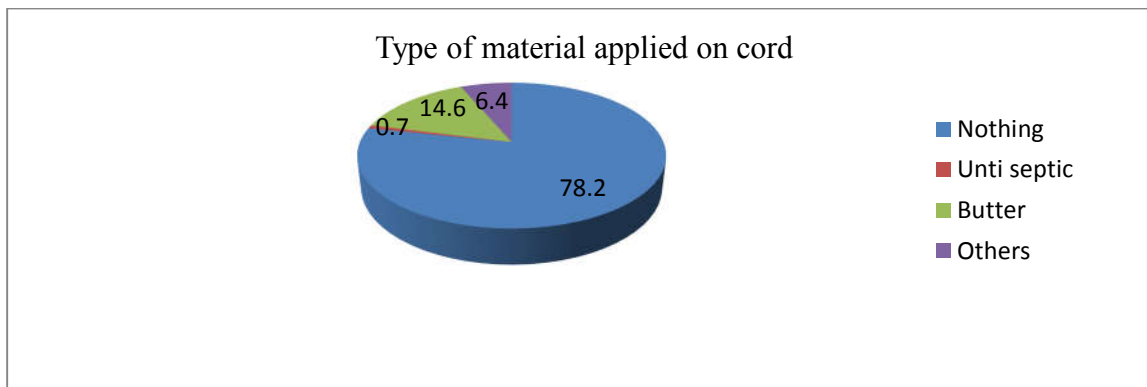


Figure 6 Cord apply practice of mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n=280).

Concerning the maternal neonatal care practice, out of the total 432, respondents about 306(70.8%) reported as the exact time of breast feeding initiation is within 1 hr, while less than half 153(35.4%) mothers claimed the exact time of baby bath is within 24 hr.

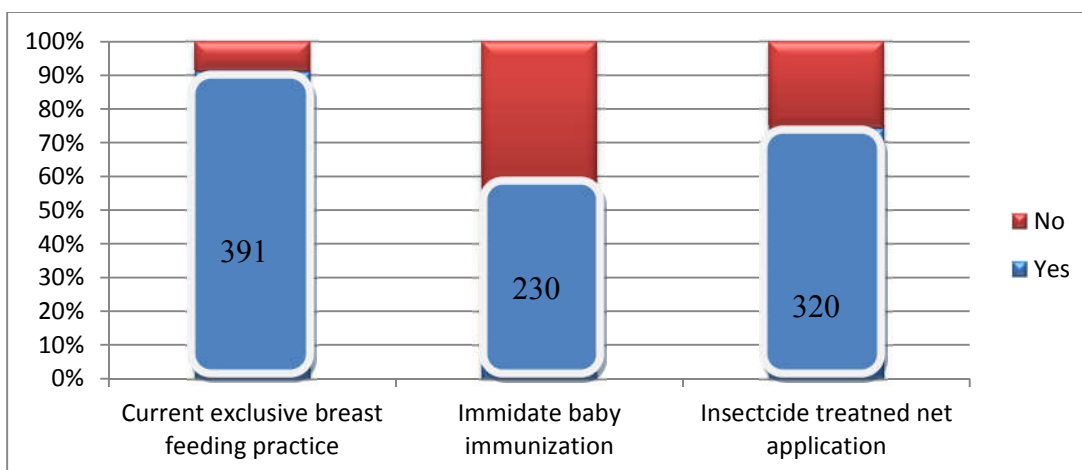


Figure 7 Newborn care knowledge and practice of mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n=432)

4.6. Factors Associated With knowledge of neonatal danger signs

4.6.1. Results of Bi-variable Logistic Regression Analysis

Mothers with educational status of collage and above [(COR= 3.99 95% CI :(1.86, 8.6)] and secondary level [(COR= 2.7 95% CI :(1.22, 5.83)] were more likely to know about neonatal danger sign than mothers not had formal education. Similarly mothers whose husband was educated to collage and above level [(COR=3.4 95% CI :(1.72, 6.75)] and secondary level [(COR=2.33 95% CI :(1.19, 4.53)] were more likely to recognize neonatal danger sign than that of those who didn't took formal education. Mothers who got informed about neonatal danger signs for the first time through health professional [(COR=4.6 95% CI :(2.1, 10.6)] and media [(COR=3.5 95% CI :(1.6, 7.9)] were more likely to know about neonatal danger signs compared to that of friend. Grand multipara and multipara mothers found to be more knowledgeable about neonatal danger signs [(COR=6.17 95% CI: (2.19, 17.4)], [(COR=1.9 95% CI: (1.2, 2.9)] respectively compared to Primi para mothers. Mothers who had routine antenatal care visit (ANC) for their latest baby [(COR=2.39, 95% CI: (1.03, 5.56)] were more likely to know about neonatal danger signs than who don't had. Beside to this, those who had four times [(COR=3.9 95% CI: (1.76, 8.7)] and three times visit [(COR= 2.4 95% CI :(1.03, 5.6)] were more likely to know neonatal danger signs compared to those who visited once throughout the gravid state. Similarly Mothers who had postnatal visit (PNC) within six days [(COR=3.3 95% CI :(2.16, 5)] were more likely to know about neonatal danger signs than those who didn't. Mothers delivered their latest baby though caesarian section [(COR= 4.5 95% CI: (2.9, 7)] were more likely to know about neonatal danger sign compared to those whose mode of delivery was spontaneous vaginal delivery (SVD).

4.6.2. Results of Multivariable Logistic regression analysis

Educated mothers to the level of college and above as well as secondary level were more likely [(AOR= 5.4 95% CI: (1.3, 22.7)], [(AOR= 4.9 95% CI: (1.15, 21.1)] to recognize neonatal danger signs compared to those who didn't took formal education. Mothers who had postnatal follow visit up to six days postpartum period were more likely [(AOR= 3.32 95% CI: (1.26, 8.67)] to know neonatal danger signs than those who didn't ever visited.

The study also showed that mothers who was delivered through caesarian section for their current baby [(AOR= 3.9 95% CI: (1.46, 10.2)] were more likely to know about neonatal dangers signs compared to those who delivered through spontaneous vaginal delivery.

Mothers who recognize the exact time for initiation of breast feeding as less than one hour [(AOR= 3.23 95% CI: (1.11, 9.7)] were more likely to know about neonatal danger signs than those who reported as breast feeding initiation after one hour. The finding of the study showed that mothers who get counseled about neonatal danger signs up on their ANC visit for the latest baby were more likely[(AOR= 4.34 95% CI: (1.61, 11.7)] to know similar circumstances happening on newborn babies. (Table 6)

Factors associated with knowledge of neonatal danger signs among mothers who gave birth the last four month attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017

Independent variables	Frequency (%)	Knowledge of neonatal danger signs		COR (95% CI)	AOR (95% CI)
		Good	Poor		
Maternal level of education					
College and above	95 (27.3)	53	42	3.99 (1.86, 8.6) **	5.4 (1.3, 22.7)*
Secondary level	83 (23.9)	38	45	2.7 (1.22, 5.83)*	4.9 (1.15, 21.1)
No formal education	50 (14.4)	12	38	1.00	1.00
Time of breast feeding initiation					
<1 hr	306 (70.8)	113	193	1.87(1.17, 3)**	3.23 (1.11-9.7)
>1 hr	126 (29.2)	30	96	1.00	1.00
Husband/partner level of education					
College and above	88 (20.6)	44	44	3.4 (1.72, 6.75)**	4.95 (1.15, 21.32)**
Secondary level	106 (24.8)	43	63	2.34 (1.2, 4.53)*	4.7 (1.15, 19.23)
No formal education	75 (17.5)	17	58	1.00	1.00

Parity						
Primi para	188(43.5)	46	142	1.00		1.00
Multi para	226 (52.3)	85	141	1.9 (1.2, 2.9)**		2.59 (1.05, 6.58)*
ANC neonatal danger sign counseling						
Yes	121 (34.2)	76	45	4.87(3.04, 7.8)**		4.34 (1.61, 11.7)
No	233 (68.8)	60	173	1.00		1.00
PNC visit within 6 days						
Yes	145 (33.6)	74	71	3.29 (2.16, 5.02)**		3.32 (1.26, 8.67)
No	287 (66.4)	69	218	1.00		
Source of information						
Yes	253 (83.8)	127	126	2.29 (1.19, 4.4)*		6.04 (1.63, 22.4)**
No	49 (16.2)	15	34	1.00		1.00
Mode of delivery						
Spontaneous vaginal delivery (SVD)	248 (57.4)	51	197	1.00		1.00
Caesarian section	148 (34.2)	80	68	4.5 (2.9, 7)**		3.86(1.46, 10.25)
First source of information						
Family	52(19.9)	12	40			
Health professional	81(31)	47	34	4.6 (2.1, 10.6)**		5.45(1.27, 23.3)*
Media	68 (26.1)	35	33	3.5 (1.6, 7.9)*		5.08(1.16, 22.36)*

*=p-value <0.05, **=p-value<0.001, CI = Confidence Interval, COR = Crude Odds Ratio, AOR = Adjusted Odds Ratio

5. DISCUSSION

The knowledge of neonatal danger signs was found to be (32.9% with 95% CI: 28.9%, 37%). It was found satisfactory on educated mothers and those who got ANC counseling about neonatal danger sign at their current baby ANC follow up visit.

The knowledge of neonatal danger signs in this study was lower than the studies done in India by 2006, which showed 39% (Awashti *et al.*, 2008), in Nigeria by the year 2009 which was 78.3% (Ekochi *et al.*, 2015), in Egypt by 2008 which was 69% (Rasha *et al.*, 2010) and in Tigray region Ayder referral hospital (2011), 64% (Hadush *et al.*, 2013). Even though, the most frequently mentioned danger sign was fever, in all four studies, which is congruent with this study; **the knowledge gap may be due to socio economic differences lead to owning advanced health care delivery system.** But the latest might be due to nature of the study which was conducted on; immediate postnatal mothers are periodically near to the time of counseling. Meanwhile, the study in four regions of Ethiopia (i.e., Oromia, SNNP, Tigray and Amhara) in 2010 showed **lower than this study** (29.3%) knowledge outcome (Koru *et al.*, 2013). **This might be due to involvement of rural womens in the study.** However, another study conducted in Ghana by 2008 and Gondar by the year 2012, (Lem and Yadeta, 2014, Selomon *et al.*, 2015) knowledge was (28% vs. 18%) respectively, which is lower than the study area. The discrepancy in knowledge might be the study was conducted in rural area for the earliest one. But the latest one was due to nature of the study (i.e. community level), plus the researcher allowed mothers gave birth two years back to participate in the study. Thus, make mothers fail to recall and loose caring responsibility. Over all the poor level of knowledge on this study implied that neonates are at great risk of death with out health seeking ,though they are manifesting by danger signs.

In this study, mothers who learnt to secondary level and college and above were more likely to know about neonatal danger signs compared to those not took formal education. This was nearly consistent with the study conducted in Gondar, (2012) that mothers with the same level of education were more prone to know ≥ 3 neonatal danger sign with and without prior prompt (Selemon *et al.*, 2015). This might because education increases the tendency to get service and to read materials related to their baby.

Similarly, the study showed mothers own husband level of education from secondary to college and above were more likely to recognize neonatal danger signs, this is also consistent with study in Gondar

(2012), that husband education to this level gave their wives an opportunity to recognize danger signs comparing to those of not took formal education (Selemon *et al.*, 2012). This might be educated fathers foster their wife and newborns health care services.

The study revealed that mothers who get counseled about neonatal danger signs during their current ANC follow up and those who had PNC visit during the first six days postpartum were more likely to have good knowledge about neonatal danger signs. This was nearly consistent with the study in Finche town Oromia region in 2012 (Yeshiwork, 2015) and in Gondar, 2012 (Selemon *et al.*, 2015). This is due to the fact that increased maternal ANC and PNC utilization promotes the like hood of counseling and knowledge acquisition.

According to the study multipara mothers were more knowledgeable comparing to Primi para mothers. This is consistent with cross sectional study conducted in India at maternity centers of Madurai Corporation and Sir- Lanka (2009) (Senarath *et al.*, 2011) as well as to the study conducted in Egypt (2008), where poor knowledge was reported in Primi para mothers (Rasha *et al.*, 2010). This might be multi para mothers are concerned and experienced by previous live births.

This study tried to test new variables, among them mode of delivery was found to be significantly associated. Mothers who delivered through caesarian section were found more knowledgeable about neonatal danger signs compared to those who delivered by spontaneous vaginal delivery (SVD). This might be the longer they stay at health facility in the postnatal period, the more to get counseled about neonatal danger signs.

Mothers who had source of information about neonatal danger signs were 6 times more to know the dangers signs compared to those who didn't had. In addition to this, mothers who got information about neonatal danger signs from health professional and media for the first time were 5.5 and 5.08 times more knowledgeable compared to those who got from family.

Mean while, this study showed that mothers who had prior information were more likely to know neonatal danger signs. In line with that, mothers who got information from health professional and media were more knowledgeable about neonatal danger signs. This is congruent with the study conducted in India by 2012, where poor knowledge was due to other sources than health professional (Jiji *et al.*, 2014) and with the study conducted in Gondar (2012), by which mothers got their first information about neonatal danger sign from health professional and media were significantly effecting good knowledge (Selomon *et al.*, 2015). This similarity might be information got from

health professional is to the point and trusted plus; Transmission of health related program in media increases the like hood of acquiring information about neonatal danger signs.

This study showed mothers who knew the exact breast feeding initiation as <1 hour (78%) found to be high and more knowledgeable comparing to those who report as >1 hours. This is consistent with the study in Nepal Chitan district (2011) even though the number of mothers who reported as <1hr differs (78% vs. 52%) (Chawudhay *et al*, 2013). This consistency might be due to the emphasis given by the government up on counseling breast feeding habit of mothers, which increases bonding and identifying possible newborn illness.

Generally, the study tried to determine mother's knowledge and associated factors about neonatal danger signs. Thus it can be an input for other potential related researches with other pocket studies. The strength of the study was, it used WHO recognized clear cut point criteria to measure maternal knowledge of neonatal danger signs. Thus, helps to see our mother's awareness from international point of view. Concerned bodies to minimize possible gap of the research are locally available and easy to inform, plus good response rate were among the prominent strengths. The study might face some limitations; such as recall bias because it allowed mothers who immunize their baby up to four month, as neonatal danger signs are common in the first month of life. For that mothers who immunize their baby for BCG were given special emphasis. Additionally, the study might not show temporal relationship because the design was cross-sectional.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

Mother's knowledge about neonatal danger sign was poor. Only about one-third mothers achieved the criterion of WHO and lancet regarding good knowledge about neonatal danger signs. It was higher on mothers who used to have source of information, (i.e. those who got the information from health professional and media for the first time). Mothers who attend postnatal follow up and got ANC counseled about neonatal danger signs were least in number but still found owing good knowledge. The most frequently mentioned neonatal danger signs were umbilical cord bleeding, redness, pus and fever whereas, hypothermia and vomiting were the least mentioned one.

Maternal level of education, husband level of education, being multi para mothers, having PNC visit and giving birth through caesarian section were identified as positively significant associated factors with owing good knowledge of neonatal danger signs.

6.2. Recommendations

6.2.1. To Harar town health bureau and head of every health facilities

- ✓ They should work collaboratively to increase the awareness of mothers about neonatal danger signs through integrating of neonatal danger sign counseling as one of the main area to be covered during ANC and PNC visits, as only few mothers received this service were found bring good outcome.

6.2.2. To health extensions and mother-support- group

- ✓ They should work together up on supporting mothers to get extra maternal services. Because, the current focus area is only issues related to maternal health services, while maternal newborn care practice, awareness about potential neonatal illnesses are left un counseled at community level which leads to poor knowledge score in this study.

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APPENDIXIS

Appendix: A. Information Sheet and Voluntary Consent Form for Heads of Hospital and health center

My name is _____, I am working as data collector for the study being conducted in this Institution by Fissaha Tekulu who is studying Masters Degree at Haramaya University College of Health and Medical Sciences. I kindly request you to lend me attention to explain you about the study and being selected as the study participant.

Title of the study: Knowledge of neonatal danger signs and associated factors among mother's who gave birth the last four months attending immunization servieses in Harar town public Health Facilities, Ethiopia

Purpose: The findings of this study can be of a paramount important for your institution to know the status of mothers knowledge about neonatal danger signs and to point out major factors that hinder the awareness or knowledge gain, and take corrective actions toward the factors through health education and routine counseling and other measures to increase the mother's knowledge of neonatal danger signs so as, to promote early health care seeking behavior and reduce neonatal mortality throughly. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a Master's program in Maternity and Neonatal nursing for the principal investigator whose name is mentioned above.

Procedure: I will interview the mothers face to face before or after they immunize their babies to answer the questions, which are 48 in number with their possible choices, and may took around 20-25 minutes to collect the nessesary data for the principal investigator. Mothers who are poor in knowledge according to the researcher standard pointed from the questionnaire will be told what the key danger signs of a neonate are immidatly at the end of the interview.

Risk and benefits: By participating in this study the mothers may feel that it has some discomfort specially on wasting time (about 20-25 minutes), for that mothers will be persued this may not be too much risky comparing its potential benefits it contributes, and no that much risk will imposed on them by participating in this study.

Confidentiality and Anonymity: The information that I am going to collect from the mothers for this study will be kept confidential. Information collected during the study will be stored in a file, which

will not have individual name on it, but a code number assigned to it. Which number belongs to which name will be kept under lock and key, and it will not be revealed to anyone except the principal investigator.

Rights: permission to this study is on voluntary basis. You have the full right to permit or not for the study. You have also the full right to terminate this study at any time if you get something wrong with the study.

Persons to contact: If there are any questions about study, you can contact by any of the following addresses.

Fissaha Tekulu: Mobile number +251 914437846

E-mail: fissahatekulu7080@gmail.com

Institutional Health Research Ethics Review committee:

Tel: +251256661899

P.O.Box 235, Harar

Declaration of informed voluntary consent: I have heard/read the information sheet and voluntary consent form for hospital heads. I have clearly understood the purpose of research, procedures, the risks and benefits, issue of confidentiality, the right of participating and contact address for any queries. I have been given opportunity to ask questions for things that are unclear. I was informed my rights whether to continue or terminate the study. Therefore I declare my voluntary consent to permit this study to be conducted in _____ with my signature as indicated below.

Name and signature of head of hospital _____

Signature of data collector _____

Thank you for your cooperation!

Appendix: B. Consent form

I. Participant Information sheet and informed voluntary consent form

Greeting Good morning / afternoon

Hello my name is _____. I am a data collector for master of Maternity and neonatal nursing student project in Haramaya University.

The study title: Knowledge of neonatal danger signs and associated factors among mothers who gave birth the last 4 months attending immunization services in Harar town public health facilities, Eastern Ethiopia.

Purpose of the study: The findings of this study can be crucial enough for Harar Town Health Office and Harar public health institutions to plan intervention programs to improve mother's knowledge of neonatal danger signs so as to increase their health care seeking behavior. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a Master's program in Maternity and neonatal nursing for the principal investigator.

Procedure and duration: I will be interviewing you using questionnaire to provide me with pertinent data that is helpful for the study. There are 48 questions to answer where I will fill the questionnaire by interviewing you. The interview will take about 20-25 minutes, so I kindly request you to spare me this time for the interview.

The benefit of the study: there is no direct benefit of the participant of the study. However the results of this study will help in identifying the obstacles of good knowledge about neonatal danger signs and contributes on input in considering a convenient programmatic approach to solve the problem. The result of the study will be disseminated to concerned bodies, including to Harar town administrative Health office.

The risk of the study: The risk of being participated in this study is very minimal, but only taking few minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for Harar Town Health Office and Harar public health facilities in planning what measures to be taken to improve weak findings of the study.

Right of participants: you have full right either to participate or decline participation in this study as a participant. You may respond to all the questions or you may not answer to the questions you don't want and you may end the interview at any time you want. You can ask any questions which is not clear for you.

Confidentiality: any information forwarded will be kept confidential. The findings of the study will be general for the study population and will not reflect anything particular of individual person. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact me:

Fissaha Tekulu: Mobile number (+251)-914-437846)

Email Address: fissahatekulu7080@gmail.com

Institutional Health Research Ethics Review Committee: Phone Number (+251)-025-466-07-08, P.O.Box 235, Harar

Declaration of informed voluntary consent: I have read/was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues to confidentiality, the rights of participating and contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to stop the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature) as indicated below.

Name and signature of the participant: _____ Date _____

Name of data collector: _____ Signature _____ Date: _____

Appendix: C. English version questionnaire

Instruction: Code the response on the code column from the alternative and write the answer for open ended on the space provided.

Part I: Socio Demographic information

S.No_	Questions	Choice of response	Code	Skip
101	Is your baby less than 6 month age?	1. Yes 2. No		If No leave
102	How old were you at your last birth day?	_____ Age in complete year		
103	Can you read and write simple sentence in any language you speak?	1. Yes 2. No		105
104	What is the highest level of Education you attained?	1. No formal education 2. 1-8 th 3. 9 th -12 th 4. College and above		
105	What is your current marital status?	1. Single 2. Married 3. Divorce 4. Widowed 5. Other (specify)-----		106
106	What is the highest level of Education your husband attained?	1.No formal education 2. 1-8 th 3. 9 th -12 th 4.College and above		
107	What is your religion?	1.Orthodox 2.Muslim 3. Catholic 4.Protestant 5. Other (specify)-----		
108	To which ethnic group do you Belong?	1. Oromo 2. Amara 3.Harari 4. Guragie 5.Other(specify)-----		
109	What is your main occupation?	1.Governmental employee 2. Private employee		

		3.House wife 4.Farmer 5.Daily laborer 6.Merchant 7.Student 8.others (Specify)-----		
110	Residence?	1.Urban 2.Rural		

Part II: Knowledge on Neonatal danger signs questions.

201	Do you know about Neonatal danger sign?	1. Yes 2. No		204
202	How many neonatal danger signs do you know?	1. One 2. Two 3. Three and above		
203	Can you able to mention them?			<u>Code</u> \checkmark <u>if she list > 3 D.S</u>
Knowledge question with prompt				
204	Un able to feed (not feed well)	1.Yes 2. No		
205	lethargy(sever weakness)	1.Yes 2. No		
206	Fever	1.Yes 2. No		
207	Difficulty breathing	1.Yes 2. No		
208	Convulsion	1.Yes 2. No		
209	Cold to touch	1.Yes 2. No		
210	Fast breathing	1.Yes 2. No		
211	Jaundice (Yellow soles or palm)	1.Yes 2. No		
212	Unblical cord bleeding, redness or pus	1.Yes 2. No		
213	Vomiting	1.Yes 2. No		

Part III; Questions related to source of information about neonatal danger sign

301	Do you have source of information?	1. Yes _____ 2. No	→ 302
302	From which source do you get the information about neonatal danger signs for the first time?	1. Health professionals 2. Media _____ 3. Reading books 4. Family 5. Friend 6. Other (specify)-----	→ 303
303	What type of media do you use?	1. Television _____ 2. Radio _____ 3. Newspaper 4. Magazine 5. Other (specify)-----	→ 304 → 305
304	Television how many times?	1. Always 2. Health program only 3. Twice a week 4. Once a week 5. Other (specify)-----	
305	Radio how many times?	1. Always 2. Health program only 3. Twice a week 4. Once a week 5. Other (specify)_____	

Part IV. Obstetric and maternal health service information

401	How many births did you have?	_____	
402	Did you attend ANC during your recent pregnancy?	1. Yes 2. No _____	→ 407
403	How many times have you attended ANC in your recent pregnancy?	1. One 2. Two 3. Three 4. Four	
404	Whom did you see during Your recent ANC visit?	1. Physician 2. Health officer 3. Nurse/Mid wife	

		4.HEWS 5. Others(specify) _____		
405	Did you receive any counseling During your recent antenatal period?	1. Yes 2. No →		407
406	About what did you counseled?	Breast feeding	1.Yes 2.No	
		Maternal nutrition	1.Yes 2.No	
		Family planning	1.Yes 2.No	
		Hygiene	1.Yes 2.No	
		HIV awareness	1.Yes 2.No	
		Immunization	1.Yes 2.No	
		Newborn danger sign	1.Yes 2.No	
		Other(specify)_____		
407	Where did you deliver your recent Baby?	1. Hospital 2. Health center 3. Health post 4.private health institution 5.Home 6.Other(specify)_____		
408	Who assisted you during your Recent delivery?	1.Health professional 2.HEWs 3. TBA 4.TTBA 5.Relative (friend) 6. No one		
409	What was your mode of delivery	1. Spontaneous vaginal delivery 2. Instrumental assisted delivery 3. Caesarean section		
410	Were you seen by health workers Within 6 days of delivery?	1. Yes 2. No →		501
411	By whom did you seen?	1.Physician 2.Health officer 3.Nurse/mid wife		

		4.HEWS 5. Others(specify)_____		
412	Did you receive any counseling within 6 days delivery about Neonatal danger signs?	1. Yes 2. No		

Appendix D: Amharic Version of the Participant Information Sheet and Voluntary Consent Form

አባሪ: ስምምነት ቅጽ

እንደምንደረሩ / እንደምንዋሉ

ስሜ.....እባላለሁ። አሁን እየሰራሁኝ ያለሁት በዚህ ማህበረሰብ ለሚደረገው ጥናት መረጃ ሰብሳቢ ሆኜ ለአቶ ፍሳሃ ተኩሉ በሐረማያ ዩኒቨርሲቲ ስነ-ተዋልዶና ህጻናት ህክምና በማስተርስ ደረጃ ለመመረቅ የሚሆን ጥናት ለማካሄድ ነው። ስለዚህ እንዴት ተሳታፊ መሆን እንደቻለሁና ስለጥናቱ በተመለከተ ማብራሪያ እንድሰጥዎት የተወሰነ ጊዜ እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

የጥናቱ ርዕስ : በሀረር የ ህዝብ ጤና ተቋማት እድሜያቸው ከወሊድ እስከ 4 ወር ህጻናት ያላቸው ለክትባት የመጡ እናቶች ስለአደገኛ የህጻናት ህመም ምልክቶች ያላቸው እውቀትና ተዛማጅ ምክንያቶች።

የጥናቱ ዓላማ:

የዚህ ጥናት ግኝት ለሐረር ከተማ ጤና ፅ/ቤትና ለሐረር የመንግስት ጤና ተቋማት ተጨማሪ ለእናቶች ስለአደገኛ የህጻናት ምልክቶች ግንዛቤ ለማሻሻል ለሚያደርጉት ጥረት ከፍተኛ ጠቀሜታ ይኖረዋል። የዚህ ምርምር ደካማ ግኝቶች እርምጃዎች እንዲወሰዱ እቅድ ለማወጣት ይጠቅማል። ከዚህ በተጨማሪም ለዋና አጥኚው የማስተርስ ትምህርቱን ለማጠናቀቅና የመመረቅ ፅሁፍ ለማዘጋጀት ይጠቅመዋል።

የጥናቱ ሂደትና ጊዜ: ለጥናቱ የሚያገለግሉና መረጃ ሊሰጡ የሚችሉ ጥያቄዎች ተዘጋጅተዋል እነዚህ ጥያቄዎች ጠቅላላ 48 ሲሆኑ በቃለምልልስ ጥያቄዎቹን ለመመለስ በግምትከ 20-25 ደቂቃ ይፈጃል። ስለዚህ አሁ ም በድጋሚ ጊዜዎት እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

ጉዳትና ጥቅም: በዚህ ጥናት በመሳተፍዎ ከሚወስደው ጊዜ በስተቀር የሚደርስበት ጉዳት በጣም አነስተኛነው። በዚህ ጥናት በመሳተፍዎ የሚያገኙት ቀጥተኛ ጥቅም የለም ነገርግን ከጥናቱ የተገኙት ጠቃሚ መረጃዎች ስለጤና እና ጤናን በተመለከተ ለሚያቅዱ የሚመለከታቸው ባለድርሻ አካላት ይጠቅማቸዋል። እንደዚህ እርሶም በተዘዋዋሪ የጥናቱ ተጠቃሚ ይሆናሉ።

ምስጢር አጠባበቅ: የሚሰጡን መረጃ ሁሉ ምስጢርነቱ የተጠበቀነው። ለዚሁም አርሶዎን የሚገልጽ ምንም ነገር የለም። ለምሳሌ የእርሶ ስም መጠይቁ ላይ አይጻፍም። የጥናቱ ውጤት ለግለሰብ ወይም ደግሞ ለቤቴሳብ ሳይሆን አጠቃላይ ነው።

የተሳታፊው መብት: በዚህ ጥናት ለመሳተፍ ሙሉ-ፈቃደኝነት ያስፈልጋል። በዚህ ጥናት የመሳተፍ ወይም ያለመሳተፍ ሙሉ መብት አለዎት። ላለመሳተፍ ከፈለጉ ደግሞ በማንኛውም ጊዜ በመሀል ራስዎን ከጥናቱ ማግለል(ማቋረጥ) ይችላሉ። ካቋረጥኩኝ ጥቅም ይጎልብኛል ብለው አያስቡ። መመለስ የማይፈልጉትን ማንኛውም ጥያቄ አለመመለስ መብቶቸው።

አድራሻ: ስለጥናቱ አካሄድ ወይም ስለጥናቱ መጠይቅ ወይም ደግሞ ጥናቱን በተመለከተ ማንኛውም ጥያቄ ካሎት የሚከተሉትን አድራሻ ይጠቀሙ፡፡

ፍሰሃ ተክሉ፡ ሞባይል-(+251)-914-437846፣ኢ.ሜይል-fissahatekulu7080@gmail.com

ተቋማዊ የጤና ምርምር ስነ-ምግባር ግምገማ ኮሚቴ፡ ስልክ-(+251)-025-466-07-08፣ፖ.ሳ.ቁ-235 ሀረር

በፈቃደኝነት ላይ የተመሰረተ የስምምነት ማረጋገጫ፡ የተሳታፊውን መረጃ ፎርም አንብቤዋለሁ ወይም ተነበልኛል፡፡የጥናቱ ዓላማ፣ ያለውን ጉዳትና ጥቅም ፣ ምስጢር አጠባበቅ የመሳተፍ እና ያለመሳተፍ መብት እንዲሁም ችግር ካለ ከማንጋር መገኛኝነት እንዳለብኝ ሁሉ ተገልጿል፡፡ጥያቄ ካለኝ ደግሞ እንደ ጠይቅ እድል ተሰጥቶኝ በመሆኑ ደግሞ ጥናቱን ለማቆም ከፈለኩኝ በማንኛውም ጊዜ ከጥናቱ /ከተሳታፊነት/ መውጣት እንደምችል በመጨረሻም መመለስ የማልፈልገውን ጥያቄ አለመመለስ መብቱ እንዳለኝ ከተረዳሁኝ በኋላ በሙሉ ፈቃደኝነት በዚህ ጥናት ለመሳተፍ የወሰንኩኝ መሆኔን ከዚህ በታች በተቀመጠው ፊርማዬ አረጋግጣለሁ፡፡

የተሳታፊ ፊርማ..... ቀን.....
የመረጃ ሰብሳቢ ስምፊርማ..... ቀን.....

Appendix E: Amharic Version of the Questionnaire

ተ.ቁ	ጥያቄ	የ መልስምርጫዎች	ምልክት	ዝላል
101	ህፃንሽ እድሜው ከ 6 ወር በታችነው?	1. አዎ		አዎ ቀጥል አይደለም ተው
		2. አይደለም		
102	የመጨረሻ ልደትሽ ስታኩብሪ እድሜሽ ስንት ነበር?	----- ሙሉ አመታት		
103	በማንኛው ቋንቋ ማንበብ ና መጻፍ ትችያሽ?	1. አዎ		105
		2. አልችልም _____		
104	የትምህርት ደረጃዎ?	1. መደበኛ ትምርት አልወሰዱም 2. 1ኛ-8ኛ ክፍል 3. 9ኛ-12ኛ ክፍል 4. ኮሌጅና ከዛ በላይ		
105	የትዳርዎሁኔታ?	1. ያላገቡ 2. ያገቡ 3. የፈቱ 4. የሞተባቸው 5. ሌላካለ (ይተቀስ)		106
106	የባልዎትምርትደረጃ?	1. መደበኛ ትምርት አልወሰዱም 2. 1ኛ-8ኛ ክፍል 3. 9ኛ-12ኛ ክፍል 4. ኮሌጅ ና ከዛ በላይ		
107	ሀይማኖትዎ ?	1. ሙስሊም 2. ኦርቶዶክስ 3. ካቶሊክ 4. ፕሮቴስታንት 5. ሌላካለ (ይጠቀስ)		
108	የ ምን ብሄር ተወላጅ ነዎት?	1. አሮሞ 2. አማራ 3. ሀረሪ 4. ጉራጌ 5. ሌላካለ (ይጠቀስ).....		
109	ስራዎት ምንድነው?	1. የመንግስት ሰራተኛ 2. የ ግል ሰራ 3. የ ቤት አመቤት 4. ገበሬ 5. የቀንሰራተኛ 6. ነጋዴ		

		7. ተማሪ 8. ሌላካለ (ይጠቀስ).....		
110	የምትነራው የት ነው?	1. ከተማ 2. ገጠር		

ክፍል ሁለት፡ የህፃናት አደገኛ የህመም ምልክቶች ግንዛቤ በሚመለከት

201	ስለ አደገኛ የህፃናት ህመም ምልክቶች ግንዛቤ አለሽ ?	1. አዎ 2. የለኝም		204 ይሂዱ
202	ስንት አደገኛ የህፃናት ህመም ምልክቶች ያወቃሉ?	1. አንድ 2. ሁለት 3. ሶስት ና ከዛ በላይ		
203	ሊጠቅስዎቸዉ ይችላሉ?			ከ 3 በላይ ጠቀሱ ህ ያስቀምጡ
ስትጠቅስላቸው የሚመልሱት የ እውቀት ጥያቄዎች				
204	አልጠባም ሲል(በደንብ ካልጠባ)	1. አዎ 2. አይደለም		
205	የድካም ስሜት ሲሰማዉ	1. አዎ 2. አይደለም		
206	ትኩሳት	1. አዎ 2. አይደለም		
207	መስተንፈስ ሲያቅተው	1. አዎ 2. አይደለም		
208	ወፈፍ ስያርገዉ	1. አዎ 2. አይደለም		
209	ግንባሩ ስናስሰዉ ሲቀዘቅዘ	1. አዎ 2. አይደለም		
210	ተሎተሎ ማስተንፈስ	1. አዎ 2. አይደለም		
211	አይኑ፤የእግሩና እጁ መዳፍ ቢጫ ሲሆን	1. አዎ 2. አይደለም		
212	እትብቱ ሲቀላ፤ ሲደማ ና መግል ስይዝ	1. አዎ 2. አይደለም		
213	ስያስመልሰዉ	1. አዎ 2. አይደለም		

ክፍል ሦስት፡ ስለ የህፃናት አደገኛ የህመም ምልክቶች የ መረጃ ምንጭ በሚመለከት

301	የመረጃ ምንጮችን ይጠቀማሉ?	1. አዎ _____ 2. አልጠቀምም	→ 302
302	ስለ የህፃናት አደገኛ የህመም ምልክቶች መረጃ መጀመርያ ከየት ነው ያገኙት?	1. ከጤና ባለሙያ 2. መገናኛ ብዙሃን 3. መፅሀፍ በማንበብ 4. ከቤተሰብ 5. አቻ/ጉዋደኛ 6. ሌላካለ (ይጠቀስ).....	→ 303
303	ምን አይነት መገናኛ ብዙሃን ይጠቀማሉ?	1. ተሌቮኸን _____ 2. ፊደዮ _____ 3. ጋዜጣ 4. መጻሕፍት 5. ሌላካለ (ይጠቀስ).....	→ 304 → 305
304	ተሌቮኸን ስንት ጊዜ?	1. ሁሉ ጊዜ 2. የጤና ክፍለ ጊዜ ብቻ 3. በሳምንት ሁለት ጊዜ 4. በሳምንት አንድ ጊዜ 5. ሌላካለ (ይጠቀስ).....	
305	ፊደዮ ስንት ጊዜ?	1. ሁሉ ጊዜ 2. የጤና ክፍለ ጊዜ 3. በሳምንት ሁለት ጊዜ 4. በሳምንት አንድ ጊዜ 5. ሌላካለ (ይጠቀስ).....	

ክፍል አራት፡ ስለ ወሊድና ጤና አገልግሎት በተመለከተ

401	በ ሂዎት ስንት ሊጀኙ አሎዎት?	_____	
402	በመጨረሻ እርግዝናዎ የቅድመ ወሊድ ክትትል ያርጉ ነበር?	1. አዎ 2. አላረኩም _____	→ 407
403	ስንት ጊዜ?	1. አንድ 2. ሁለት 3. ሶስት 4. አራት	
404	ክትትል ሲያርጉ በማን ነው የታዩ?	1. በ ሃኪም 2. ጤና መኮኒን 3. ነርስ/ሚድሞይፍ 4. ጤና ኤክስተንሽን/ሰራተኛ 5. ሌላካለ (ይጠቀስ).....	
405	የጤና ምክር አገልግሎት አግኝተሽ ነበር?	1. አዎ 2. አላገኘሁም _____	→ 407
		ስለ ጡት ማጥባት	1. አዎ 2. አላገኘሁም

406	ስለ ምን?	ስለ አመጋግብ	1. አዎ 2. አላገኝሁም	
		የቤተሰብ ምጣኔ	1. አዎ 2. አላገኝሁም	
		ስለ ንፅህና	1. አዎ 2. አላገኝሁም	
		ስለ ኤችአይቪ	1. አዎ 2. አላገኝሁም	
		ስለ ክትባት	1. አዎ 2. አላገኝሁም	
		ስለ የህፃናት አደገኛ የህመም ምልክቶች	1. አዎ 2. አላገኝሁም	
		ሌላካለ (ይጠቀስ)----- -----		
407	የአሁኑ ህጻንሽ የት ነው የወለድሽው?	1. ሆስፒታል 2. ጤና ጣብያ 3. ጤና ኬላ 4. የግልጤና ተቋም 5. ቤት 6. ሌላካለ (ይጠቀስ).....		
408	ማን ነው ያዋለደሽ?	1. ጤና ባለሞያ 2. ያል ሰለጠነ/ች የባህል አዋላጅ 3. የ ሰለጠነ/ች የባህል አዋላጅ 4. ቤተሰብ(ጓደኛ) 5. በቻየን		
409	በምን ነበር የወለድሽው?	1. ያለ ምንምድጋፍ በማህፀኔ 2. በመሳርያ ድጋፍ በማህፀኔ 3. በቀድሞ ጥገና		
410	ከወለድ ቦሃላ በስድስት (6) ቀን ውስጥ በጤና ባለሞያታይተሽ ነበር?	1. አዎ 2. አልታየሁም →		501
411	ማን ነበር ያየሽ?	1. ሃኪም 2. ጤና መኮነን 3. ነርስ/ ሚድዋይፍ 4. ይጤና ኤክስተንሽንሰራተኛ 5. ሌላ ካለ (ይጠቀስ).....		
412	ስለአደገኛ የ ህፃናት ህመም ምልክቶች ምክር ተሰጥቶሽ ነበር?	1. አዎ 2. አልተሰጠኝም		

ክፍል አምስት፡ ስለ እናት የጨቅላህፃን እንክብካቤ አተገባበር

501	ስለ የህፃን እትብት እንክብካቤ ግንዛቤአለሽ?	1. አዎ 2. የለኝም	→	504
502	እትብትን ለመቋጠር ምን ትጠቀምያለሽ?	1. ንፅህና የጠበቀ ማሰርያ 2. ንፅህናው ያልጠበቁ ማሰርያዎች 3. አላዉቅም 4. ሌላ ካለ (ይጠቀስ).....		
503	ከ ወሊድ በኋላ እትብቱ ላይ ምንድነው ምታስቀምጪ?	1. ምንም 2. ፀረ ተባይ 3. ቅቤ 4. ሌላ ካለ (ይጠቀስ).....		
504	ማጥባት መቼ ጀመርሽ?	1. በ አንድ ሰዓት ውስጥ 2. ከ አንድ ሰዓት በኋላ		
505	ህፃንሽን ያለ ተጨማሪ ምግብ ለ ስድስት ወር አጥብተሽዋል?	1. አዎ 2. አላጠብኩትም		
506	ህፃኑ መታጠብ መጀመር ያለበት ትክክለኛ ጊዜ መች ነው?	1. በ 24 ሰዓት ውስጥ 2. ከ 24 ሰዓት በኋላ		
507	ህጻንሽ ሲወለድ ወድያውኑ አስከትብሽዋል?	1.አዎ 2. አላስከተብኩትም		
508	ህፃንሽ በሚተኛበት አልጋ የ ቢንቢ መከላከያ አለው?	1. አዎ 2. የለውም		

በጣም አርጌ አመሰግናለሁኝ!!

Appendix F: Afaan Oromoo version of the Participant Information Sheet and Voluntary Consent Form

IV. Unkaa waligalte kan hirmaatootan mirkanaa'u

Akkam Bultan? /Akkam Oltan?

Nagaan Waqqaayoo issinif haata'u! Akkam jirtu, Anni Maqaan koo _____ jeedhamaa, kanaan dhufe Hawaasaa kan keessati waa'ee hadhollii fi daa'immanii irratti Univarsiitii Haroomayaati qo'annoo barnoota digirii lamaffaaf bakka kanatti gaggeessaniif ragaa sasabadha. Kanaafuu Qo'annoo kana irraatti ibsa gabaabaa akka isiif kennuu kabajaan isiin gaafadha.

Mata duree qo'annoo: Hubannoo hadhollin daa'immanni isaanii dhalatanii hanga ji'a jahaa gahanitti mallattoo dhibee cimaa daa'immanii, rakkoo KKF irratti qaban fi dhimmoota sababa ta'uu danda'aan Magaalaa Harar keessatti qorachuuf ta'a.

Kaayyoo Qo'annoo: Qo'annoo Kun Waajjira Eeggumsa Fayyaa Magaalaa Hararii fi dhaabbilee fayyaan waa'ee mallattoo rakkoo cimaa daa'immanni fi sababa isaa irraatti hubannoo dabalataa akka argataniif faayyida gudda ni-qaba. Rakkoo qo'annoo kanan addan bahaan irratti karoorsoon tarkaanfii barbaachisaa fudhachuuf ni-gargaara. Dabalataanis barataan qorannoo kana geggeessuu akka itti eebbiffamuuf ni-gargaara.

Adeemsa qo'annoo fi yeroo: Qo'annoon Kun odeeffannoo gaafachuuf tilmaamaan daqiiqaa 20 hanga 25ni ni-fudhata. Kanaafuu qo'annoo kana irratti yaada fi yeroo akka naaf keennitan kabajaan issin gaafadha.

Bu'aa fi rakkoo qo'annoo: Qo'annoo kana irratti hirmaachuun sa'aatti dhimma kanaaf ole al midha hinqabu. Haata'u malee bu'aan qorannoo kana irra argamuu fayyaa hawaasaa keenyaaf murteessadha. Isiniis waan miseensa hawaasa kanaa waan tataniif gama biraatiin qorannoo kana irra fayyadamadha jechuudha.

Iciitti Eeguu: Ragaan kamiyyu Iciittin issa kan eegammedha. Jeechuunis eeyyama keessan malee qaama biraatiif hin keenamu. Qo'annoon Kun Univarsiitii Haroomayaatiin fudhatama argatera.

Mirgaa Hirmaatoota: Ragaa nuuf kennuu, dhoowwachuu ykn jidduutti addaan kutuun mirgaa keessan.

Yaada: Waa'ee qo'annoo kana irratti yaada fi gaaffii yoo qabataan bilbila armaan gadi irratti gaafachuu ni-dandessu.

Ob.FisahaaTakluu, Bilbila: (+251)-914-437846 Emalii: fissahatekulu7080@gmail.Com

Dhaabbilee Qo'annoo Fayyaa fi Gamaggama:_Bilbila: (+251)-025-466-07-08. Lakk. Poostaa 235 Harar.

Waliigaltee fedhii irratti hunda'ee kan ittin mirkana'u: Ragaa qophaa'e kan dubbiseera/naaf dubbiffameera. Kaayyoo qo'annoo, bu'aa fi midhaan isaa, haala iciitti itti fayyadamu naaf ibsameera. Gaaffii yoo qabadhe mirga gaafachuun naaf kennameera. Akkassumas mirga addaan kutuus akka qabu ergan hubadhe booda maqaa daa'immakootiin qorannoo kana irraatti fedhii guutuuttiin hirmaachuu koo mallattoo arman gadi irratti ni- mirkaneessa.

Maqaa Hirmaata _____ Mallattoo _____ Guyyaa _____

Maqaa Gaafata _____ Mallattoo _____ Guyyaa _____

Appendix G: Questionnaire of Afaan Oromoo version

Instruction: Code the response on the code column from the alternative and write the answer for open ended on the space provided.

Kutaa I: Gaaffii waa'ee jireenya hawwassuma isaa ibsu.

Lakk	Gaaffilee deebistootaaf dhiyaate	Deebii deebi'e	Koodii	Qorannoo/Hubachisa
101	Umuriin daa'imma keetti ji'a jahaa gadi?	1. Eeyyee 2. Lakkii		1. Yoo Eeyee jedhe gaaffii armaan gadi itti fufii. 2. Yoo Lakkii jedhe galaateefadhutti bira darbii.
102	Guyyaa dhaloota kee issa dhuma yeroo kabajuu Umuriin kee meeqa ture?	_____ Umurii waggaa guutuun		
103	Afaan kaminiyuu dubbisuu fi barreessuu ni-dandeessa?	1.Eeyyee 2. Lakkii		105
104	Sadaarkaan Barumisaa keessan ini gudda ammam?	1..Homa hin barane 2. Barnoota Sadarkaa duraa (1-8) 3. Barnoota sadarkaa lammaaffaa (9 -12) 4. Kolleejjii fi isaa ol		
105	Bultiin keessan maal fakkata?	1 .Takkaayu hin heerumne 2.Heerumeen dhirsa qaba _____ 3. Abbaa warraa koo waliin wal-hikineera 4. Dhirsii koo nabirra hin jiru 5. Kan bira ibsaa -----		106
106	Sadaarkaan Barnoonni abbaa warraa kee baratee inni olaanaa ammam?	1.Homa hin barane 2. Barnoota Sadarkaa duraa (1-8) 3. Barnoota sadarkaa lammaaffaa (9 -12) 4. Kolleejjii fi isaa ol		
107	Amanitiin Keessan kami?	1. Muslimaa 2. Ortodoksii 3. Kaatolkii 4. Protestaantii 5. Kan bira ibsaa -----		
108	Sabni keessan maalii?	1. Oromoo 2. Amaarraa 3. Hararii		

		4. Guraagee 5. Kan bira ibsaa -----		
109	Hojiin keessan maali?	1.Hojjeetuu mootummaa 2. Hojjeetuu dhunfaa 3. Hadha warraa 4. Qote bultu 5. Hojjeetuu guyyaa 6. Daldaltuu 7. Barattuu 8. Kan bira ibsaa-----		
110	Essa jiraata?	1. Magaalaa 2. Baadiyaa		

Kutaa II: Gaaffii hubannoo mallattoo dhibee cimaa daa'immanni

201	Waa'ee Mallattoo dhibee cimaa daa'imani ilaalichisee odeeffannoo qabda?	1. Eeyyee 2. Lakkii	→	204
202	Mallattoo dhibee cimaa daa'immanni meeqa beekta?	1. Tokkoo 2. Lama 3. Saddii fi issa ol _____		
203	Mallattoowaan dhibee cimaa ibsuu ni- dandeessu?			IsiYoo saddii ol ibsitee mallattoo “√” bakka duwwa kenamee irratti agarsi

Gaffille hoggaa garsisan/hoggaa himannif dabisuu dandan

204	Harma hodhuu dadhabuu	1. Eeyyee 2. Lakkii		
205	Dadhabina ykn humna dhabuu	1. Eeyyee 2. Lakkii		
206	Ho'inii qaama dabaluu	1. Eeyyee 2. Lakkii		
207	Hafuura bafachuu dadhabuu	1. Eeyyee 2. Lakkii		
209	Qaamni yoo tuqan kan qabana,uu ta'u	1. Eeyyee 2. Lakkii		

210	Hafuura dafee dafee baafachuu	1. Eeyyee 2. Lakkii		
211	Faanni lukaa keeloo fakkachuu	1. Eeyyee 2. Lakkii		
212	Handhurii daa'imma dimachuu fi mala'uu	1. Eeyyee 2. Lakkii		

Kutaa III; Waa'ee mallattoo dhibee cimaa daa'immanni madda odeeffannoo

301	Madda Odeeffannootti ni-fayyadamtu?	1. Eeyyee 2. Lakkii		→ 302
302	Waa'ee mallattoo dhukkubba cimaa daa'immanni eesaa dhageessani?	1. Oggeessa Fayyaa irra 2. Raadiyoo/TV irra 3. Maatii irra 4. Hiriyyaa irra 5. Kan bira ibsaa-----		→ 303
303	Gosa madda odeeffannoo malii fayyadamtu?	1. Televishinii 2. Raadiyoo 3. Gaazeexxaa 4. Masehetii 5. Kan bira ibsaa-----		→ 304 → 305
304	Televishinii yeoo kam ilaaltuu?	1. Yeroo hunda 2. Yeroo sagantaa fayyaa qofa 3. Torbanti sa'a lama 4. Torbanti sa'a tokkoo 5. Kan bira ibsaa-----		
305	Raadiyoo yeroo kam dhageeffatu?	1. Yeroo hunda 2. Yeroo sagantaa fayyaa qofa 3. Torbanti sa'a lama 4. Torbanti sa'a tokkoo 5. Kan bira ibsaa-----		

Kutaa IV. Da'umsa fi Tajaajila fayyaa hadha kan ilaalu ta'a.

Lakk	Gaaffilee deebistootaaf dhiyaate	Deebii deebi'e	Koodii	Qorannoo
401	Kan ammaa deesse kunii yeroo meeqaaffadhaaf?	_____		
402	Hordoffii ulffa kan da'uumsan dura kanan dura fayyadamtaa?	1. Eeyyee 2. Lakkii		→ 407
403	Uulfa isaa dhumma irratti hordoffii tajaajila kuununsa dahuumsa duraa yeroo meeqaaf godhatee ykn tasiftee?	1. Tokko 2. Lamma 3. Saddii 4. Afuur		

404	Hordoffii tajaajila kuununsa dahuumsa duraa yeroo taasifan eenyuun ilaalmtan?	1. Haakimaan 2. Qondaala Fayyaan 3. Narsiin/oggeessa deesistuun 4. Ekisteenshinee Fayyyaatiin 5. Kan bira ibsaa _____		
405	Uulfa isaa dhumma kana irratti gorsa tajaajila kuununsa dahuumsa duraa irratti argatanitu?	1. Eeyyee 2. Lakkii _____		→ 407
406	Gorsa mal-irratti argatan?	Harma hoosisuu irratti	1. Eeyyee 2. Lakkii	
		Sirna nyaataa haadhollii irratti	1. Eeyyee 2. Lakkii	
		Karoora maatii irratti	1. Eeyyee 2. Lakkii	
		Qulqullina irratti	1. Eeyyee 2. Lakkii	
		Hubannoo HIV irratti	1. Eeyyee 2. Lakkii	
		Tallaallii irratti	1. Eeyyee 2. Lakkii	
		Waa'ee mallaattoo dhukkubba cimaa daa'immani irratti	1. Eeyyee 2. Lakkii	
		8. Kan bira ibsaa _____		
407	Yeroo dhiheenya kanatti dhaabbata fayyaa kamitti deessanii?	1. Hospitalaa 2. Buufata Fayyaa 3. Keellaa Fayyaa 4. Dhaabbilee dhunfaatti 5. Manatti 6. Kan bira ibsaa _____		
408	Yeroo sana eenyuutu isin gargaree?	1. Ooggeessa Fayyaa 2. Deesistuu addaa (TBA) 3. Deesistuu addaa leenjii fudhate (TTBA) 4. Firaa fi Hiriyyaa 5. Homtuu nahingargaree		
409	Haala kamaan deesaan tutaan?	1. Rakkoo tokko malee 2. Meeshaan gargaarameen 3. Opreshiiniin		
410	Dahuumsa booda oggeessa Fayyaatiin guyyaa jahaa keessatti ilaalamteeta?	1. Eeyyee 2. Lakkii _____		→ 501

411	Eenyuun ilaalamtan?	1. Haakimaan 2. Qondaala Fayyaan 3. Narsiin/oggeessa deesistuun 4. Ekisteenshinee Fayyyaatiin 5. Kan bira ibsaa _____		
412	Erga deessee booda guyyaa jahaa keessatti gorsa waa'ee mallattoo dhukkubba cimaa daa'immani irratti argatanni jirtu?	1. Eeyyee 2. Lakkii		

Kuuta V: kunuunsa haati da'iima reefu dalateef tasiftu.

Gargarsa keessaniif baayyeen isin galateefadha!

Lakk	Gaaffilee deebistootaaf dhiyaate	Deebii deebi'e	Koodii	Qoran noo
501	Akka kununsi handhuuraa daa'imma dalateef tasifamu beektaa?	1. Eeyyee 2. Lakkii	→	504
502	Handhuura daa'imma handhuuruuf meeshaleen fayyadamtuu maaliifadha ?	1. Meeshalee qulquluu handhuuru fayyadan 2. Meeshalee qulquloo hin taane 3. Waan fayyadamu hin beekuu 4. Kan biraa(ibsaa)-----		
503	Handhuura daa'imma reefu dalatee irraa waan keesu ykn dibamu jiraa?	1. Ommaa hin dibuu 2. Keemikala akka alkoolii 3. Dhadhaa 4. Kan biraa(ibsaa)-----		
504	Daa'imma deesseef harma hoosisuu sa'aa meeqa keessati egaltaa?	1. Sa'aa tokkoo keessati 2. Sa'aa tokkoon booda.		
505	Hanqa amaa mucaa/ilimo kanke harmuma kaa qofaa luyisisaa turtee?	1. Eeyyee 2. Lakkii		
506	Daa'imma deessee sa'aa meeqati qaama dhiquuf egaltaa?	1. Sa'aa 24 keessati 2. Sa'aa 24 booda.		
507	Akumaa dhalteti hogasuma mucaa/ilimo kitanna gosistee?	1. Eeyyee 2. Lakkii		
508	Mucaa/ilimo katif siiree irratt zanziiarra nigotaffi	1. Eeyyee 2. Lakkii		