

**HARAMAYA UNIVERSITY**  
**COLLEGE OF HEALTH AND MEDICAL SCIENCES**  
**SCHOOL OF GRADUATE STUDIES**

**Low Birth Weight and Associated Factors among Newborns  
Delivered in Public Hospitals of North Shewa Zone, Oromia  
Regional State, Central Ethiopia**

**MSC THESIS**

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**Harar, Ethiopia**

**Low Birth Weight and Associated Factors among Newborns  
Delivered in the Public Hospitals of the North Shewa Zone, Oromia  
Regional State, Central Ethiopia**

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Science in Maternity and Neonatal Nursing**

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**December 2021**

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# APPROVAL SHEET

## HARAMAYA UNIVERSITY

### POST GRADUATE PROGRAM DIRECTORATE

I hereby certify that I have read and evaluated this thesis entitled ‘Low Birth Weight and Associated Factors among Newborns Delivered in the Public Hospitals of North Shoa Zone, Oromia Regional State, Central Ethiopia’ prepared under my guidance by Elias Yadeta. I recommend that it will be submitted as fulfilling the thesis requirement.

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As a member of the Board of Examiners of the M. Sc Thesis Open Defense Examination, I certify that I have read and evaluated the thesis prepared by Elias Yadeta and examined the candidate. I recommend that the thesis be accepted as fulfilling the thesis requirements for the degree of Masters in Maternity and Neonatal Nursing.

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Final approval and acceptance of the Thesis is contingent upon the submission of its final copy to the Council of Graduate Studies (CGS) through the Candidate’s Department or School Graduate Committee (DGC or SGC).



## **BIOGRAPHICAL SKETCH**

I was born in October 5, 1995, in the North Shewa zone, Kuyu woreda. I attended my primary education at Lafto Gulenta primary school and secondary and preparatory education at Gebre Guracha secondary and preparatory school. I graduated with a B.Sc. degree from Haramaya University in midwifery in 2018. I have been employed and serving as a Graduate Assistant and Assistant Lecturer at Haramaya University until I joined the school of postgraduate studies in Maternity and neonatal nursing in October 2020.

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

AOR	Adjusted Odds Ratio
APH	Antepartum Hemorrhage
CI	Confidence Interval
CSA	Central Statistics Agency
EDHS	Ethiopia Demography and Health Survey
FDRE	Federal Democratic Republic of Ethiopia
HFIAS	Household Food Insecurity Access Scale
IPVP	Intimate Partner Violence during Pregnancy
IUFD	Intra-uterine Fetal Death
LBW	Low Birth Weight
MUAC	Mid-Upper Arm Circumference
NBW	Normal Birth Weight
NMR	Neonatal Mortality Rate
SDG	Sustainable Development Goal
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

## ABSTRACT

**Introduction:** Despite numerous efforts to improve the quality of maternal and child health medical services, over twenty million babies are born with low birth weights each year globally. Low birth weight is one of the poor outcomes of health care and continues to be the leading cause of neonatal mortality in Ethiopia. However, factors related to low birth weight like physically demanding work during pregnancy, food insecurity have not been explored in Ethiopia. Thus, the purpose of this study was to assess factors that were not well studied in previous studies.

**Objective:** To assess the magnitude of low birth weight and associated factors among neonates born in public Hospitals of the North Shewa, Oromia Regional State, Central Ethiopia, from June 15-July 30.

**Methods:** Hospital-based cross-sectional study design was employed among 441 mothers and newborns pairs selected by systematic random sampling. Data were collected using a pretested and structured interviewer-administered questionnaire with chart reviewing. The data were coded, cleaned, and entered into Epi Data version 3.1 and exported to Statistical Package for the Social Sciences version 26 for analysis. Bivariable and multivariable logistic regression analyses were conducted to identify the association between explanatory variables and low birth weight. The adjusted odds ratio and 95% confidence interval were used to report the finding. A p-value less than 0.05 was used to declare the statistical significance.

**Result:** The magnitude of low-birth-weight was 17.7% (95% CI:14.3, 21.5). Pregnancy-related complication (AOR=2.12; 95% CI: 1.10,4.10), grand-multiparity (AOR=2.63; 95% CI:1.15,6.00), physical demanding work during pregnancy (AOR=2.20; 95% CI: 1.11,4.34), mid-upper arm circumference less than 23 centimeters (AOR=2.58; 95% CI: 1.29,5.18), partner violence during pregnancy (AOR=3.82; 95% CI 1.83,7.98), and being member of household with food insecure (AOR=2.22; 95% CI: 1.08,4.55) were factors significantly associated with low birth weight.

**Conclusion:** This study showed that the magnitude of low birth weight was relatively high. Pregnancy complications, grand multiparity, physically demanding work during pregnancy, partner violence, mid-upper arm circumference less than 23 centimetres, and food insecurity were factors associated with low birth weight. Strengthening the capacity of health care providers working especially in antenatal care on how to screening pregnant women for intimate partner violence, hard physical work, undernutrition and providing appropriate treatment might be helpful.

**Keywords:** Low birth weight, physically demanding work during, food insecurity, Ethiopia.

# 1. INTRODUCTION

## 1.1. Background

Low birth weight (LBW) is defined as “the weight at birth less than 2500 g (5.5lb) regardless of gestational age” According to World Health Organization (WHO, 2014). It is a key predictor of past and current public health problems like long-term maternal malnutrition, chronic maternal illness, and poor antenatal care (CSA, 2016). Newborn birth weight is influenced basically by the mother’s fetal development and her supplement of diet from birth to pregnancy (Hill, 2021). Over 70% of LBW babies are due to a combination of genetic and environmental factors (Ayesha Khan *et al.*, 2016).

Low birth weight is widely acknowledged to be a public health problem as 20.5 million infants are born each year with the condition globally (WHO, 2019). LBW newborns are at increased risk of developing numerous medical conditions like hypothermia, hypoglycemia, both fetal, and neonatal death, post-neonatal death, neonatal infections, respiratory distress syndrome and necrotizing enterocolitis (Lee *et al.*, 2017; Kassaw *et al.*, 2021; Tchamo *et al.*, 2016). Being LBW baby also presents, long-term morbidities including blindness, deafness, mental retardation, adult-onset chronic non-communicable disease such as hypertension and chronic kidney disease (CKD) (Kanda *et al.*, 2020), and disabilities; poor school performance, poor language development, later depression and intellectual impairments (Lee *et al.*, 2017; Kassaw *et al.*, 2021; WHO, 2014; Wojcik *et al.*, 2013).

During the 65th World Health Assembly, member states of the United Nations set a national objective of a 30% reduction in LBW by 2025 (WHO, 2019). However, between 2000 and 2015, no region reported a significant decrease in LBW prevalence, even both developed and developing countries reported an increment of it is magnitude. For instance, the number of LBW among live births in Sub-Saharan Africa increased from 4.4 million to 5 million between 2000 and 2015 (Blencowe *et al.*, 2019). This figure indicates that the LBW target of 2025 will be unlikely achieved if the current trend is allowed to continue (WHO, 2019).

The government of Ethiopia has also recognized the severity of the problem and has been putting in place various solutions using a variety of implementations. These implementations are emphasized on the care packages delivered during the prenatal, perinatal, intra-natal, and postnatal periods (Endalamaw *et al.*, 2018). Despite these remarkable efforts, LBW continues

to be a public concern in Ethiopia and is still unacceptably high (Mehare and Sharew, 2020). Therefore, this can be overcome by targeting factors linked to LBW babies to implement important preventive interventions that consider socioeconomic, environmental, obstetric, medical, and lifestyle factors.

## **1.2. Statement of the problem**

Globally, the prevalence of LBW was estimated to be between 15.5 and 20% (WHO, 2019). According to the 2019 UNICEF and WHO report, low and middle-income countries had the largest burden of LBW (97%). For example, South Asia had 28%, Sub-Saharan Africa had 13%, and Latin America and the Caribbean had 13% respectively (WHO, 2019). A study based on data from ten countries shows the prevalence of LBW in Africa ranged from 10% in Uganda to 15.7% in Senegal. An estimated 5.7 million infants born with LBW in Africa each year (He *et al.*, 2018). In Ethiopia, a systematic and meta-analysis review reported the prevalence of LBW was found to be 26.9% in 2021, which indicated the problem is still unacceptably high (Kassaw *et al.*, 2021).

Despite improvement in the maternal and child health care, more than 4 million babies death occurs globally during their first four weeks of life with LBW being a major indirect cause of mortality. LBW newborns account for more than 80% of all neonatal deaths worldwide (Vundli Ramokolo and Sanders, 2018; Blencowe *et al.*, 2019). According to a recent report from World Health Organization (WHO), the slow progress in the reduction of LBW has impeded the global efforts to prevent unnecessary newborn death and reduce the number of children suffering from wasting and stunting (WHO, 2019; Bater *et al.*, 2020).

Newborns with birth weights less than 2,500gm have a 20-fold higher risk of developing complications and neonatal death and those who survived had a higher risk of growth retardation and neurodevelopmental delays (Atitwa, 2015; Tchamo *et al.*, 2016). In addition to mortality and morbidity, caring for LBW newborns imposes considerable burden or expenses to the family, hospital, government and society as a whole (Adam *et al.*, 2019). Furthermore, LBW increases the risk of many labor complications such as irregular heart rate patterns during labor, low Apgar scores <7 at both first and fifth minutes, risk of sudden cardiac death in the young people and women giving birth to LBW have a higher risk of elective cesarean delivery or labor induction (Coutinho *et al.*, 2011; Waaler Loland *et al.*, 2021). In Ethiopia, LBW is the significant

leading cause of neonatal mortality and accounted for 4.5% of all deaths according to the latest WHO estimates of 2020 (WHO *et al.*, 2020; Seid *et al.*, 2019).

Even though the Ethiopian government took significant steps to improve maternal and child health during the Millennium Development Goals (MDG) (FMOH, 2015), the EDHS report showed that neonatal mortality has been increased slightly from 29 in 2016 to 33 deaths per 1,000 live births in 2019. This report indicates that reaching the 2030 Sustainable Development Goal will be challenging if the current trends is kept to continue (EPHI, 2021; Haileamlak, 2015).

Many studies in different settings in the world revealed the contributing factors of LBW as maternal nutrition, obstetric factors, chronic medical illnesses such as cardiovascular disease and HIV/AIDS, intimate partner violence, hard physical labor during pregnancy, maternal behaviour and lifestyle factors, socioeconomic factors, and pregnancy-related complications (Sharma *et al.*, 2015; Alemu *et al.*, 2019; Tessema *et al.*, 2021; Lake and Olana Fite, 2019). Furthermore, women in developing countries or poor communities are more likely to engage in risk factors such as physical demanding work at home and on farms, and they are more likely to have unfavourable birth outcomes including LBW (Borodulin *et al.*, 2008).

Although many studies have been existed in developed and developing countries regarding physically demanding work during pregnancy and LBW, there has been no study in Ethiopia linking physically demanding work during pregnancy with LBW. In addition, The existing LBW research failes to consider contributing factors like intimate partner violence and household food insecurity (Mehare and Sharew, 2020; Demelash *et al.*, 2015; Desta *et al.*, 2020; Jember Desalegn *et al.*, 2020). Therefore, this study aimed to assess the magnitude and factors associated with LBW among neonates born in public Hospitals of North Shewa Zone, Oromia Regional State, Central Ethiopia.

### **1.3. Significance of the study**

This study provides information about risk factors of low birth weight in public hospitals, which is important to know areas of interventions that help to improve maternal and child health. It will also provide reliable evidence for health care providers, zonal health bureaus, hospital managers, and other stakeholders to develop preventive and educational programs for the reduction of neonatal mortality and morbidity related to LBW. In addition, the findings will help



policymakers, planners and other concerning organizations working in the area of maternal and child health to plan various intervention programs based on the identified factors. Likewise, this study could be used as a baseline for further researchers who are interested in conducting researches on the issues in the future.

Furthermore, the finding of this study will contribute to the existed knowledge about predictors of LBW particularly regarding work related physical demanding during pregnancy, IPVP, and food insecurity, which has not been adequately examined in prior studies.

## **1.4. Objectives**

### **1.4.1. General objectives**

To assess the magnitude of low birth weight and associated factors among newborns delivered in the Public Hospitals of the North Shewa Zone, Oromia Regional State, Central Ethiopia from June 15-July 30/2021.

### **1.4.2. Specific objectives**

To determine the magnitude of low birth weight.

To identify factors associated with low birth weight.

## 2. LITERATURE REVIEW

### 2.1. Magnitude of LBW

The prevalence of LBW ranges in the world from 7.3% to 31.4%. The highest prevalence was reported from India (Rajashree *et al.*, 2015) and the lowest from Spain (Hidalgo-Lopezosa *et al.*, 2019). A cross-sectional study employed in Maharashtra, India showed that out of 655 live births 13% were observed to be LBW (Ahankari *et al.*, 2017). Another study done in Iraq revealed that 21.1% out of 225 newborn babies were found to be LBW (AbdalQader *et al.*, 2014). Similarly, a study conducted in various regions reported that the prevalence of LBW was 10.2% in Indonesia, 9.4% to 23.6% in Nepal, and 20% in Bangladesh respectively (Kandel and Kafle, 2017; Bansal *et al.*, 2018; Jahidur Rahman Khan *et al.*, 2018; Siramaneerat *et al.*, 2018)

A study conducted in Africa region also showed the prevalence of LBW ranging from 7.3 % to 29.6%. A cross-sectional study conducted using the 2013 Nigeria Demographic and Health Survey showed that 7.4% newborn was LBW out of 5,189 babies (Dahlui *et al.*, 2016). The highest estimate of LBW was observed in Uganda. A five-year retrospective study done showed that among 3318 live births, 29.6% were reported to be LBW (Abubakari *et al.*, 2015). There is some variation between the regions. Similar Studies conducted across the regions revealed that the prevalence of LBW was found to be 12.3% in Kenya, 10% to 25.5% in Ghana, 13% in Sudan, and 13.4% in Burkina Faso (Muchemi *et al.*, 2015) (Mohammed *et al.*, 2019) (Louis *et al.*, 2016; He *et al.*, 2018) (Saeed *et al.*, 2014).

Similarly, LBW ranging from 8.8 to 34% among newborns delivered in public hospitals in Ethiopia. For instance, a recent study conducted in Southern Ethiopia explored that the magnitude of LBW was 34.1% (Mehare and Sharew, 2020). A similar facility-based study conducted in the Kambata-Tembaro zone reported that the prevalence of LBW was 18% (Alemu *et al.*, 2019). A study conducted in Wolaita Sodo town showed that out of 432 postpartum women, 8.1% were delivered to LBW newborns (Kastro *et al.*, 2018). Another study conducted in this area within the same year also reported that the proportion of LBW was observed to be 15.8% out of 304 newborns delivered in the Hospital (Lake and Olana Fite, 2019). A study conducted in St. Marry hospital and Aksum University specialized and comprehensive Hospital and Dilchora Referral hospital showed that the prevalence of LBW was observed to be 8.8% and 21% respectively (Sema *et al.*, 2019; Aboye *et al.*, 2018). Another

cross-sectional study conducted in Debre Tabor Hospital also reported that the magnitude of LBW was 12.0% (Mekie and Taklual, 2019). In addition, a study done among 358 newborn/mother pairs in health institutions of Dessie town indicated that the prevalence of LBW was 15.6 out of 358 live births (Jember Desalegn *et al.*, 2020).

## **2.2. Factors associated with LBW**

### **2.2.1. Sociodemographic factors**

**Age:** A study employed using Demography and Health Surveys of 10 non-Industrial countries for the years 2010 to 2013 showed that age of the mothers (35 to 49 years) (AOR=1.7; 95% CI: 1.2-3.1) had a significant association with LBW (Mahumud *et al.*, 2017), However, a study conducted in Eastern Nepal showed that mothers' age of 30 or more years were found to be protective for LBW(AOR=0.15; 95% CI: 0.04–0.53) (Bhaskar *et al.*, 2015). A cross-sectional study conducted in India on factors associated with LBW among newborns reported that being <20 years old (AOR= 5.6; 95% CI: 2.5–12.6) were statistically associated with LBW babies (Rajashree *et al.*, 2015). various investigations in Ethiopia also reliably showed that maternal age was a predictor of LBW. A study conducted in Makelle city and Bale zone public hospitals revealed that maternal age of <20 years (AOR = 6.4; 95% CI: 1.93–21.42), (AOR= 3; 95, 95% CI: 1.65–5.73) had a significant association with LBW (Desta *et al.*, 2020; Demelash *et al.*, 2015).

**Marital status:** A study done in health facility of Dilla Town among 472 participants were showed that the likelihood of delivering LBW among divorced mothers were 2.5 times higher than that (AOR=2.57; 95% CI: 1.43-4.61 of married mothers (Mehare and Sharew, 2020). This result was supported by finding from a study conducted in Sub-Saharan Africa which states that the probability of delivering LBW was 22% higher among mothers who were not living with their partner in contrast with the ones who were living with a partner (AOR = 1.22; 95% CI: 1.16-1.28) (Tessema *et al.*, 2021). Another study employed in Spain revealed that being single mothers (AOR=1.18; 95%CI: 1.14–1.22) or separated /divorced (AOR=1.13; 95% CI: 1.04–1.23) were positively associated with LBW (Hidalgo-Lopezosa *et al.*, 2019). A study done in Ghana also showed living alone during pregnancy (AOR=3.9; 95% CI: 1.3–11.7) had a significant association with LBW babies (Adam *et al.*, 2019).

**Educational status:** Concerning educational level, a study conducted in Ghana reported that the odds of delivering LBW among mothers with secondary education (AOR=4.19; 95% CI: 1.45–12.07) were four times higher than that of mothers with tertiary education (Adam *et al.*, 2019). A study conducted in California explored that the probability of having LBW was 36% higher among women with less than a high school diploma (AOR= 1.36; 95% CI: 1.34–1.39) contrasted to women who finished high school diploma and above (Ratnasiri *et al.*, 2018). A study conducted using data from 35 Sub-Saharan countries reported that the odds of delivering LBW among mothers whose husbands completed primary education and above were 11% less (AOR = 0.89; 95% CI: 0.84-0.94) contrasted to their counterparts (Tessema *et al.*, 2021). Similarly, a study conducted in southern Ethiopia also showed giving birth to LBW newborns were common among mothers whose educational status was below secondary school (AOR=5.86; 95%CI: 1.64-20.9) (Kastro *et al.*, 2018).

**Residence:** A cross-sectional survey done in five hospitals of the Northern region of Ghana showed that the residential status of the mothers (rural) ( $p < 0.001$ ) was a significant factor associated with LBW (Abubakari *et al.*, 2015). Also, a study conducted in Kambata-Tembaro zone, Ethiopia showed being a rural residence (AOR=5.4; 95% CI: 2.1-14.7) was significantly associated with LBW. In addition, a study done in southern Ethiopia revealed that the probability of having LBW among mothers who were rural residents were 7 times higher than that of Urban residents (AOR=6.78; 95% CI: 3.51, 13.08) (Mehare and Sharew, 2020).

**Occupation:** A study carried out in the Kambata-Tembaro zone, southern Ethiopia reported that the odds of having LBW among mothers who had no employment were 5 times higher than that of employed (AOR=5.4; 95% CI: 1.7-17.4) (Alemu *et al.*, 2019).

### **2.1.2. Obstetric related factors**

**Birth interval:** A cross-sectional study conducted in India among 222 study participants revealed that interpregnancy interval of <2 years (AOR=5.34: 95% CI: 1.50–19.05) was a significant risk factor associated with LBW (Kandhasamy and Singh, 2015), while a study done using data from Demography and Health Surveys of 10 non-industrial nations showed that delayed conception (over  $\geq 48$  months) was a significant factor associated with LBW infants In Armenia (AOR=2.8; 95% CI: 1.6-4.1), Jordan (AOR=2.2; 95% CI: 1.4-3.3), Tanzania

(AOR=2.4; 95% CI: 1.1-5.4), Uganda (AOR=2.2; 95% CI: 1.2-3.5) respectively (Mahumud *et al.*, 2017).

**History of Abortion:** A cross-sectional study done in Dasse town and Pakistan recognized that history of abortion (AOR=2.31; 95% CI: 1.20-4.44) or having past unsuccessful labour (AOR=1.22; 95% CI: 1.06-2.35) were among the significant factors associated with LBW babies (Habib *et al.*, 2018). A report of a population-based study carried out in Bangladesh also showed a significant association between LBW and mothers who had a history of terminated pregnancies (AOR=1.28; 95% CI: 1.05-1.57) (Khan *et al.*, 2020).

**Pregnancy type:** A study done in northern Ethiopia explained that women who needed the pregnancy were 97% less likely to have LBW babies in contrast to women's who had undesirable pregnancy (AOR = 0.027; 95% CI: 0.004–0.207), and the probability of delivering LBW among mothers who had a history of abortion were 2.4 times higher in contrast to mothers who had not the history of abortion (AOR = 2.423; 95%CI: 1.744–15.317) (Gebregzabihher *et al.*, 2017). According to a study done based on nationwide data in Bangladesh, having unwanted pregnancy (AO=1.22; 95% CI: 1.03-1.44) had significantly associated with LBW compared to their counterparts (Khan *et al.*, 2020).

**Anaemia:** Anemia during pregnancy was also associated with low birth weight. A study done in India indicated that anaemia during pregnancy (AOR=3.08; 95% CI: 2.58–5.76) was strongly associated with LBW (Kandhasamy and Singh, 2015; Pal *et al.*, 2020). Similarly, a study done in Pakistan showed that having LBW babies was 2.6 times higher among Anemic pregnant mothers (haemoglobin < 110 g/L) (AOR=2.67,95% CI: 1.65–5.24) (Habib *et al.*, 2018). A study conducted in southern Ethiopia also reported the likelihood of delivering LBW among anaemic mothers during pregnancy was nearly 4 times higher compared to non-anaemic mothers (AOR=3.808; 95 %CI: 1.513- 9.586) (Lake and Olana Fite, 2019).

**Complicated pregnancy:** A study conducted among 346 mothers in Kenya, demonstrated that the odds of delivering LBW among mothers who had premature rupture of membranes were 2.9 higher than that of counterparties (AOR=2.95; 95% CI: 1.14-7.62) (Muchemi *et al.*, 2015). A cross-sectional study conducted in Iran also states that mothers with a history of leakage (AOR=4.46, 95%CI: 2.11-9.42) had 4.5 times higher odds of delivering LBW contrasted to their counterparts (Mirzarahimi *et al.*, 2013). Similarly, a study done in Hawassa explored that the

presence of pregnancy-related complications during pregnancy (AOR = 2.96; 95%CI: 1.55-5.64) had a significant association with LBW (Siyoun and Melese, 2019).

A similar study conducted in southern Ethiopia also reported that the probability of having LBW among mothers who had a history of hypertension during the current pregnancy was 6 times higher in contrast to the ones who had not the history of hypertension during current pregnancy (AOR=6.955, 95%CI: 2.386-20.275) (Lake and Olana Fite, 2019). Furthermore, a cross-sectional study employed in Iran indicated bleeding or spotting during pregnancy (AOR=2.36, 95%CI: 1.41-3.95), and preterm birth (AOR=2.84, 95%CI: 1.20-6.71) were factors altogether significantly associated with LBW separately (Mirzarahimi *et al.*, 2013).

**ANC:** A facility-based study done in southern Ethiopia reported that the probability of having LBW among mothers who had not attended antenatal care was 2 times higher than that of mothers who had attended ANC a least one contact (AOR=2.3; 95% CI: 1.3-2.7) (Alemu *et al.*, 2019). A study conducted in the health facility of Dessie Town also showed that having LBW among mothers who had not attended ANC was 3.79 times higher in contrast to mothers who had ANC visits (AOR=3.79; 95%CI: 1.08–13.23) (Jember *et al.*, 2020). Furthermore, A study employed in Rwanda reported that antenatal care visits ( $p=0.025$ ) were positively predicted LBW (Murekatete *et al.*, 2020).

**Previous LBW:** A study conducted in Kenya among 327 participants showed that history of LBW delivery (AOR=5.07; 95% CI: 1.53-14.24) was independently associated with LBW (Muchemi *et al.*, 2015). A study done in Bangladesh also reported that birth orders of >3 with birth interval <24 months were (AOR=1.68, 95% CI: 1.18-2.37) among risk factors significantly associated with LBW babies (Khan *et al.*, 2020).

**Birth order:** A cross-sectional review carried out in the United Arab Emirates, showed that 1st order of birth (AOR= 1.98; 95%CI: 1.35-2.89) were significantly explained LBW (Taha *et al.*, 2020). Another study carried out in California also revealed that mothers who were primiparas (AOR= 1.57; 95% CI: 1.55–1.58) or multiparous with 6 to 12 births (AOR=1.20; 5% CI: 1.17–1.25) had 57%, 20% higher odds of delivering LBW babies in contrast to multiparous women with 2 to 5 births respectively (Ratnasiri *et al.*, 2018).

**Mode of Delivery:** A study conducted in the United Arab Emirates showed that the odds of being LBW among babies who were delivered by CS were 2.5 times higher in contrast to babies born through spontaneous vaginal delivery (AOR=2.35; 95% CI: 1.48-3.73) (Taha *et al.*, 2020). Similarly, a study conducted in Nepal reported that CS mode of delivery (AOR=2.19; 95%CI: 1.21–3.97) was among factors that were significantly associated with LBW (Shrestha *et al.*, 2020). Another study done in Brazil on LBW and its associated factors likewise showed that cesarean section was independently predicted LBW (P=0.007) (Moreira *et al.*, 2018). However, this finding is in contrast with the study done in northern Ethiopia, which identified that cesarean (AOR = 0.415; 95%CI: 0.183–0.941), and instrumental (AOR = 0.574;95% CI: 0.333–0.987) modes of delivery had a protective effect on LBW (Hailu and Kebede, 2018).

### **2.1.3. Comorbidity**

**Chronic illness:** A study conducted among 2611 births in India revealed that women who had a history of chronic illness were 2 times higher odds of delivering LBW in comparison to their counterparties (AOR=2.09; 95% CI: 1.38-3.15) (Pal *et al.*, 2020). Also, a cross-sectional study conducted in northern Ethiopia showed that the likelihood of having LBW among mothers who were reactive for HIV was 6 times higher than that of the mothers who were non-reactive (AOR = 6.12; 95% CI: 1.21–30.90) (Gebregzabihherher *et al.*, 2017). One more study conducted in Cameroon also depicted that maternal HIV infection (AOR = 11.2; 95 % CI: 1.5 – 82.6) was an independent factor associated with LBW (Njim *et al.*, 2015).

### **2.1.4. Maternal behavioural factor**

**Alcohol:** A latest cross-sectional study carried out in Ghana explored that the odds of having LBW among women's who drunk alcoholic beverages were 6 times higher than that of mothers who did not drunk (AOR = 5.93; 95% CI: 1.22–28.84), and food taboos during pregnancy were independently associated with LBW(AOR = 3.3; 95% CI: 1.02–10.77) (Abdulai Abubakari *et al.*, 2019). A stud employed in southern Ethiopia likewise depicted that the likelihood of delivering LBW among mothers who drunk alcohol during the current pregnancy was 8 times higher in contrast to mothers who did not drink alcohol during current pregnancy (AOR=8.111; 95%CI: 2.359-27. 895) (Lake and Olana Fite, 2019).

**Smoking:** A study conducted in California showed that smoking during the 1<sup>st</sup> and 2<sup>nd</sup> trimesters of pregnancy (AOR=1.98; 95% CI: 1.92–2.04) was positively explained LBW (Ratnasiri *et al.*,

2018). A study carried out in eastern Ethiopia likewise reported smoking during pregnancy was significantly predicted LBW. Pregnant women who smoke a cigarette during pregnancy were 4 times (AOR = 3.97, 95% CI: 1.59, 9.88) higher odds of delivering LBW than one who did not smoke (Sema *et al.*, 2019).

### **2.1.5. Nutritional factor**

**Malnutrition:** A study done in Kenya showed that MUAC <23 cm) (AOR= 2.57; 95% CI: 1.15–5.78) was significantly associated with LBW (Nyamasege *et al.*, 2019). A similar study conducted in the USA also identified that underweight women (BMI < 18.5 kg/m<sup>2</sup>) had 1.5 fold higher odds of delivering LBW infants in comparison to women of normal weight (AOR=1.49; 95% CI: 1.46–1.52) (Ratnasiri *et al.*, 2018).

**Nutrition:** A study done in Nepal and Ethiopia revealed that nutritional advising (AOR=4.05; 95% CI: 1.95-8.38), and additional meal (AOR=3.25; 95% CI: 1.64, 6.44) during index pregnancy were observed to be significant factors associated with LBW babies (Sharma *et al.*, 2015; Ahmed *et al.*, 2018), while a similar study report in Addis Ababa found that nutritional counselling during pregnancy was not significantly predicted LBW (AOR=0.508; 95% CI: 0.188-1.369) (Mulu *et al.*, 2020).

A cross-sectional study employed in Bangladesh showed that mothers living in food-insecure households had 38% (AOR=1.38; 95% CI: 1.19-1.59) higher odds of delivering LBW babies compared to mothers living in the food-secure household (Chowdhury *et al.*, 2018). A similar study conducted in Addis Ababa, Ethiopia also showed that the odds of delivering LBW newborns among mothers living in a household with food-insecure was 3.6 times higher than that of mothers living in a household with food-secure (AOR=3.6; 95% CI: (1.79 -7.16)(Sahlu *et al.*, 2020).

**Iron supplementation:** A study carried out in northern Ethiopia explained that women who took iron were 99% fewer odds of having LBW babies than their counterparties (AOR = 0.007; 95% CI: 0.000–0.119) (Gebregzabihherher *et al.*, 2017). Similarly, a case-control study conducted in Nepal explored that the likelihood of having LBW was 3 times higher among women who took iron less than 180 tablets (AOR=3.2, CI: 1.7–5.7) than their counterparties (Anil *et al.*, 2020)



**Additional meal:** A study employed in India showed that mothers who had no extra meal intake during pregnancy (AOR=2.19; 95% CI: 1.30-3.67) were 2 times higher odds of having LBW in contrast to their counterparts (Gupta *et al.*, 2019). A similar study conducted in Amhara regional states also states mothers with no extra meal intake during the last pregnancy (AOR=5.0; 95% CI: 1.2-16.2) were 5 times higher odds of delivering LBW babies (Talie *et al.*, 2019).

#### **2.1.6. Maternal lifestyle factor**

**Hard physical work:** A study done in Nepal at Tertiary Hospital revealed that hard physical work during the current pregnancy (AOR=1.48; CI: 0.97–2.26) was an independent factor significantly associated with LBW (Sharma *et al.*, 2015). Similarly, a study conducted in Cairo also revealed physically hard work (AOR=2.96; 95% CI: 1.93-4.55) was a significant risk factor associated with LBW (El-Moselhy *et al.*, 2012). A study conducted in southern Ethiopia also revealed that the likelihood of having LBW was 3.4 times higher (AOR=3.37; 95% CI: 1.14–9.93) among mothers who were engaged in a job that requires prolonged standing (>3hrs/per day on average) than that of mothers who were not engaged in such types of activities (Legesse *et al.*, 2020).

**Rest during pregnancy:** A study conducted in two tertiary level hospitals of Nepal among 368 mothers showed rest in day time for <2 hours (AOR=3.68; 95%CI: 2.01-6.75), and rest in night time for <8 hours (AOR= 5.76; 95% CI: 2.32-14.33) were the significant risk factors associated with LBW (Dilip Kumar Yadav *et al.*, 2019). Another study carried out at a tertiary-care hospital in India for 2 months indicated that daytime rest during pregnancy <2hr (AOR=5.3; 95%CI: 1.84–15.43) was a significant factor associated with small size babies at birth (Rajashree *et al.*, 2015).

**Intimate partner violence-related factor:** Evidence from the most recent nationwide population-based study in Bangladesh showed that the likelihood of delivering LBW among women who were exposed to IPVP was 1.2 times higher than that of mothers who were not exposed to IPVP (AOR=1.23; 95% CI: 1.05-1.45) (Khan *et al.*, 2020). Another study carried out in Moshi–Tanzania on 1112 pregnant women showed that the odds of having LBW among women exposed to physical IPV were 3 times higher than that of women without physical violence (AOR=3.2; 95%CI: 1.3–7.7) (Sigalla *et al.*, 2017). Similarly, a study conducted in the Kambata-Tembaro zone southern Ethiopia indicated women who had a history of intimate

partner violence during pregnancy had 2 fold higher probability of LBW compared to their counterparts (AOR=2.1; 95% CI: 1.1-3.9) (Alemu *et al.*, 2019).

#### **2.1.7. Neonatal factor**

A study conducted in Kenya among 327 participants revealed that infant sex (a female infant) was significantly associated with LBW (AOR=3.37; 95%CI: 1.14-10.00) (Muchemi *et al.*, 2015). A study conducted in sub-Saharan Africa also showed the odds of delivering LBW among female newborns were 30% higher than that of male newborns (AOR = 1.30; 95% CI: 1.25, 1.35) (Tessema *et al.*, 2021).

### 2.3. Conceptual framework

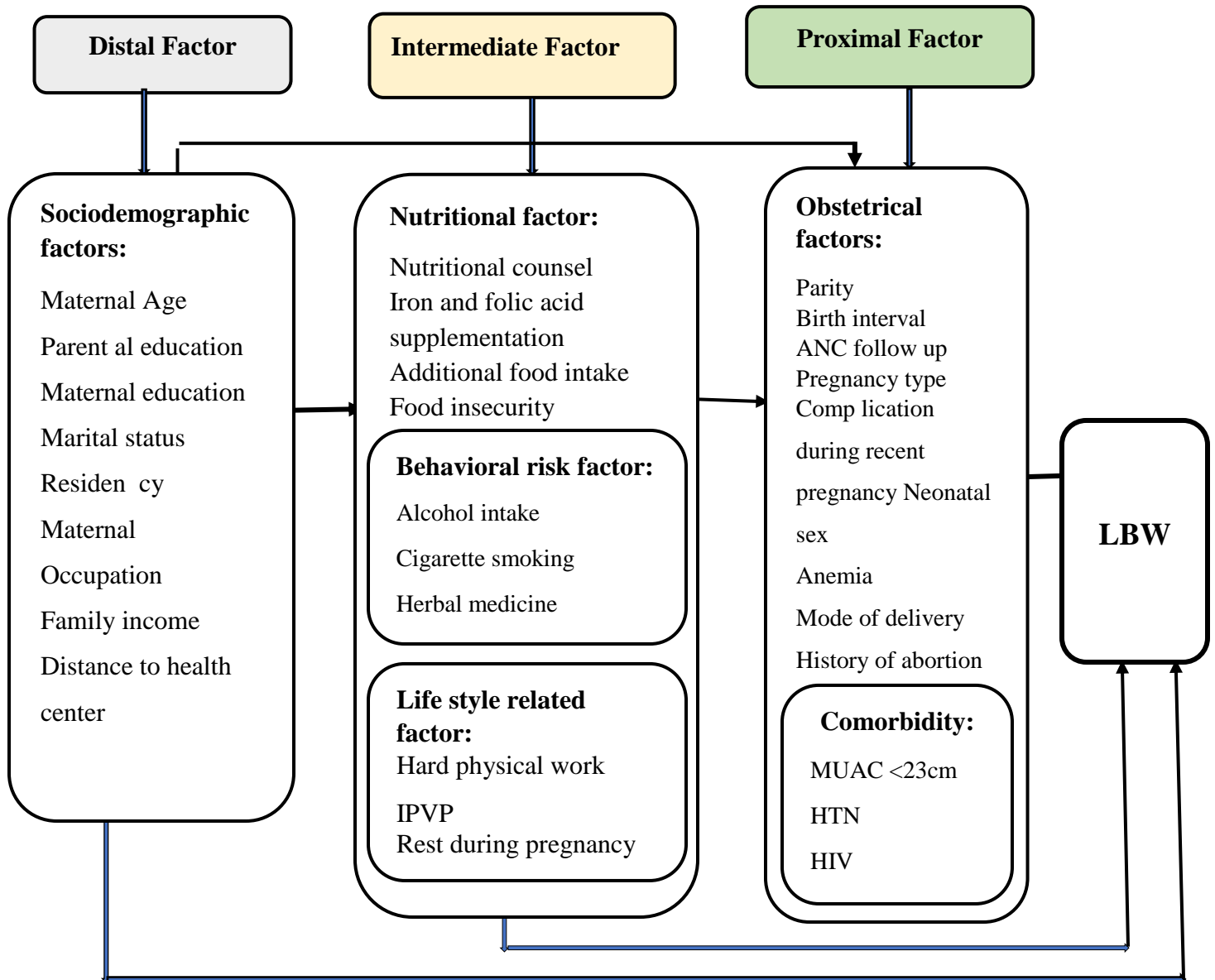


Figure 1 Conceptual framework of magnitude and associated factor of low birth weight, 2021

**Source:** adapted from the previous literature included in the study (Adam *et al.*, 2019; Rajashree *et al.*, 2015; Ratnasiri *et al.*, 2018; Berhanie *et al.*, 2019; Demelash *et al.*, 2015).

## **3. METHODS**

### **3.1. Study area and period**

This study was conducted at public Hospitals of North Shewa Zone, Oromia regional state. North Shewa zone is one of the 20 zones in Oromia Regional State and its administrative Town is Fiche Town; located 112 km away from Addis Ababa, a capital city of Ethiopia. The zone is administratively divided into 13 districts and two towns' administrations. As per the 2021 census, the zone has a total population of 1,786,067, of whom 876,252 were men and 909,815 were women. However, based on the population projection of 2020, the current population of the zone was approximated to be 1.786,067 (CSA, 2021). In terms of health facilities, North Shewa zone has five public hospitals, 63 health centres, 267 health posts with a total of 2,779 health care workers in health institutions (Health, 2021). The five governmental hospitals are namely; Fiche General Hospital, Kuyu General Hospital, Kundomeskel Primary Hospital, Shano primary Hospital, and Muka Turi primary hospital. Those Hospitals provide multidimensional health care services for the catchment's areas population. These all Hospitals have different service areas such as medical, surgical, paediatrics, NICU, psychiatry, gynaecology, obstetric ward, operation room, OPD department, Emergency unit, MCH. The study was conducted from June 15 –July 30/ 2021

### **3.2. Study design**

A Hospital-based cross-sectional study design was employed.

### **3.3. Populations**

#### **3.3.1. Source of population**

All newborns who delivered in Public hospitals of North Shewa Zone.

#### **3.3.2. Study population**

All alive newborns with their mothers who gave births in selected Public hospitals of North Shewa Zone from June 15, 2021, to July 30, 2021.

### **3.4. Inclusion and exclusion criteria**

#### **3.4.1. Inclusion criteria**

All alive newborns with their mothers who gave births in selected Public hospitals of North Shewa zone.

### 3.4.2. Exclusion criteria

Mothers in critical health conditions were excluded from the study.

### 3.5. Sample size determination

**For the magnitude of LBW:** The sample size was determined using a single population proportion formula with the following assumptions; The estimated proportion of LBW was 21.6% (from a similar study conducted in Northwest Ethiopia (Alebel *et al.*, 2019), 95% confidence level, 4 % degree of precision, and 10% non-response rate.

$$n = \frac{(Z_{\alpha/2})^2 * p(1-p)}{d^2}, \text{ where}$$

n= the minimum sample size required.

$Z_{\alpha/2}$  = the standard value of confidence level of alpha=95%

p=estimated proportion of low birth weight.

d= margin of error, by using the above equation the sample size calculated as follows.

$$n = \frac{(1.96)^2 * 0.21(1-0.21)}{(0.04)^2} = 406.5437 \sim 407 \text{ by adding non-response rate (10\%)}$$

The final sample size estimated for the first specific objective was 448.

**The sample size for the second objective:** To determine the sample size for factors significantly associated with low birth weight, Epi info 7 software Stat Cal was used along with the following assumptions:

The confidence level of 95%,

power=80%

10% non-response rate

The ratio of exposed to unexposed 1:1

Table 1 Sample size calculation for factors associated with low birth weight among newborns delivered in public hospitals of the North Shewa, Central Ethiopia, 2021.

Variables	Low Birth Weight		AOR	Sample size	Reference
	Non-exposed	Exposed			
Smoking during pregnancy	No (21.8) %	Yes (46.6) %	3.97	141	(Sema <i>et al.</i> , 2019)
Anaemia	No (11.2) %	Yes (24.1) %	3.0	335	(Lake and Olana Fite, 2019)
Residence	Urban (12.7) %	Rural (26.3) %	3.5	308	(Jember Desalegn <i>et al.</i> , 2020)

Note: The largest sample size is found to be 407 from the first objective and by adding a 10% non-response rate, the final sample size was 448.

### 3.6. Sampling techniques and Procedure

There are five public Hospitals in North Shoa Zone. However, Muka Turi Primary Hospital was excluded since it was changed to Covid-19 centre. Thus, four public hospitals were included in this study. Averagely, a total of 1080 newborns were delivered in four public hospitals during the study period as estimated from their respective average flow of deliveries of the last 3 preceding months. The average flow of deliveries during the study period for each hospital was: 345 mothers were from Kuyu General Hospital, 390 from Fiche General Hospital, 195 from Kundomeskel Primary Hospital, and 150 from Shano Primary Hospital. The calculated sample size was proportionally allocated to each hospital based on their respective average of delivery uptake using the following formula.

$$n_i = n_f \cdot N_i / N$$

Where N=Total estimated deliveries from all hospitals during the study period

$N_i$ =Number of estimated deliveries from each hospital during the study period

$n_i$ = Estimated sample to be drawn from each hospital

$n_f$ =Total sample size to be drawn from all Hospital

The first interviewed mother was selected by a lottery method from  $K^{\text{th}}$  interval for each hospital independently, and the next mothers were selected at a regular interval every 2 individuals ( $K=1080/448=2.4\sim 2$  as shown in (Figure 2).

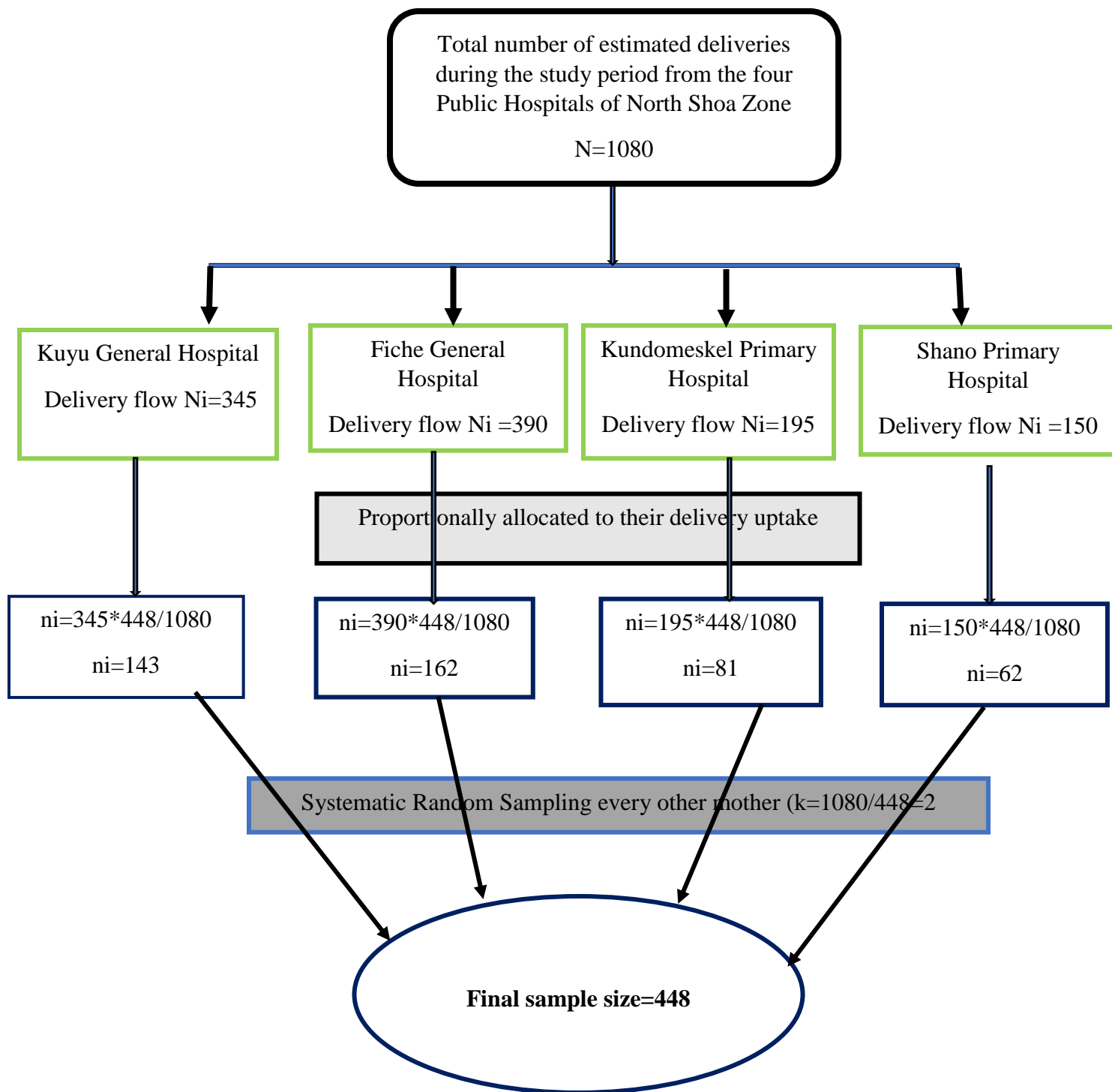


Figure 2 Schematic Representation of sampling procedure for study on the magnitude of LBW and associated factors among newborns delivered in public hospitals of the North Shewa, Central Ethiopia, 2021.

## **3.7. Data collection methods and procedures**

### **3.7.1. Data collection tools**

A pretested and structured interviewer-administered questionnaire and medical record extraction were used. The questionnaire was adapted and modified from Ethiopian Demographic Health Survey (EDHS) 2011 and other peer-reviewed articles (CSA, 2011; Abubakari *et al.*, 2015; Adam *et al.*, 2019; Kargbo *et al.*, 2021; Agarwal *et al.*, 2001; Demelash *et al.*, 2015; Coates J *et al.*, 2007). The questionnaire contained different sections like women's socio-demographic characteristics, obstetric-related factors, nutritional-related factors, intimate partner violence, Household food insecurity, neonatal, and maternal behaviour-related factors. Intimate Partner Violence during Pregnancy (IPVP) was measured using a standardized and validated tool developed by (WHO, 2005). Food insecurity was assessed using a Household Food Insecurity Access Scale (HFIAS) developed by Food and Nutritional Technical Assistance (FANTA) (Coates J *et al.*, 2007). The tools were tested and validated in Ethiopia with Cronbach's alpha value of 0.85 for both rural and urban samples (Gebreyesus *et al.*, 2015). As well as physical demanding work during pregnancy was measured using eleven items from similar studies (Sharma *et al.*, 2015) (Agarwal *et al.*, 2001; El-Moselhy *et al.*, 2012). In this study, the internal consistency of physical demanding work items was (Cronbach's alpha=0.82).

### **3.7.2. Data collectors**

The data were collected by trained four BSc midwives and two BSc nurses. Two BSc midwife supervisors were assigned to coordinate, facilitate and supervise the overall activity during the data collection period.

### **3.7.3. Data collection procedure**

The data were collected through face to face interview using pretested questionnaire from the mothers and variables like neonatal birth weight, pregnancy complication, maternal haemoglobin, and gestational age were extracted from the delivery registration book and mother's card. The Maternal-Upper Arm Circumference (MUAC) was measured to the nearest 0.1 cm on the left arm using a non-stretchable standard tape. The gestational age of the baby at birth was determined from medical records documented by the midwife. These records are usually obtained through self-report of the mother's last menstrual period and ultrasound report which the midwife used to estimate the gestational age. The data collection was done for one month and two weeks (from June 15-July 30), 2021.



### 3.8. Variables

**3.8.1. Dependent variable:** Low birth weight.

#### 3.8.2. Independent variables

**Socio-demographic factors:** maternal age, religion, marital status, education, occupational status of the mother and father, monthly income of the family.

**Obstetric factors:** Gestational age, parity, ANC, pregnancy-related complications during pregnancy, anaemia, history of abortion, PROM, APH, history of prenatal iron supplementation, and birth-to-birth interval.

**Nutritional factors:** Maternal MUAC, nutritional counselling during pregnancy, additional meal intake, food insecurity.

**Neonatal factors:** Infant's sex.

**Comorbidity:** AIDS, chronic hypertension, chronic kidney disease, and heart disease.

**Life style-related factor:** Intimate partner violence during pregnancy (IPVP), Physical demanding work during pregnancy.

**Maternal Habit/behaviour During pregnancy:** Drinking alcohol during pregnancy, smoking during pregnancy, passive smoking.

### 3.9. Operational definition

**Low birth weight:** Newborns who weighed less than 2500 gm were considered as LBW (WHO, 2014).

**Birth interval** is the time between the current date of conception and the preceding baby's birth date (Jafari *et al.*, 2010). It has three categories, these are: <24 monthes, between 24-47 monthes, and  $\geq 48$  monthes (Mahumud *et al.*, 2017).

**Alcohol use:** use of any amount unit of alcohol whether it is locally manufactured drinks (Tela, Teje, Areka), or beer, wine, and any alcoholic-liquors beverages (Lake and Olana Fite, 2019).

**Cigarette smoking:** use of any tobacco product regardless of amount or frequency throughout the current pregnancy (Lake and Olana Fite, 2019).

**Herbal medicine:** use of any herbal material and completed herbal product including active elements from plants, other plant materials, or mixtures from a traditional healer even for once (Lake and Olana Fite, 2019).

**Undernutrition:** mothers with mid-upper arm circumference (MUAC) < 23 cm (Ververs *et al.*, 2013).

**Physical demanding work during pregnancy::** Participants who replied  $\geq 4$  affirmative responses to the 11 items related to regular work assessment during pregnancy (Agarwal *et al.*, 2001; Sharma *et al.*, 2015).

**Intimate partner violence during pregnancy (IPVP):** Women who replied "yes" to at least one of the 13 questions related to sexual, psychological, and physical violence (Ashenafi *et al.*, 2020).

**Food secure:** Participants who replied  $\leq 2$  affirmative responses to the nine questions of the food access scale (Coates J *et al.*, 2007).

**Food insecurity:** Participants who replied  $> 2$  affirmative responses to the nine questions of the food access scale (Coates J *et al.*, 2007).

### **3.10. Data quality control**

To assure the quality of data, a questionnaire was evaluated by experts in the related field. The questionnaire was first developed in English language, then translated into Afaan Oromo and Amharic, with a back-translation into English to ensure consistency. A pre-test was conducted in Chanco primary Hospital, which is located in a special zone of the Oromia region, on 5% (24) of the total sample size to check for language clarity, estimate the time required for the interview, and necessary amendments were done accordingly. Before the actual data collection, training was given for data collectors and supervisors by the principal investigator on the study's objective, sample procedure, questionnaire content, the confidentiality of information, respondent rights, and interview procedures. Finally, the principal investigator together with the supervisor checked the data for completeness on daily basis to solve the problem at a time.

### **3.11. Data processing and analysis**

The data were checked, cleaned, coded, and entered into Epi data statistical software version 3.1 and then exported to SPSS version 26 for analysis. Simple frequency, summary statistics median, and interquartile range were generated as descriptive statistical analysis. The results were then presented using frequencies, tables, and figures. The outcome variable was coded as "1" for LBW whereas "0" for others.

Food insecurity was assessed using nine items with (Yes or No) response. Responses were summed and participants who scored  $>2$  affirmative answers were considered as food insecure whereas those who replied  $\leq$  were considered as food insecure (Coates J *et al.*, 2007).

Intimate partner violence during pregnancy was measured using 13 items with (Yes or No) response. Women who replied "yes" to at least one of the 13 questions related to sexual, psychological, and physical violence were coded as "having experienced IPV" and whereas women who answered "no" to all of the questions were coded as not exposed to IPV (Ashenafi *et al.*, 2020; WHO, 2005).

Physical demanding work during pregnancy was measured using eleven (11) items with (Yes or No) responses. The sum of scores ranging from 0-11, which had two categories; participants who replied  $\leq 3$  affirmative responses were coded as not engaged in hard physical work whereas those who replied  $\geq 4$  positive responses were coded as engaged in hard physical work 4-11 (Agarwal *et al.*, 2001; Sharma *et al.*, 2015).

Bivariable and multivariable binary logistic regression analyses were used to see the association between independent variables and the outcome. To control all possible confounders, all variables with P-value  $< 0.25$  in the bivariable analysis were retained for the final model multivariable analysis. The multi co-linearity test was also used to examine if there was any correlation between independent variables using VIF and tolerance tests; no variables with VIF  $>10$  and tolerance test  $<0.1$  were found. The Hosmer-Lemeshow and the Omnibus test were used to test the model's goodness of fit. The model was deemed to be a good fit since the result was found to be insignificant for the Hosmer-Lemeshow test ( $p=0.616$ ) but significant for the Omnibus test ( $p=0.000$ ).

The strength and direction of statistical association were measured by an adjusted odds ratio with 95% CI. Furthermore, in multivariable regression, a P-value less than 0.05 was considered to declare as a statistically significant association.

### **3.12. Ethical consideration**

Ethical clearance was obtained from Haramaya University, College of Health and Medical Sciences, Institutional Health Research Ethics Review Committee (IHRERC). An official letter of permission and support was presented to the north Shewa zone health bureau from Haramaya University. The North Shewa zone health bureau administrative bodies wrote a formal letter of

permission to each hospital. Further permission was also secured from each of the hospital's Obstetric ward heads. Before interviewing, data collectors explained the objective, benefits, and risks of the study to the participants to obtain informed consent. Respondents were informed that they had the right to refuse or withdraw from the study at any time if they so desired. Participants in the study were also informed about the attainment of confidentiality of the information they provided. After Receiving “Informed Voluntary Written and Signed Consent” from the heads of Hospitals and parents/guardians of participants data was collected. Furthermore, for those participants under the age of 18 informed voluntary written and signed consent was obtained from a parent or guardian utilizing standard disclosure procedures. During the data collection process/period, normal safety precautions for the prevention of COVID-19 were followed and carried out.

## 4. RESULTS

### 4.1. Socio-Demographic Characteristic

In this study, of 448 sampled populations, 441 delivered mothers-newborn pairs were included in the study, resulting in a response rate of 98.4%. The median and interquartile range ( $\pm$ IQR) of the study participants age was 25 ( $\pm$ 7) ranging from 18 to 41. Slightly more than two-third, 300 (68%) of the mothers were in the age group of 21–34 years. The majority of the participants (93.2%) were married and more than three-quarters 270 (83.9%) were Orthodox Christians. Nearly more than one third (37.5%) of sampled mothers had no education. In contrast, among their partners, only 79 (17.9%) had no education. Regarding maternal occupational status, more than half (59.9%) of the neonate’s mothers were housewives. The median and interquartile range of household incomes of the respondents were 3000 ETB $\pm$ 1500 per month (Table 2).

Table 2 Sociodemographic characteristics of mothers and neonates who delivered in Public Hospitals of North Shewa Zone, Oromia Region, central Ethiopia, June 15 to July 30, 2021(n=441).

Variable	Frequency	Percentage
Age		
$\leq$ 20 years	87	19.7
21-34 years	305	69.2
>34 years	49	11.1
Religion		
Orthodox	370	83.9
Protestant	57	12.9
Others*	14	3.2
Marital status		
Married	411	93.2
Divorced	21	4.8
Others**	9	2.0
Residence		
Urban	168	38.1
Rural	273	61.9
Level of mother’s education		
No education	165	37.4
Primary education	143	32.4
Secondary education	98	22.2
Higher education	35	7.9
Occupational status of the mothers		
Student	41	9.3
Housewife	264	59.9
Private employee	75	17
Government employee	29	6.6
Merchant	32	7.3

Level of husband's education		
No education	79	17.9
Primary education	123	27.9
Secondary education	143	32.4
Tertiary education	96	21.8
Occupational status of husbands		
Private employee	107	24.3
Government employee	99	22.4
Farmer	185	42.0
Others***	49	11.1
Monthly income in ETB		
<1000	25	5.7
1000-2000	58	13.2
2001-4000	255	57.8
>4000ETB	103	23.4
Sex of newborns		
Male	232	52.6
Female	209	47.4
Distance to the health facility		
<1hr	206	46.7
≥1hr	235	53.3
Family size		
≤5	312	70.7
>5	129	29.3

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ETB, Ethiopian Birr; hr, hour;\*, Muslim, Wakefata;\*\* , Single, Widowed;\*\*\* , Merchant, student

## 4.2 Maternal and child health, and obstetric characteristics

Of the total interviewees, 365 (82.2%) had attended ANC follow-up for their last pregnancies. In terms of pregnancy intentions, slightly more than three fourth (77.8%) of the neonate's mothers desired to have the current pregnancy. Nearly a quarter of the mothers, 109 (22.2%), gave birth to the present newborns within 24 months after the previous childbirth. Concerning the mode of deliveries, 338 (76.6%) of mothers had their babies via spontaneous vaginal delivery. In terms of gestational age at birth, 391 (88.7%) of mothers delivered their babies at full term (Table 3).

Table 3 Obstetric related characteristics of mothers who gave birth in Public Hospitals of North Shewa Zone, Oromia Region, central Ethiopia, June 15 to July 30, 2021(n=441).

Variables	Frequency	Percentage
ANC follow up		
Yes	365	82.8
No	76	17.2
Number of ANC visits (n=365)		
≤three	250	68.6
Four and above	115	31.4
Time of starting ANC visit (n=365)		
≤16weeks	240	65.8
>16weeks	125	34.2
Parity		
Primiparous	129	29.3
Multiparous	242	54.9
Grand multiparous	70	15.9
Type of pregnancy		
Singleton	429	97.3
Multiple	12	2.7
Birth interval (n=312)		
<24 months	68	21.8
24-48 months	159	50.0
>48 months	85	27.2
Pregnancy complications		
Yes	107	24.3
No	334	75.7
Mode of deliveries		
SVD	338	76.6
C/S	74	14.0
Instrumental delivery	29	6.6
Gestational age at delivery		
Term	50	11.3
Preterm	391	88.7
Type of Pregnancy		
Planned and wanted	343	77.8
Unplanned but wanted	85	19.3
Unplanned and unwanted	13	2.9

ANC, Antenatal Care; C/S, Cesarean Section; SVD, Spontaneous Vaginal Delivery

Regarding pregnancy-related complications during pregnancy, among 441 mothers, 107 (24.3%) encountered pregnancy complications. The commonest complications were pregnancy-induced hypertension, severe nausea and vomiting, APH, and PROM (Figure 3).

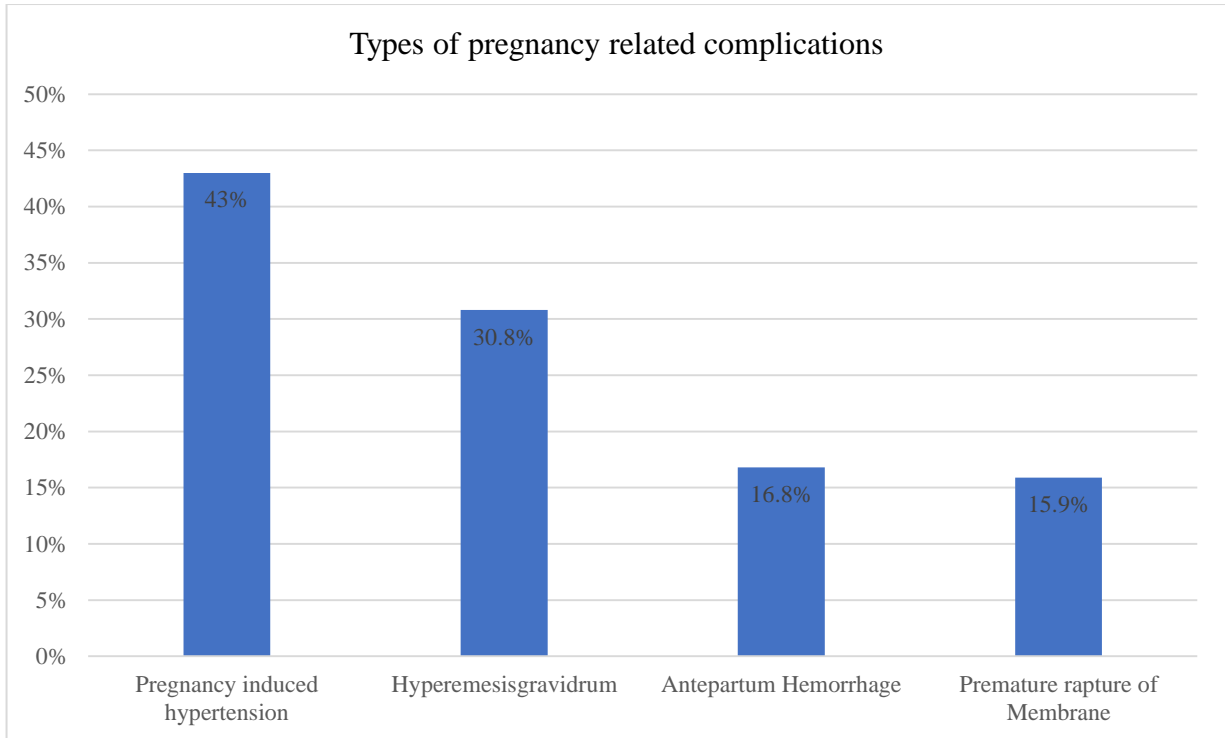


Figure 3 Types of pregnancy-related complications among mothers who gave birth in public hospitals of North Shewa zone, central Ethiopia, June 15 to July 30, 2021 (n=107).

### 4.3 Maternal Nutritional and lifestyle-related characteristics

Of the total study participants, 365 (82.8%) of them were from household food secured and 79 (17.9%) had MUAC less than 23cm. The level of haemoglobin among neonates' mothers ranged from 9.0 g/dl to 16.2 g/dl with median 13.2 g/dl and Q1, Q3 (12.2, 14.2 g/dl) respectively. The proportion of mothers who had engaged in heavy physical work during the current pregnancy was 116 (26.3%). About three fourth, 332 (75.3%) of respondents took iron and folic acid supplements at least once and 225 (67.6%) of them took less than 60 tablets during their recent pregnancy. 198 (44.9%) of mothers had drunk alcohol during their last pregnancies (Table 4).



Table 4 Nutritional, lifestyle, and behavioural characteristics of mothers who gave birth in Public Hospitals of North Shewa Zone, Oromia Region, central Ethiopia, June 15 to July 30, 2021(n=441).

Variables	Frequency	Percentage
Food security status		
Food secured	365	82.8
Food insecure	76	17.2
Engaged in heavy physical work		
Yes	116	26.3
No	325	73.7
Exposed to intimate partner violence		
Yes	187	42.4
No	254	57.6
MUAC		
<23 cm	79	17.9
≥23 cm	362	82.1
Ever drunk alcohol during the current pregnancy		
Yes	198	44.9
No	243	55.1
Took iron tablet during the current pregnancy		
No	109	24.7
<60	114	25.9
60-90	218	49.4
Exposed to person smoked in the surroundings		
Yes	62	14.1
No	379	85.9
Did you take an additional diet during the current pregnancy		
Yes	214	48.5
No	227	51.5
Did you Counseled on nutrition during the current pregnancy		
Yes	269	61.0
No	172	39.0
Did you fast during the current pregnancy		
Yes	206	46.7
No	235	53.3
Have you taken herbal medicine during the current pregnancy		
Yes	49	11.1
No	392	88.9
Haemoglobin level		
<11g/dl	45	10.2
≥11g/dl	396	89.8

MUAC, Mid-Upper Arm Circumference; ANC, Antenatal care.

#### 4.4 Maternal Medical History Related Characteristics

Of the total participants, almost 11 (2.5% ) had a pre-existing medical disease. From this four (36.3%) had chronic hypertension, four (36.3%) were reactive to HIV and two (18.1%) had DM respectively (Table 5).

Table 5: Maternal medical history related characteristics among mothers who gave birth in Public Hospitals of North Shewa Zone, Oromia Region, central Ethiopia, June 15 to July 30, 2021(n=441).

Variables	Frequency	Percentage
Pre-existing medical condition		
Yes	11	2.5
No	430	97.5
Types of medical condition (n=11)		
Chronic hypertension	4	36.3
Diabetes Mellitus	2	18.1
Reactive to HIV	4	36.3
Others*	3	27.2

\*, Urinary tract infection

## 4.5 The magnitude of Low Birth Weight

Of 441 study participants, 78 had low birth weight newborns. Therefore, the magnitude of low birth in the public hospital of the North Shewa zone was 17.7% (95% CI: 14.3, 21.5). The median and interquartile range ( $\pm$ IQR) of birth weight of the newborns was 3000 grams ( $\pm$ 800grams) ranging from 1000 grams to 4500 grams (Figure 4).

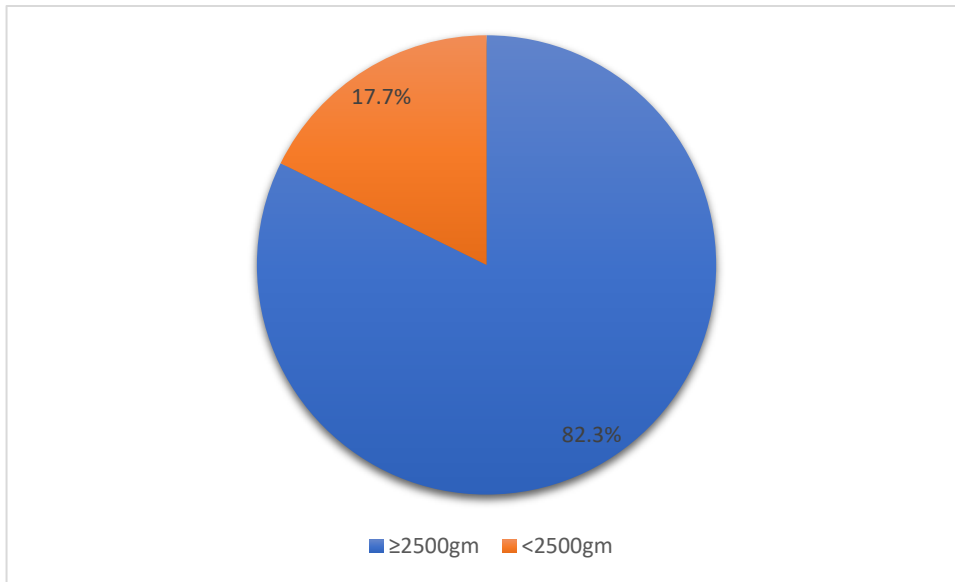


Figure 4 the magnitude of LBW in Public Hospitals of North Shewa zone, central Ethiopia from June 15 to July 30 (n=441).

## 4.5 Factors Associated with Low Birth Weight

Among all variables, age of the mothers, parity, gestational age at birth, pregnancy-related complication, additional meal intake, alcohol intake, ANC follow-up, haemoglobin level <11, physically demanding work during the current pregnancy, food insecurity, MUAC less than 23 cm, and intimate partner violence were significantly associated with LBW at p-value less than 0.25 in bivariable logistic regression. Factors with a p-value <0.25 were included in the multivariable model. Accordingly, parity, pregnancy-related complications, MUAC, food insecurity, physically demanding work during pregnancy, and intimate partner violence were significantly associated with LBW.

In this study, The odds of delivering LBW among mothers from food-insecure households were 2.2 times (AOR=2.22; 95% CI: 1.08,4.55) higher than mothers from food-secure households. Neonates who were delivered from grand multiparous mothers had 2.6 times (AOR=2.63; 95% CI: 1.15,6.00) higher odds of being LBW compared to neonates delivered from multiparous. Neonates born to mothers who were engaged in physically demanding work in the current pregnancy had 2.2 times higher probability of being LBW than that of neonates born from mothers who didn't engage in physically demanding work (AOR=2.20; 95% CI: 1.11,4.34). Mothers who had MUAC less than 23 cm were 2.7 times more likely to have LBW compared to mothers with MUAC greater than 22 cm (AOR=2.58; 95% CI: 1.29,5.18). The likelihood of having LBW among mothers who had encountered pregnancy-related complications during index pregnancy was 2 times higher (AOR=2.13; 95% CI:1.10,4.10) as compared to mothers without pregnancy-related complications. Furthermore, Neonates born from mothers who were exposed to IPV were 3.8 times (AOR=3.82; 95% CI: 1.83,7.98) more likely to be LBW as compared to neonates born from mothers who had not been exposed to IPV (Table 6).

Table 6 Bivariable and multivariable analyses of factors associated with LBW in Public Hospitals of North Shewa Zone, Oromia Region, central Ethiopia, June 15 to July 30, 2021.

Variables (n=441)	LBW		COR (95% CI)	AOR (95% CI)
	Yes (%)	No (%)		
Age				
≤20	24 (27.6)	63 (72.4)	2.68 (1.45, 4.78) *	2.39 (0.91, 6.30)
21-34	38 (12.5)	267 (87.5)	1	1
>34	16 (32.7)	33 (67.3)	3.41(1.71, 6.77) **	1.218 (0.48, 3.09)
Parity				
Primiparous	22 (17.1)	107 (82.9)	1.64 (0.89, 3.01)	0.77 (0.31, 1.99)
Multiparous	27(11.20)	215 (88.8)	1	1
Grandmultiparous	29 (41.4)	41 (58.6)	5.63 (3.03, 10.49) **	<b>2.63 (1.15, 6.00) *</b>
Gestational age				
Preterm	18 (36.0)	32 (64.0)	3.10 (1.64, 5.88) *	1.44 (0.64, 3.26)
Term	60 (15.3)	331(84.7)	1	1
Pregnancy complication				
Yes	41(38.3)	66 (61.70)	4.99(2.97, 8.37) **	<b>2.13 (1.10, 4.10) *</b>
No	37 (11.1)	297 (88.9)	1	1
Have you taken additional food during the current pregnancy				
Yes	29 (13.6)	185 (86.4)	1	1
No	49 (21.6)	178 (78.4)	1.76 (1.06,2.91) *	0.57 (0.30, 1.17)
Ever drunk alcohol during the current pregnancy				
Yes	59 (29.8)	139 (70.2)	5.00 (2.86, 8.75) **	1.14 (0.54, 2.40)
No	19 (7.8)	224 (92.2)	1	1
ANC follow up				
Yes	55 (15.1)	310 (84.9)	1	1
No	23 (30.3)	53 (69.7)	2.45(1.39, 4.31) *	1.70(0.82, 3.53)
Haemoglobin level				
<11g/dl	21 (46.7)	24 (53.3)	5.20 (2.72, 9.96) **	1.18 (0.51, 2.72)
≥11g/dl	57 (14.4)	339 (85.60)	1	1
Engaged in physically demanding work during the current pregnancy				
Yes	43 (37.1)	73 (62.9)	4.88 (2.92, 8.17) **	<b>2.19 (1.11, 4.34) *</b>
No	35 (10.8)	290 (89.2)	1	1
Exposed to intimate partner violence				
Yes	64 (34.2)	123 (65.8)	8.92 (4.81, 16.54) **	<b>3.82 (1.83, 7.98) *</b>
No	14 (5.5)	240 (94.5)	1	1
Food security status				
Secured	41(11.2)	324 (88.8)	1	1
In secured	37 (48.7)	39 (59.3)	7.50 (4.31, 13.06) **	<b>2.23 (1.08, 4.55) *</b>
MUAC measurement				
<23 cm	38 (48.1)	41 (51.9)	7.46 (4.31, 12.94) **	<b>2.58 (1.29, 5.18) *</b>
≥23 cm	40 (11.0)	322 (89.0)	1	1

\*Significant with p-value <0.05 and \*\*Significant with p-value <0.001

CI, Confidence Interval; COR, Crude Odd Ratio; AOR, Adjusted Odd Ratio; MUAC, mid-upper circumference; ANC, Antenatal Care.

## 5. DISCUSSION

The magnitude of LBW among newborns delivered in public hospitals of North Shewa zone was found to be 17.7% (95% CI:14.3, 21.5), which was relatively higher compared to the national figure. Pregnancy-related complications, food insecurity, parity, maternal MUAC, physically demanding work, and IPVP were significantly associated with LBW.

The overall proportion of LBW in this study was consistent with studies done in southern Ethiopia 18% (Alemu *et al.*, 2019), Dire Dawa city, eastern Ethiopia 21% (Sema *et al.*, 2019), Dessie town 15.6% (Jember Desalegn *et al.*, 2020), and Nepal 21.56% (DK Yadav *et al.*, 2011). However higher than studies conducted in Wolaita Sodo, southern Ethiopia 8.1% (Kastro *et al.*, 2018), Debre Tabor Hospital, northern Ethiopia 12.0% (Mekie and Taklual, 2019), Kenya 12.3% (Muchemi *et al.*, 2015), Ghana 10% (Mohammed *et al.*, 2019), Nepal 9.4% (Kandel and Kafle, 2017), India 13.8% (Ahankari *et al.*, 2017), and Iran 9.4% (Momeni *et al.*, 2017). This discrepancy may be attributed to differences in the study setting, study period, seasonal variation, and inclusion of private Hospitals in prior studies (Momeni *et al.*, 2017). Another possible explanation could be the difference in the proportion of mothers' neonates who received ANC in Debre Tabor Hospital and Wolaita Sodo health facility (91.5% and 91.7%, respectively), compared to the current study, which found that 82.0% of mothers received at least one ANC contact. Pregnant women who had ANC follow-up may receive improved disease screening and prevention, as well as better nutritional advice before giving birth.

The present proportion is, however lower than studies conducted in Dilla Town, Southern Ethiopia 34.1% (Mehare and Sharew, 2020), Uganda 25.5% (Louis *et al.*, 2016), Ghana 29.6% (Abubakari *et al.*, 2015), India 31% (Rajashree *et al.*, 2015), and Nepal 23.6% (Bansal *et al.*, 2018), This disparity might be due to differences in study time, and geographical variation and lower sample size compared to the current study (Rajashree *et al.*, 2015) (Bansal *et al.*, 2019; Louis *et al.*, 2016). Another possible reason is that most of the previous studies were carried out in referral hospitals; where many pregnant women were referred from outlying health facilities due to various difficulties.

In this study, mothers who were live in food-insecure households were more likely to have LBW babies than mothers living in food-secure households. This finding is supported by the study

conducted in Ethiopia, and Bangladesh, New York City (Sahlu *et al.*, 2020; Lemlem *et al.*, 2021; Grilo *et al.*, 2015; Chowdhury *et al.*, 2018). This may be due to mothers who were live in food-insecure households face shortage of food/or insufficient income on a long-term basis, resulting the mother to receive insufficient nutrients during her pregnancy, which are critical for the fetus' growth and development, especially in the second and third trimesters. Another reason is that inadequate nutritional intake during pregnancy as a result of food scarcity combined with poor maternal health (depressive symptom) leads to impaired placental growth, which reduces nutrient transfer from mother to fetus (Grilo *et al.*, 2015; Chowdhury *et al.*, 2018). Furthermore, food insecurity worsens diet quality among women of childbearing age, reduces micronutrient intake, and reduces energy consumption by 50% Therefore, intervention should be focused on mothers who live in food-insecure households (Ivers and Cullen, 2011).

In this study, neonates born to grand multiparous mothers had a higher probability of becoming LBW. This finding was supported by studies conducted in Ethiopia and California (Ratnasiri *et al.*, 2018; Alemu *et al.*, 2019). This could be explained by the fact that women with higher parities are more likely to give birth to LBW than women with lower parities because of shorter birth intervals, which impose excessive energy demands on the mother with no time for postpartum recovery and increasing parity may also associated with an increased risk of pregnancy complication (Acharya, 2014). Moreover, as the number of births increases, there is a high probability of having a large family, which could have an impact on the family's socioeconomic (Alemu *et al.*, 2019). These findings may supplement the use of proper family planning services to achieve adequate birth intervals and desired family size.

Mothers who had a pregnancy-related complication during their current pregnancy had a higher probability of having LBW than mothers who did not have a pregnancy complication. This finding is in line with previous studies done in Northern Ethiopia and Kenya (Muchemi *et al.*, 2015; Asmare *et al.*, 2018; Hailu and Kebede, 2018). This could be explained by the fact that mothers with pregnancy-related complications like; hypertension and APH were more likely to deliver LBW than mothers who did not encounter complications. This is because of pregnancy-related complication is associated with impaired placentation and uteroplacental perfusion (Cunningham *et al.*, 2014; Gemechu *et al.*, 2020). Therefore, it is suggested that

pregnant women should be informed of the risk indicators of pregnancy and the various causes of such issues; so that they may be diagnosed and treated as soon as possible.

In this study, the odds of becoming LBW was significantly increased among neonates born to mothers who were engaged in physically demanding work during their current pregnancy than neonates born to mothers who did not engage in physically demanding work. This finding is supported by finding from the studies done in Cairo, Nepal, and India (El-Moselhy *et al.*, 2012; Sharma *et al.*, 2015). This could be explained by the fact that an increase in the activity of the sympathetic nervous system in the active muscles following strenuous work causes blood to return from visceral arteries to active muscles, increased sweating, decreased plasma volume, fetal bradcardia and decrease uteroplacental blood flow, all of which reduce blood flow to the fetus (Rao *et al.*, 2003). Maternal physical activity during pregnancy may also influence infant's body composition, which may have a long-term impact on birth weight (Salvesen *et al.*, 2012). So that, health care providers should play an important role regarding decisions of work activity restriction and adequate rest during pregnancy.

This study revealed that mothers with MUAC less than 23cm were more likely to deliver LBW babies. This finding was comparable with the finding of studies conducted in Ethiopia and Kenya (Nyamasege *et al.*, 2019; Asmare *et al.*, 2018; Mingude *et al.*, 2020) where MUAC <23cm was a significant predictor of LBW. This is maybe supported by the fact that poor nutrition compromises the supply of nutrients to the developing fetus as newborns are ultimately dependent on mothers' nutritional status and placental feeding during pregnancy (Abu-Saad and Fraser, 2010). Therefore, it is important to ensure women have healthy diets, adequate services, rest, micronutrient supplementation and care is fundamental for the survival and well-being of mothers and their children.

In this study, the odds of having LBW was higher among mothers exposed to IPV than mothers who had not been exposed to IPV. This finding was consistent with the result of the studies done in Ethiopia, Bangladesh, and Tanzania (Khan *et al.*, 2020; Sigalla *et al.*, 2017; Alemu *et al.*, 2019). The possible justification is that prenatal exposure to IPV may impede mothers' healthcare-seeking behaviours, healthcare utilization, and decision-making in many areas of life. Another argument is that IPV is linked to persistent psychosocial stress and depression that leads to inadequate prenatal care, unhealthy behaviour (smoking, alcohol consumption, poor



diet) which increase the risk of LBW (Borders *et al.*, 2007). These findings may support to launch the WHO recommendations of healthcare providers should assess exposure to intimate partner violence when assessing other conditions that may be caused or complicated by IPVP to improve the subsequent care.

## **6. STRENGTH AND LIMITATION**

This multicenter study was conducted in four public hospitals of North Shewa zone and would have a better representation of the study participants and generalizability of the result. The study used primary data that was supplemented with medical record extraction, which will reduce the number of missing important factors. The study also attempted to identify additional relevant independent predictors of low birth weight, particularly factors that had not been addressed in previous investigations. However, this study also has some limitations, because of the nature of the study design it might not show a cause and effect relationship. Secondly, We used self-reporting (interview response) to assess some variables like intimate partner violence and food insecurity, which may have a social desirability bias. Another limitation of the study was, it may not be generalizable to the whole population of the catchment area, since it was restricted to neonates delivered at health facilities, which excluded home births.

## **7. CONCLUSION AND RECOMMENDATIONS**

### **7.1. Conclusion**

Low birth weight newborns were born to almost two out of every ten mothers who gave birth in the Public Hospitals of the North Shewa zone. Physically demanding work during pregnancy, food insecurity, intimate partner violence, grand multiparity, MUAC less than 23 centimetres, and pregnancy-related complications during the current pregnancy were significantly associated with LBW. Therefore, screening and putting in place appropriate prevention strategies for high-risk mother's is important.

## **7.2. Recommendations**

Based on the study finding the following recommendations are forwarded:

### **To North Shewa Zonal and woreda health offices**

- ✓ To work with the concerned stakeholder on comprehensive intervention strategies to help women with food insecurity and to improve the living standard and lifestyles of mothers
- ✓ The zonal health bureau to give training for health care practitioners on how to screen, counsel, treat, and follow up with women who have been exposed to intimate partner violence.
- ✓ To reduce the prevalence of LBW all stakeholders working on maternal and child health should focus on the identified factors.

### **To health professionals of the Hospitals**

- ✓ To work in collaboration with health extension workers to provide education to pregnant women on the impact of hard or strenuous physical work on birth weight and the importance of adequate rest during pregnancy.
- ✓ Health care practitioners to screen pregnant women for undernutrition and counsel them about a healthy diet throughout pregnancy.
- ✓ To counsel pregnant women to limit work related physical demanding during pregnancy
- ✓ Strengthening the integration of nutrition counseling in to ANC could help to improve maternal nutritional status during pregnancy
- ✓ To provide special attention to risk pregnancy like PIH, APH, severe nausea and vomiting, grand multiparity and offer appropriate and on-time interventions accordingly.

### **To other researchers**

- ✓ Do further investigation to identify other factors like the effect of maternal weight gain during pregnancy on LBW by using a longitudinal study design.

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## 9. ANNEXES

### 9.1. Information sheet and informed voluntary consent form

#### 9.1.1. For hospital administrator

**Introduction:** good morning/afternoon? My name is Elias Yadeta I am working as a principal investigator of the study being conducted in this hospital. I am an MS.c student at Haramaya University, College of Health and Medical Sciences in the department of Maternity and Neonatal Nursing. I kindly request you to lend me your attention to explain to you about the study and being selected as the study participant.

**The study/project title:** prevalence of LBW and associated factor among newborns delivered in public hospitals of North Shoa Zone, Oromia regional state, Central Ethiopia, 2021.

**Purpose/Aim of the study:** The findings of this study can be of paramount importance for health care planners and managers. Moreover, this study aims to write a thesis as a partial requirement for the fulfilment of a Master's Program in Maternity and Neonatal Nursing for the principal investigator.

**Procedure and duration:** The data collectors will be interviewing a woman who gave birth in the public Hospital of the study area using a questionnaire to provide the pertinent data that is helpful for the study. There are 79 questions to answer where a data collector will fill the questionnaire if the participants are agreeing to involve the interview it will take a maximum of 30-35 minutes.

**Risks and benefits:** The risk of being participating 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 the local health planners.

**Confidentiality:** The information they will provide us will be kept confidentially. There will be no information that will identify the participants in particular. The findings of the study will be general for the study Community and will not reflect anything particular of individual persons. 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.

**Rights:** Participation in this study is fully voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits to which they otherwise are entitled. they do not have to answer any question that they do not want to answer.

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

Principal Investigator: Mr Elias Yadeta Email -: [eliasyadeta262@gmail.com](mailto:eliasyadeta262@gmail.com)

Phone number-: 0924899107, Institutional Health Research Ethics Review Committee; Office phone: +251-0254-66-2011 or P.O. Box 235, Ethiopia

**Declaration of informed voluntary consent:** I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. The participants have been allowed to ask questions about things that may have been unclear. I was informed that the participant has the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the Hospital administration has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the institution premises. Therefore, I declare my voluntary consent to permit this study to be conducted in this institution with my signature as indicated below.

Name and signature of Head of institution \_\_\_\_\_ Date \_\_\_\_\_

Name and signature of Data Collector: \_\_\_\_\_ Date \_\_\_\_\_

**Thank you for your cooperation!!**

### **9.1.2 English Version of Information Sheet and Informed Voluntary Consent Form for Participants Aged 18 and above.**

My name is \_\_\_\_\_ I am working as a data collector for the study being conducted in this Hospital by **Mr Elias Yadeta** who is studying for his Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain to you about the study and being selected as the study participant.

**1. The study/project title:** Magnitude of LBW and associated factor among newborns delivered in public hospitals of North Shoa Zone, Oromia regional state, Central Ethiopia, 2021.

**2. Purpose/aim of the study:** The findings of this study can be of paramount importance for health care planners and managers. Moreover, this study aims to write a thesis as a partial requirement for the fulfilment of a Master's Program in Maternity and Neonatal Nursing for the principal investigator.

**3. Procedure and duration:** The data collectors will be interviewing a woman who gave birth in the public Hospital of the study area using a questionnaire to provide the pertinent data that is helpful for the study. There are 79 questions to answer where a data collector will fill the questionnaire if the participants are agreeing to involve the interview it will take a maximum of 30-35 minutes.

**4. Risks and benefits:** The risk of being participating 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 the local health planners.

**5. Confidentiality:** The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study population and will not reflect anything particular of individual persons. 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.

**6. Rights:** Participation in this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw

from the study at any time and this will not label you for any loss of benefits to which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

**7. Contact address:** If there are any questions or enquires any time about the study or the procedures, please contact Principal Investigator: **Elias Yadeta**, at mobile phone: +251924899107 as well as the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University College of Health and Medical Sciences at the office phone 0254662011 or P.O. Box 235, Harar, Ethiopia.

**8. Declaration of informed voluntary consent:** The participant information sheet is read to me. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating, and the contact address for any queries. I have been allowed to ask questions about things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any a question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature).

Name and signature of participant: \_\_\_\_\_ Date \_\_\_\_\_

Name and signature of Data Collector: \_\_\_\_\_ Date \_\_\_\_\_

**9.1.3 English Version of Information Sheet and Informed Voluntary Consent Form for participant Aged < 18 Years to Be Signed by Her Legal Competent Representative (Parent/Guardian).**

My name is \_\_\_\_\_ I am working as a data collector for the study being conducted in this Hospital by **Mr Elias Yadeta** who is studying for his Master's degree at Haramaya University, the College of Health and Medical Sciences. I kindly request you to lend me your attention to explain to you about the study and being selected as the study participant.

**1. The study/project title:** prevalence of LBW and associated factor among newborns delivered in public hospitals of North Shoa Zone, Oromia regional state, Central Ethiopia, 2021.

**2. Purpose/aim of the study:** The findings of this study can be of paramount importance for health care planners and managers. Moreover, this study aims to write a thesis as a partial requirement for the fulfilment of a Master's Program in Maternity and Neonatal Nursing for the principal investigator.

**3. Procedure and duration:** I will be interviewing your wife/daughter using a questionnaire to provide me with pertinent data that is helpful for the study. There are 79 questions to answer where a data collector will fill the questionnaire if the participants are agreeing to involve the interview it will take a maximum of 30-35 minutes. so, I kindly request you to spare me this time for the interview.

**4. Risks and benefits:** The risk of being participating 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 the local health planners.

**5. Confidentiality:** The information that we will be collected for this study will be confidential. There will be no information that will identify your wife/daughter or yourself in particular. The findings of the study will be general for the study population and will not reflect anything particular of individual persons. 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.

**6. Rights:** Participation in this study is fully voluntary. You have the right to declare to allow your wife/daughter to be involved in this study or not. If you would allow your wife/daughter for this study, you have the right to withdraw her from the study at any time and this will not label you/your wife/daughter for any loss of benefits which you/your wife/daughter otherwise are entitled. You do not have to answer any question that you do not as well.

**7. Contact address:** If there are any questions or enquires any time about the study or the procedures, please contact Principal Investigator: **Elias Yadeta**, at mobile phone: +251924899107 as well as the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University College of Health and Medical Sciences at the office phone 0254662011 or P.O. Box 235, Harar, Ethiopia.

**9. Declaration of informed voluntary consent:** I have read/ was read to me/ information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been allowed to ask questions for things that may have been unclear. I was informed that I have the right to withdraw my wife/daughter from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to allow my wife/daughter to participate (be involved) in this study with my initials (signature).

Name and Signature of parent/guardian of mother: \_\_\_\_\_ Date \_\_\_\_\_.



Name and signature of Data Collector: \_\_\_\_\_ Date: \_\_\_\_\_.

## 9.2. Instruments for data collection

### 9.2.1. English version questionnaires

<b>Part I: socio-demographic characteristics of the respondents</b>			
	Name of the hospital	_____	
	Date of interview	____ ____ ____ DD  MM  YYYY	
	Characteristics	Response	Skip
	Participant code	_____	
101	Age of the mother (in completed years)	_____	
102	Religion	<ol style="list-style-type: none"> <li>1. Orthodox</li> <li>2. Muslim</li> <li>3. Protestant</li> <li>4. Catholic</li> <li>5. If others specify -----</li> </ol>	
103	Marital status	<ol style="list-style-type: none"> <li>1. married/living together</li> <li>2. divorced/separated</li> <li>3. widowed</li> <li>4. single/never married</li> </ol>	
104	Place of residence	<ol style="list-style-type: none"> <li>1. urban</li> <li>2. rural</li> </ol>	
105	Educational status of the mother	<ol style="list-style-type: none"> <li>1. Unable to read and write</li> <li>2. Primary education (1-8)</li> <li>3. Secondary education (9-12)</li> <li>4. Tertiary (college and above)</li> </ol>	
106	Occupation status of the mother	<ol style="list-style-type: none"> <li>1. Student</li> <li>2. Housewife</li> <li>3. Private employed</li> <li>4. Government employed</li> <li>5. Merchant</li> <li>6. If others specify -----</li> </ol>	
107	Average monthly income of the family(cash)	-----	
108	Educational status of husband/partner	<ol style="list-style-type: none"> <li>1. Unable to read and write</li> <li>2. Primary education (1-8)</li> <li>3. Secondary education (9-12)</li> <li>4. Tertiary (college and above)</li> </ol>	
109	Occupation of husband/partner	<ol style="list-style-type: none"> <li>1. Student</li> <li>2. Private employed</li> <li>3. Government employed</li> <li>4. Merchant</li> <li>5. Farmer</li> <li>6. If others specify -----</li> </ol>	
110	Your household family size	Number_____	
<b>Part II: obstetrics and reproductive related variables</b>			
201	The total number of pregnancies (gravida)?	Gravida: _____	



202	The total number of births (parity)?	Parity: _____	
203	The pregnancy was?	1. Panned and wanted 2. Unplanned but wanted 3. Unplanned and unwanted	
204	The birth interval between this pregnancy and immediate previous pregnancy?	1. <24 months 2. <24-48 months 3. >48 months	
205	Have you ever had an abortion?	1. Yes 2. No 	207
206	The total number of abortions?	Number: _____	
207	Did you have any history of pre-term delivery ( $\leq 37$ wk)?	1. Yes 2. No	
208	Have you ever used family planning	1. Yes 2. No	
<b>Part III: Maternal medical factors</b>			
	<b>Characteristic</b>	<b>Answer</b>	<b>skip</b>
301	Did you face pregnancy complications in the last pregnancy	1. Yes 2. No	
302	If yes which one of the following	1. Antepartum haemorrhage 2. Premature of the rapture of membrane 3. pregnancy-induced Hypertension 4. Nausea and vomiting 5. If other -----	
303	Do you have a history of Diabetes mellitus?	1. Yes 2. No	
304	During your current pregnancy, have you been told that you have developed gestational diabetes mellitus?	1. Yes 2. No	
305	During this pregnancy, did you take Iron tablets?	1. Yes 2. No 	311
306	During the whole pregnancy, for how many days did you take the Iron tablets?	No of Days: _____	
307	During your current pregnancy, have you been told that you have anaemia?	1. Yes 2. No	
308	Do you have any chronic medical illnesses?	1. Yes 2. No	
309	If yes Which chronic medical illness, do you have? (more than one response is possible)	1. Chronic hypertension 2. Diabetes mellitus 3. Heart Disease 4. kidney Disease 5. Others (Specify) _____	
<b>Part IV; Maternal nutritional status</b>			
401	Have you got nutritional counselling during your current pregnancy?	1. Yes 2. No	
402	What was your meal frequency within a day before this pregnancy?	_____ times	
403	Have you taken additional meals during your current pregnancy?	1. Yes 2. No	

404	What was your meal frequency within a day during your current pregnancy?	1. Once 2. Twice 3. Thrice 4. Four times and above	
405	Did you fast during your last pregnancy?	1. Yes 2. No	
406	Is there any food item that you avoided after you became pregnant	1. Yes 2. No	
407	In your recent pregnancy Have you ever used alcoholic beverages (wine, beer, areke, tela, etc.)?	1. Yes 2. No	
408	How often were you taking alcoholic drinks?	1. Always 2. Usually 3. Some time	
409	During your pregnancy, did you chew chat?	1. Yes 2. No	
410	If yes to Q 409 How often were you chewing khat	1. Always 2. Usually 3. Some time	
411	During your current pregnancy, did Have you ever Smoke?	1. Yes 2. No	
412	If yes to 4011, how often were you smoking?	1. Always 2. Usually 3. Some time	
413	Have you ever taken herbal medicine during your current pregnancy?	1. Yes 2. No	
414	Did your partner ever Smoke?	1. Yes 2. No	
	<b>Part VII; Regarding food insecurity condition</b>		
	In the past four weeks.....		
415	Did you or any household member worry that your household would not have enough food?	1. Yes 2. No	
416	Were you or any household member not able to eat the kinds of foods you/he/she preferred because of a lack of resources?	1. Yes 2. No	
417	Did you or any household member have to eat a limited variety of foods due to a lack of resources?	1. Yes 2. No	
418	Did you or any household member have to eat some foods that you did not want to eat because of a lack of resources to obtain other types of food?	1. Yes 2. No	
419	Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1. Yes 2. No	
420	did you or any household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No	
421	was there ever no food to eat of any kind in your household because of lack of resources to get food?	1. Yes 2. No	
422	did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No	

423	did you or any household member go a whole day and night without eating anything because there was not enough food?	1. Yes 2. No	
<b>Part V; Regarding physical work during pregnancy</b>			
501	During your current pregnancy which physical work have you ever experienced?	Answer	
		1=Yes	2= No
	1. Daily household chores		
	2. Fetching water with large buckets out of compounds		
	3. Lifting heavy loads (>20kg)		
	4. Chopping woods, cutting grass for cattle feeding		
	5. Washing clothes/utensils for long		
	6. Milking cattle		
	7. Digging potatoes		
	8. Planting seeds		
	9. Removing bran from cereals by pounding		
	10. Standing for longer hours (>3hrs)		
	11. Squatting during routine daily activity		
502	How long does it take to reach the health facility?	1. Less than 1 hour 2. greater than 1 hour	
503	How long time did you take for rest during pregnancy per day?	1. <2 hr. 2. >2 hr.	
<b>Part VI; Regarding intimate partner violence during pregnancy</b>			
	During your current pregnancy had your husband/intimate partner ever...		
601	Slapped or had something thrown at you that could hurt you?	1. Yes 2. No	
602	Pushed or shoved you?	1. Yes 2. No	
603	Hit with a fist or something else that could hurt you?	1. Yes 2. No	
604	Beaten your abdomen?	1. Yes 2. No	
605	Choked or burnt you on purpose?	1. Yes 2. No	
606	Threatened to use or used a gun, knife, or another weapon against you?	1. Yes 2. No	
	<b>Sexual violence</b>		
	During your current pregnancy had your husband/intimate partner ever.....		
607	Physically forced to have sexual intercourse when you did not want to?	1. Yes 2. No	
608	Had sexual intercourse when you did not want, because you were afraid of what your partner might do to you?	1. Yes 2. No	
609	Forced you to do something sexual that you found degrading or humiliating?	1. Yes 2. No	

	<b>Emotional/psychological violence</b> During your current pregnancy had your husband /intimate partner ever.....		
610	Insulted or made you feel bad about yourself?	1. Yes 2. No	
611	Belittled or humiliated in front of other people?	1. Yes 2. No	
612	Had done things to scare or intimidate her on purpose (e.g., by yelling or Smashing things)?	1. Yes 2. No	
613	Had threatened to hurt her or someone you cared about?	1. Yes 2. No	
<b>Part VI: Extraction checklist from medical charts</b>			
701	Have you ever attended ANC follow up for your current delivery?	1. Yes 2. No	
702	If yes to Q 701 how many times?	1. 4 visits and above 2. less than 4 visits	
703	At what months of the current pregnancy, you started ANC?	1. _____in weeks 2. Don't know/not sure	
704	How did you give birth? <b>That is a mode of delivery</b>	1. Vaginal delivery 2. Assisted delivery 3. Cesarean section	
705	Type of pregnancy	1. Singleton birth 2. multiple births	
706	What was her haemoglobin level on? her current pregnancy?	1. -----g/dl	
707	HIV status of the mother (PICT)	1. Reactive 2. Non-reactive 3. Don't know	
<b>Part VII: newborn characteristic from records</b>			
801	Neonatal birth weight in grams?	In gm: _____	
802	Sex of the newborn?	1. Male 2. Female	
803	Gestational age (GA) at Delivery	_____wks.	
<b>Measurement</b>			
804	MUAC (Take left hand if righthanded, and right hand if left-handed)	1. _____cm	

### **9.3. Afan Oromo Version of Information Sheet and Informed Voluntary Consent Form for Participants Aged 18 and Above.**

#### **kutaa I: Guca Odefannoo**

**Seensa:** Akkam buultan/ooltan ani maqaan Koo obbo \_\_\_\_\_ Jedhama.

Sababiin ani iddoo kanatti argamuu danda'eef qorannoo obbo Elias Yadeta Barataa University Haramaya kan tahe Mummee "Maternity and Neonatal Nursing" dhaan digrii lammaffaa isaa Xumuruuf raga Qorannof tahuu funaanaa jira. Kanaafuu oddefanno sirii ta'ee akkaa nuf kennitanii fi akkasumas qorannoo kana kessatti hirmachuu kessaaniif gudda issiin galatefanna.

**Mata duree qorannoo:** -dhibbentaa (prevalence) fi rakkowwaan ulfaatina daa'ima reefu dhalattuu, akka haga barbaaddamu gadi xiqqaatu (2.5kg gadii) tasisaan irraatti Hospitaalota Godina shawaa Kaabaa, Naannoo Oromiyaa, giddu galeessaa Ethiyoopiyatti qoraatamuf deemudha.

**Kaayyoo Qorannicha:** - Bu'aan qorannoo kana irraa argamu Qaama karora fayyaa waligalaa kessattu fayyaa Hadholii irra hojjetaan, hogganani fi, Akkasumas gaggesitota fayyaa Sadarkaa Godina, Hospitalarratti fi bufataa fayyaa irraa jiraanif rakkowaan Ulfaatina Daa'ima reefu dhalattuu akka xiqqatuu godhan irraatii oddefanno sirii ta'ee funaanudhaan karoraa bafachuufi hawasni tajajjila akkamiitiif dhabbilee fayyaa filachuu akkaa qaban kan addaan baffatanii akka irraatti hojjetan ni gargaara.

**Adeemsa fi yeroo:** - Gaaffiiwwan qorannoof ta'uu danda'an kun si'ii fi maatii kee Kan ilaallatu waan ta'eef bifa gaffi fi deebiittin Kan qopha'ee dha. Gaaffiiwwan kun lakkofsan 79 yemuu ta'aan daqiiqaa 30-35 caalaa hin fudhatan, Kanafuu sirritti ergaa dhageftanii booda waan itti amantaniifi sirriidha jettan akka deebiftaan kabajadhaan isin gafadha.

**Miidhaa fi fayidaa:** - Qorannoo kana irratti hirmaachuu keessaniin miidhaan issin irra gahu baay'ee xiqadha innis, yeroo gabaabdu issin jalaa fudhatudha. Qorannoo kana kessatti hirmachudhaan mallaqni isini kaffalamu hin jiru garuu bu'aan qorannoo kana hawassaa Godina keessaanitiif bu'aa gudda qaba.

**Iciitii;** - Odeeffannoon isin nuuf kennitan kun iccitidhaan Kan eggamuudha. Oddeffannoo isin nuuf kennitaan kamiyyuu qaama biroof hin saxilamu. Bu'aan qorannoo kana namotaa qo'annoo kana kessatti hirmataan qofaaf ossoo hin tanee namotaa qorannoon kun ilaallatu hundaaf ola. gabaasni barrefamanis ta'e afaanin hirmaattota qo'annoo kana kessatti isin saaxilu hin jiratu.

**Mirga;** -Qorannoo kana kessatti hirmaachuun gutummatti fedhirraati kan hunda'eedha. Hirmachuufi hirmachuu dhisuun mirga hirmattotati. Yeroo barbaddeetti hirmaannaa kee addaan kutuu dandesaa. Kuun immoo miidhaan sinirraan gahuu hin jiru

**Karaa itti qunnamuu dandeessaan-**: Waa'ee qorannichaa irratti waan gaaffii ta'an hundda ykn waan isin yaaddessu yoo jiraate teessoo armaan gadii kanaan yeroo barbaaddanitti nu arggachu dandeessu. Maqaa Abbaa qorannoo: -Eliyaas Yaadataa

Email -: [eliasyadeta262@gmail.com](mailto:eliasyadeta262@gmail.com)

Lakk. Bilbila Mobila-: 0924899107 Univaarsiitii Haramayaa

**Formii hayyamaa fi Walii galtee:** -Waa'een Qorannoo fi mirgi hirmaattuu erga naaf dubbifame booda kaayyoo qorannoo, bu'aa qoranna, miidhaan qorannoon kun qabu, haalli eegumsa iciiti, mirgi hirmaachuu fi hirmachu dhiisuu Haalan naaf ibsameet jira. Gaaffii yoon qabaadhe gaafachuuf carraan naaf kenname jira, gidduttis dhiisuu yoon barbaade yeroon barbaadetti hirmaachu dhiisu akka danda'u fi gatii tokkollee deebisuun Kan hin barbaachifne ta'uun mirga guutu akkaan qabu ergaan hubadhee booda fedhii guutuun qorannoo kana irratti hirmaachuuf kaniin murtesse ta'uu kiyya maqaa fi Mallattoo kiyyaanin mirkaneessa.

Maqaa fi Mallattoo odeffanno kennaa; \_\_\_\_\_  
Guyyaa\_\_\_\_\_.

Maqaa fi mallattoo odefannoo sassaabaa: \_\_\_\_\_Guyyaa\_\_\_\_\_.

#### **9.4. Afan Oromo Version of Information Sheet and Informed Voluntary Consent Form for Mothers of Neonates (Age < 18 Years) to Be Signed by Her Legal Competent Representative (Parent/Guardian).**

##### **kutaa I: Guca Odefannoo**

**Seensa:** Akkam buultan/ooltan ani maqaan Koo obbo \_\_\_\_\_ Jedhama. Sababiin ani iddoo kanatti argamuu danda'eef qorannoo obbo Elias Yadeta Barataa University Haramaya kan tahe Mumme "Maternity and Neonatal Nursing" dhaan digrii lammaffaa isaa Xumuruuf raga funaanaa jira. Kanaafuu oddefanno sirii ta'ee akka nuf kennitanii fi akkasumas qorannoo kana kessatti hirmachuu kessaaniif gudda issiin galatefanna.

**Mata duree qorannoo:** -dhibbentaa (prevalence) fi rakkowwaan ulfaatina daa'ima reefu dhalattuu, akka haga barbaaddamu gadi xiqqaatu (2.5kg gadii) tasisaan irraatti Hospitaalota Godina shawaa Kaabaa, Naannoo Oromiyaa, giddu galeessaa Ethiyoopiyatti qoraatamuf deemudha.

**Kaayyoo Qorannicha:** - Bu'aan qorannoo kana irraa argamu Qaama karora fayyaa waligalaa kessattu fayyaa Hadholii irra hojjetaan, hogganani fi, Akkasumas gaggisitota fayyaa Sadarkaa Godina, Hospitalarratti fi bufataa fayyaa irraa jiraanif rakkowaan Ulfaatina Daa'ima reefu dhalattuu akka xiqqatuu godhan irraatii oddefanno sirii ta'ee funaanudhaan karoraa bafachuufi hawasni tajajjila akkamiitiif dhabbiilee fayyaa filachuu akka qaban kan addaan bafatanii akka irraatti hojjetan ni gargaara.

**Adeemsa fi yeroo:** - Gaaffiiwwan qorannoof ta'uu danda'an kun si'ii fi matti kee Kan ilaallatu waan ta'eef bifa gaffi fi deebiitin Kan qopha'e dha. Gaaffiiwwan kun lakkofsan 79 yemuu ta'aan daqiqaa 30-35 caalaa hin fudhatan, Kanafuu sirritti ergaa dhageftanii booda waan itti amananiifi sirriidha jedhaan akka deebisaan kabajadhaan isaan gafanna.

**Miidhaa fi fayidaa:** - Qorannoo kana irratti haati mana ykn intallii keessaan hirmaachuun fi odeffannoo kennuun miidhaan irra ga'u baay'ee xiqadha. innis, yeroo gabaabdu jalaa kan fudhatudha. Qorannoo kana kessatti hirmachudhaan mallaqni isheef kaffalamu hin jiru garuu bu'aan qorannoo kana hawassaa Godina keessaanitiif bu'aa gudda qaba.

**Icitiin:** - Odeeffannoon qorannoo kanaaf funaanamu hunduu iccitiin isaa Kan eegamuu dha. Namoonni odeeffannoo kana kennitan maqaan keessan/kan haadha manaa/daa'ima keessanii hin barreeffamu, garuu mallattoo/lakkoofsi addaa Kan isinii kennamu ta'uusaa isiniif ibsuu

barbaadaa. Itti dabaluu odeeffannoo kana Nama qorannoo kana adeemsisuun ala namni kammiyyuu akka hin-argine ni godhama.

**Mirga;** -Qorannoo kana kessatti hirmaachuun gutummatti fedhirraati kan hunda'eedha. Hirmachuufi hirmachuu dhisuun mirga hirmattotati. Yeroo barbaddeetti hirmaannaa ishee addaan

kutuu dandessii. Kuun immoo miidhaan ishirraan gahuu hin jiru

**Karaa ittii nu qunnamuu dandeessaan-**: Waa'ee qorannichaa irratti waan gaaffii ta'an hundda ykn waan isin yaadessu yoo jiraate teessoo armaan gadii kanaan yeroo barbaaddanitti nu arggachu dandeessu. Maqaa Abbaa qorannoo: -Eliyaas Yaadataa

Email -: [eliasyadeta262@gmail.com](mailto:eliasyadeta262@gmail.com)

Lakk. Bilbila Mobila-: 0924899107 Univaarsiitii Haramayaa

**Formii hayyamaa fi Walii galtee:** -Waa'een Qorannoo fi mirgi hirmaattotaa erga naaf dubbifame booda kaayyoo qorannoo, bu'aa qoranna, miidhaan qorannoon kun qabu, haalli eegumsa iciiti, mirgi hirmaachuu fi hirmachu dhiisuu Haalan naaf ibsameet jira. Gaaffii yoon qabaadhe gaafachuuf carraan naaf kenname jira, gidduttis dhiisuu yoon barbaade yeroon barbaadetti hirmaachu dhiisu akka danda'u fi gatii tokkollee deebisuun Kan hin barbaachifne ta'uun mirga guutu akkaan qabu ergaan hubadhee booda fedhii guutuun qorannoo kana irratti hirmaachuuf kaniin murtesse ta'uu kiyya maqaa fi Mallattoo kiyyaanin mirkaneessa.

Maqaa fi Mallattoo Maatii Hirmattuu; \_\_\_\_\_ Guyyaa\_\_\_\_\_.




Maqaa fi mallattoo odefannoo sassaabaa: \_\_\_\_\_ Guyyaa\_\_\_\_\_.



### 9.4.1. Afaan Oromo version questionnaires

#### Kutaa 1: Gaafannoo Haala qabatamaa hawaas-dinaagdee

Kutaa 1: Gaafannoo Haala qabatamaa hawaas-dinaagdee			
	Maqaa Hospitaala	_____	
	Guyyaa gaffiin kun gafatamee	Guyya Baati Bara	
	Gaafannoo	Deebii	Irra darbi
101	Umurinkee Meeqa? (waggaadhan)	_____	
102	Amantaan kee maali?	1. Ortodoksii 2. Muslimaa 3. Protestanti 4. Catholic 5. Kan biraa yoo jiraate ibsi----- -----	
103	Haala ga'eelaa	1. Kan herumtee 2. Kan adda baatee 3. Kan irraa du'e 4. Kan hin heruumn	
104	Sadarkaa barnootaa kan Haadhaa	1. Kan barreessu fi dubbisuu hin Dandeenyee 2. sadarkaa jalqabaa kan xumurtee (1-8) 3. sadarkaa lammaffaa kan xumurte (9-12) 4. Koollejii fi isaa ol	
105	Gita hojii kan haadha manaa	1. Barattuu 2. haadha manaa 3. Hojettuu dhuunfaa 4. Hojettuu motummaa 5. Daldaltuu 6. Kan biroo _____	
106	Galii matii Kan ji'aa gidduu galessaan	1. Qarshiin_____	
107	Sadarkaa barnootaa kan abba manaa	1. Kan barreessu fi dubbisuu hin dandeenyee 2. Sadarkaa jalqabaa kan xumure (1-8) 3. Sadarkaa lammaffaa kan xumure (9-12) 4. Koollejii fi isaa ol	
108	Gita hojii kan abbaa manaa	1. Barataa 2. Hojjetaa dhuunfaa 3. Hojjetaa motummaa 4. Daldaalaa 5. Qonnaan bulaa 6. kan broo _____	
109	Bay'ina maatii kessanii	lakkofsan_____	
Kutaa 2: Haala mirga fayyaa walhooramataa ilaalchisee			
201	Yeroo meeqaaf garattii baatee (kan ammaa Dabalatee)	Lakk_____	
202	Dahumsi ammaa kun meeqaafadha	Lakk: _____ffaa	

203	Hallii ulfa amma kun maal fakkaata	<ol style="list-style-type: none"> <li>1. Kan karoorfamee fi kan barbaddamu</li> <li>2. Kani hin karoorfamne garu kan barbaddamu</li> <li>3. Kan itti hin karoorfame fi kan hinbarbaddamne</li> </ol>	
204	Ulfi ammaa kuunifi kan duraa hagaam walirraa fagaata (kan amma kun si'a lammaffa fi isa ol warraa ta'ef)	<ol style="list-style-type: none"> <li>1. Baatii 24 fi isa gadi</li> <li>2. Baatii 24-47 gidduu</li> <li>3. Baati 48 fi isaa ol</li> </ol>	
205	Kana duraa ulfii sirraa bahee beekaa?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii </li> </ol>	401
206	Bay'ina ulfa sirraa bahee?	Lakk: _____	
207	Kana duraa otoo baati sagal hin xummiriin deessee beektaa?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
208	Qusanna maati fayyadamtee beektaa?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
<b>Kutaa 3: Fayyummaa hadhoolii ilaalchise gaffilee gafataman</b>			
<b>Gaaffilee Gafataman</b>		<b>Deebii</b>	
301	Yeroo ulfa isa amma kanattii Rakkoleen yeroo uulfaa Hadhoolii mudachuu danda'an isin mudateeraa	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii </li> </ol>	307
302	Rakkoleen yeroo uulfaa Hadhoolii mudachuu dandahan keessaa kamtu isni mudate?	<ol style="list-style-type: none"> <li>1. Da'umsan duraa dhignii jiguu</li> <li>2. Cininsuun duraa garbii mucaa jiguu</li> <li>3. dhibbaa dhiigaa olka'ee sababa ulfaan walqabatee</li> <li>4. Infeekshinii affuffee fincaanii</li> <li>5. Hoqqisiisuu</li> <li>6. Kan biraa yoo jirate _____</li> </ol>	
303	Dhukkuba sukkaaraa qabdaa jedhamtee beektaa?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
304	Yeroo Ulfa isa amma kana dhukkuba sukkaaraa qabda jedhamteertaa?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
305	Yeroo ulfa isa ammaa kanattii dawaan hir'inaa dhiigaf (folic Acid) kennamuu fudhattani ykn bitattanii jirtuu?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii </li> <li>3. Hhin yaadadhuu</li> </ol>	416
306	Yeroo Hagamiif dawaan hir'ina dhiigaa kana fudhattani?	1. Guyyaan: _____	
307	Yeroo ulfaa isa ammaa kana Hir'ina dhiiga qabdaa jedhamtanirtuu?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
308	Dhukkuboota yeroo dheraaf nama wal in turuu danda'aniin qabamtanirtuu?	<ol style="list-style-type: none"> <li>1. Eyyee</li> <li>2. Lakkii</li> </ol>	
309	deebin keessan gaaffii 312f eyyee yoo ta'ee dhukkuba isa kam qabduu?	<ol style="list-style-type: none"> <li>1. Dhukkuba dhiibbaa dhiigaa olkahee</li> <li>2. Dhukkuba sukkaaraa</li> <li>3. Dhukkuba onneee</li> <li>4. Dhukkuba kalee</li> <li>5. Kan biro: _____</li> </ol>	
<b>Kutaa 4; Gaaffilee Haala Soorrataa ilaalchisee Gafataman</b>			

401	Yeroo ulfa isa ammaa kana Gorsii haala nyaata yeroo uulfaa ilaalchisee isiiniif laattameeraa	1. Eyyee 2. Lakkii	
402	Yeroo ulfa isa ammaa kana nyataa dabalataa fudhattanirtuu?	1. Eyyee 2. Lakkii	
403	Ulfa isa amma kana dura guyyaatti si'a meeqaa nyaata nyaattuu?	1. Yeroo: _____	
404	Yeroo ulfa isa amma kana guyyaatti si'a meeqa nyaata nyaattuu?	1. Yeroo tokko 2. Yeroo lama 3. Yeroo sadii 4. Yeroo afurifii isa ol	
405	Yeroo garaadhaa qabdutti ni soomantaa?	1. Eyyee 2. Lakkii	
406	Ergaa ulfooftee booda gosti nyaata ati dhiistee ykn si jibbisisee ni jiraa?	1. Eyyee 2. Lakkii	
407	Yeroo ulfa isa amma kana dhuugaati nama macheessuu danda'aan(alkoolii) fayyadamtaniirtuu?	1. Eyyee 2. Lakkii	
408	Yeroo hagamiif dhugaati alkoolii qaban kana fayyadamtan:	1. Yeroo hunda 2. Yeroo baayyeee 3. Yarbe darbee	
409	Yeroo ulfa isa amma kana caatii ni qaamtu turee?	1. Eyyee 2. Lakkii	
410	Yeroo hagamiif qamaatu?	1. Yeroo hunda 2. Yeroo baayyeee 3. Darbe darbee	
411	Yeroo ulfa isa amma kana sigaaraa ni aarsitu turee?	1. Eyyee 2. Lakkii	
412	Yeroo hagamiif sigaaraa aarsitu?	1. Yeroo hunda 2. Yeroo baayyeee 3. Darbe darbee	
413	Yeroo ulfa isa amma kana qoricha aadaa fayyadamtertaa?	1. Eyyee 2. Lakkii	
414	Abban manakee ykn Hiriyaan kee Sigaaraa ni xuuxaa?	1. Eyyee 2. Lakkii	
	<b>Food insecurity/ Rakkina nyaataa</b>		
	Torbeewwan afran darban keessa.....		
415	Mana kessaattii nyaanni gahaan hin jiru jettanii yaddoftanii bektuu?	1. Eyyee 2. Lakkii	
416	sababa hanqina qabeenyatiif isin ykn maati keessaa namni wan filate otoo hin nyaatin hafe jiraa?	1. Eyyee 2. Lakkii	
417	Isin ykn miseensi maatii keessan dhabuu irra kan ka'e nyaata akaaku/gosa murtaa'e qofa soorachuu isin muudateera?	1. Eyyee 2. Lakkii	
418	Isin ykn miseensa maati keessaa dhabuu irra kan ka'e nyaata ati jaalattu (feetu) soorachu dhabuun sin qunnamee beeka?	1. Eyyee 2. Lakkii	
419	Sababa nyaata gahaa hin qabneef isin yk maatin keessan nyaata xiqqaa hanga barbaaddaan gadi nyaattaan turee?	1. Eyyee 2. Lakkii	
420	Isin ykn miseensa maatii keessan mana keessatti dhabamu nyaata irra kan ka'e dhiyaana oto hin nyaatin irra darbuun isin muudateera?	1. Eyyee 2. Lakkii	

421	sababa hir'ina qabeenyatiin gosti nyaataa kamiyyuu mana keessanii dhabamee ni beekaa?	1. Eyyee 2. Lakkii	
422	Isin ykn miseensi maati keessan dhabamu nyaata irra kan ka'e oto hin nyaatin rafaun ni jira?	1. Eyyee 2. Lakkii	
421	Isin ykn miseensi maatii kessanii dhabamu nyaata irra kan ka'e oto hin nyaatin oolani buluun ni jira?	1. Eyyee 2. Lakkii	
<b>Kutaa 5; Hojiwwaan uulfatoo ta'an illachisee gaaffilee gaafataman</b>			
501	Yeroo ulfa isa ammaa kana Hojiwwaan kana gaditti tarreeffaaman irratti hirmattani beektuu?	1. Eyyeee 2. Lakkii	
	1.Hojii Mana keessaa yeroo hunda ofumaaf dalagduu? (kan isaan gargaaru hin jiru)	1. Eyyeee 2. Lakkii	
	2. Bishaan baaldii guddaan waraabuu	1. Eyyeee 2. Lakkii	
	3.Wantoota uulfatoo ta'aan ol kaasuu (baachuu)	1. Eyyeee 2. Lakkii	
	4.Muka falaxuu ykn muruu qoraaniif, Margaa muruu ykn haamuu Horiidhaf ykn gaalaafi k.k.f.	1. Eyyeee 2. Lakkii	
	5.Sa'aatii dheeraaf uffata fi meeshale mana keessaa miiccuu	1. Eyyeee 2. Lakkii	
	6.Horii dhiquu fi ykn annaan sa'aa ykn gaalaa elmuu.	1. Eyyeee 2. Lakkii	
	7.Dinnichaa ykn kuduraawwan adda addaa ni shoggortuu (kotokottuuu)	1. Eyyeee 2. Lakkii	
	8.Wantoota akka biqiltuu ykn Jimaa dhaabufaa irratti hirmatanirtuu	1. Eyyeee 2. Lakkii	
	9.gosaa midhaanii kan akka Garbuufi boqolloo faa tuumtaani beektuu yeroo ulfaa.	1. Eyyeee 2. Lakkii	
	10.yeroo dheeraaf ni ijaajjuu ykn dhaabbattuu (yeroo ulfaa), hojiifis ta'ee sababa biraatif.	1. Eyyeee 2. Lakkii	
	11.Hojii keessan guyya guyyaa yoo dalagdaan yeroo dheeraaf ofirra teechaniiti.	1. Eyyeee 2. Lakkii	
502	Bufaata fayyaa ykh Hospitaala yeroo deemtaan sa'aa meeqa isinittii fudhataa?	1. Sa'aa tokkoo gadi 2. Sa'aa tokkoo fi isaa ol	
<b>Kutaa VI; Intimate partner violence/</b>			
	Yeroo ulfa isa ammaa kanatti abbaan manaakee		
601	Si kabaluu ykn waan si miidhuu danda'uu sitti darbateeraa	1. Eyye 2. Lakki	
602	Humnaan si darbeera akk ati kuftuuf	1. Eyye 2. Lakki	
603	Booksiidhaan ykn waan si miidhuu danda'uun si rukuteeraa	1. Eyye 2. Lakki	
604	Garaa keerraa si rukutee beekaa	1. Eyye 2. Lakki	
605	Itti yaadee si hudhee ykn su gubuuf yaaleeraa	1. Eyye 2. Lakki	

606	Sii midhuuf Meshaa waraanaa kan akka cuubee, halbee fi k.k.k fayyadamee ykn fayyadamuuf yaaleeraa.	1. Eyye 2. Lakki	
	Yeroo Ulfa isa ammaa kanattii abbaa manaakee ..... <b>sexual violence /midhaa qunamtii saalaa.</b>		
607	Fedhii keetin ala humnaan si dirqisiisee quunnamtii saalaa raawwatee beekaa?	1. Eyye 2. Lakki	
608	Feedhii keetin ala waan abbaa manaakee sodaattu qofaaf quunnamtii saalaa raawwattee beektaa?	1. Eyye 2. Lakki	
609	abbaan manaa kee waan gosa quunnamtii saalaa jedhee amane, siif garuu waan kabaja ke hir'isu ykn tuffii sitti fakkaate rawwachuuf si dirqisiiseeraa?	1. Eyye 2. Lakki	
	Yeroo Ulfa isa ammaa kanattii abbaa manaakee..... <b>emotional abuse /miidhaa miiraa</b>		
610	Si aarrabse ykn akka ati ilalcha gaarii ofii hin qabannee si taasisee bekaa?	1. Eyyee 2. Lakkii	
611	Namootaa fuulduratti si qaanesssee beekaa	1. Eyyee 2. Lakkii	
612	Ta'e jedhee si sodaachisee ykn dorsisee (fkn sitti iyyuun, waa caccabsuun faa) beekaa?	1. Eyyee 2. Lakkii	
613	Si'i ykn namoota sitti dhiyaatan miidhuuf yaalee beekaa?	1. Eyyee 2. Lakkii	
<b>Part VI: Extraction checklist from medical charts or patients</b>			
701	Yeroo ulfa ammaa kana hordoffii da'umsaan duraa tasistanii turtanii?	1. Eyyee 2. Lakkii	
702	Gaaffi 701 eeye yoo ta'ee si'aa meeqaaf?	1. si'a 4 fi isaa ol 2. si'a 3 fi isaa gadi	
703	At what months of the current pregnancy, you started ANC?	1. _____in weeks 2. Don't know/not sure	
704	How did you give birth? That is mode of delivery	1. Vaginal delivery 2. Assisted delivery 3. Cesarean section	
705	Pregnancy type	1. singleton birth 2. multiple births	
706	What was her haemoglobin level on her current pregnancy?	1. -----g/dl	
707	HIV status of the mother (PICT)	1. Reactive 2. Non-reactive 3. Don't know	
<b>Part VII: newborn characteristic from records</b>			
801	Neonatal birth weight in grams?	1. In gm: _____	
802	Sex of the newborn?	1. Male 2. Female	
803	Gestational age (GA) at Delivery	1. _____wks	
804	Status of the newborn	1. Alive 2. IUFD 3. Stillbirth	
<b>Measurement</b>			
805	MUAC (Take left hand if righthanded, and right hand if left-handed)	2. _____cm	

## 9.5. Amharic Version of Information Sheet and Informed Voluntary Consent Form for participants Aged 18 and Above

ጤና ይስጥልኝ! ወደ ተሳታፊዎች ስሜ -----ነው. የዚህ ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው። ይህ መጠይቅ የተዘጋጀው በሀሮማያ ዩኒቨርሲቲ የነርቪንግ እና ሚድዋይሬሪ ትምህርት ክፍል የ2ኛ አመት የ (Maternity and Neonatal nursing) ተመራቂ ማስተርስ ተማሪ በሆኑት በአቶ ኤልያስ ያዴታ ሲሆን ጥናቱም በሰሜን ሸዋ ዞን በሚገኙ ጤና ተቋማት ውስጥ ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ከሰኔ 10 እስከ ሃምሌ 24 2020/21 ዓ.ም ለማጥናት ፣ ስለ ጥናቱ እና ለጥናቱ ተሳታፊ ለመሆን እንዴት እንደተመረጠዎ ለእርስዎ እንድንገልጽ ትኩረት እንድትሰጡኝ በአክብሮት እጠይቃለሁ ።

### ጥናቱ / የፕሮጀክቱ ርዕስ

በሰሜን ሸዋ ዞን ፣ በመንግስት ሆስፒታል ውስጥ ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናት ብዛት (prevalence) ና የሚያጋልጡ ተዛማጅ ምክንያቶችን ለማጥናት የተዘጋጀ ቃሌ መጠይቅ ነው።

### የጥናቱ ዓላማ / ዓላማ

የዚህ ጥናት ውጤት ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ለማወቅ እና ለጤና እቅድ አውጪዎች ፣ ለአስተዳዳሪዎች ፣ ለፖሊሲ አውጭዎች ፣ ለአውራጃ ጤና ጽ / ቤት እና ለጤና ተቋማት ጠቃሚ መረጃ እና መመሪያን ይሰጣል ። በተጨማሪም የዚህ ጥናት ትልቁ ዓላማ Maternity and Neonatal Nursing የሚያጠናው ዋና መርማሪው ማስተርስ መርሃግብሩን ለመጨረስ የመሜረቅያ ፅሁፍ ለመጻፍ ነው ፡

### አሰራር እና ቆይታ

መረጃ ሰብሳቢዎቹ ለጥናቱ አጋዥ ጠቃሚ መረጃዎችን ለመሰብሰብ መጠይቅ ቅጽ ተጠቅመው በመንግስት ሆስፒታል ውስጥ ከወለደች ሴት ጋር ቃለ መጠይቅ ያደርጋሉ ። መጠይቅ ቅጹ 70 ጥያቄዎች አሉ ። ተሳታፊዎች ቃለመጠይቁን አምኔው ከተሰማሙ ከ 30-35 ደቂቃ የማይበልጥ ጊዜ የሚወስድ ይሆናል።

### ሰጋት እና ጥቅም

በዚህ ጥናት ውስጥ የመሳተፍ አደጋ በጣም አናሳ ነው ፣ ግን ጊዜዎን ብቻ ይወስዳል። በዚህ ጥናት ላይ በመሳተፍዎም ሆነ መጠይቁን በመመለስዎ የተዘጋጀ ክፍያ የለም ነገር ግን ከዚህ ጥናት የሚገኘው መረጃ ለጨቅላ ህጻናት ጤና ደህንነት እና እንክብካቤ ለመስጠት እንዲሁም ልዩ ትኩረት ለመስጠት እና ለችግሩ የመፍትሄ እርምጃ መውሰድ ለሚሹ ለህጋዊ አካላት ትልቅ አስተዋጽኦ አለው።

### ሚስጥራዊነት

የሚሰጡን መረጃዎች በምስጢር ስለሚያዙ በምንም አይነት መንገድ ጉዳዩ ለማይመለከታቸው አካላት አይገለጹም። በዚህ ጥናት በመሳተፍዎ በልጅዎ ወይም በእርስዎ ላይ የሚደርስ ጉዳት የለም። የጥናቱ ግኝት ለጥናቱ ማህበረሰብ አጠቃላይ ይሆናል እናም የግለሰቦችን ማንኛውንም የተለየ ነገር የሚያንፀባርቅ አይኖረውም። ተሳታፊዎችን በቀጥታ ከምርምር ጋር ሊያገናኝ የሚችል በቃል ወይም በፅሁፍ ሪፖርቶች ውስጥ አይካፍትም።

**ሙብቶች**

የእርስዎ በዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ነው። በዚህ ጥናት ውስጥ ለመሳተፍ ወይም ላለመሳተፍ ሙብትዎም የተጠበቀ ነው። ለመሳተፍ ከወሰኑ ከጥናቱ በማንኛውም ጊዜ የመውጣት ሙብት አለዎት። እርስዎ ሊያገኙዎቸው የሚችሏቸው ጥቅማጥቅሞች ይህ አይለያችሁም ፡ መመለስ የማይፈልጉትን ማንኛውንም ጥያቄ ያለመመለስ ሙብቶዎ እንዴተጠበቀው ነው።

**አድራሻ**፣ ስለ ጥናቱ ወይም ስለ አሰራሩ ማንኛውም ጥያቄ ወይም ጥያቄ ካለ ፣ የሚከተሉትን አድራሻዎች በመጠቀም ማነጋገር ይችላሉ።

ዋና መርማሪ፡ ኤልያስ ያደታ

ኢሜይል፡ eliasyadeta262@gmail.com

ሞባይል ስልክ፡ 0924899107

የሐረማያ ዩኒቨርሲቲ ጤና ጥበቃና ሜዲካል ሳይንስ ተቋም የጤና ጥናት ሥነምግባር ግምገማ ኮሚቴ (IHRERC) ።

የቢሮ ስልክ፡ 0254662011                      ፕ.ቢ. 235 ፣ ሀረር

**በመረጃ የተደገፈ ፈቃደኝነት መረጋገጫ**-፤ የተሳታፊውን የመረጃ ወረቀት አንብቤያለሁ ፡ የምርምራውን ዓላማ ፣ አሰራሮችን ፣ አደጋዎችን እና ጥቅሞችን ፣ ጉዳዮችን በግልጽ ተኔግሮኛል። ሚስጥራዊነት ፣ የተሳትፎ ሙብቶች እና ማንኛውም ጥያቄዎችን የምንጤይቅቤት አድራሻም ተጽፎልናል። ግልጽ ባልሆኑ ጉዳዮች ላይ ተሳታፊዎች ጥያቄ የመጠየቅ ዕድልም ተሰጥቷቸዋል ፡ ተሳታፊው በማንኛውም ጊዜ ከጥናቱ የመውጣት ወይም የማይፈልጉትን ማንኛውንም ጥያቄ ያለመመለስ ሙብት እንዳለው ተገለጸልኝ ። ስለሆነም በዚህ ጥናት ላይ ለመሳተፍ በፈቃደኝነት ፈቃዴን በፊርማ” አሳውቃለሁ።

የተሳታፊው ስምና ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

የመጠይቁ ሰብሳቢ ስምና ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

**ስለትብብርዎ በቅድሚያ እናመሰግናለን!**

**9.6. Amharic Version of Information Sheet and Informed Voluntary Consent Form for participants Aged < 18 Years to Be Signed by her Legally Competent Representative (Parent/Guardian).**

ጤና ይስጥልኝ! ወደ ተሳታፊዎች ስሜ -----ነው. የዚህ ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው። ይህ መጠይቅ የተዘጋጀው በሀሮማያ ዩኒቨርሲቲ የነርቪንግ እና ሚድዋይሬሪ ትምህርት ክፍል የ2ኛ አመት የ (Maternity and Neonatal nursing) ተመራቂ ማስተርስ ተማሪ በሆኑት በአቶ ኤልያስ ያዴታ ሲሆን ጥናቱም በሰሜን ሸዋ ዞን በሚገኙ ጤና ተቋማት ውስጥ ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ከሰኔ 10 እስከ ሃምሌ 24 2020/21 ዓ.ም ለማጥናት ፣ ስለ ጥናቱ እና ለጥናቱ ተሳታፊ ለመሆን እንዴት እንዴተመረጠዎ ለእርስዎ እንድንገልጽ ትኩረት እንድትሰጡኝ በአክብሮት እጠይቃለሁ ።

**ጥናቱ / የፕሮጀክቱ ርዕስ**

በሰሜን ሸዋ ዞን ፣ በመንግስት ሆስፒታል ውስጥ ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናት ብዛት (prevalence) ና የሚያጋልጡ ተዛማጅ ምክንያቶችን ለማጣናት የተዘጋጀ ቃሌ መጠይቅ ነው።

**የጥናቱ ዓላማ / ዓላማ**

የዚህ ጥናት ውጤት ከብደታቸው ከትክክለኛው (2.5 ኪ. ግ) በታች ሆነው የሚወለዱ ህጻናትና የሚያጋልጡ ተዛማጅ ምክንያቶችን ለማወቅ እና ለጤና እቅድ አውጪዎች ፣ ለአስተዳዳሪዎች ፣ ለፖሊሲ አውጭዎች ፣ ለአውራጃ ጤና ጽ / ቤት እና ለጤና ተቋማት ጠቃሚ መረጃ እና መመሪያን ይሰጣል ። በተጨማሪም የዚህ ጥናት ትልቁ ዓላማ Maternity and Neonatal Nursing የሚያጠናው ዋና መርማሪው ማስተርስ መርሃግብሩን ለመጨረስ የመሜረቅያ ፅሁፍ ለመጻፍ ነው ፡

**አሰራር እና ቆይታ**

መረጃ ሰብሳቢዎቹ ለጥናቱ አጋዥ ጠቃሚ መረጃዎችን ለመሰብሰብ መጠይቅ ቅጽ ተጠቅመው በመንግስት ሆስፒታል ውስጥ ከወለደች ሴት ጋር ቃለ መጠይቅ ያደርጋሉ ። መጠይቅ ቅጹ 70 ጥያቄዎች አሉት ። ተሳታፊዎች ቃለመጠይቁን አምኔዉ ከተሰማሙ ከ 30-35 ደቂቃ የማይበልጥ ጊዜ የሚወስድ ይሆናል።

**ስጋት እና ጥቅም**

በዚህ ጥናት ውስጥ የመሳተፍ አደጋ በጣም አናሳ ነው ፣ ግን ጊዜዎን ብቻ ይወስዳል። በዚህ ጥናት ላይ በመሳተፍዎም ሆነ መጠይቁን በመመለስዎ የተዘጋጀ ክፍያ የለም ነገር ግን ከዚህ ጥናት የሚገኘው መረጃ ለጨቅላ ህፃናት ጤና ደህንነት እና እንክብካቤ ለመስጠት እንዲሁም ልዩ ትኩረት ለመስጠት እና ለችግሩ የመፍትሄ እርምጃ መወሰድ ለሚሹ ለህጋዊ አካላት ትልቅ አስተዋጽኦ አለው።

**ሚስጥራዊነት**

የሚሰጡን መረጃዎች በምስጢር ስለሚያዙ በምንም አይነት መንገድ ጉዳዩ ለማይመለከታቸው አካላት አይገለጹም። በዚህ ጥናት በመሳተፍዎ በልጅዎ ወይም በእርስዎ ላይ የሚደርስ ጉዳት የለም። የጥናቱ ግኝት ለጥናቱ ማህበረሰብ አጠቃላይ ይሆናል እናም የግለሰቦችን ማንኛውንም የተለየ ነገር የሚያንፀባርቅ አይኖረውም። ተሳታፊዎችን በቀጥታ ከምርምር ጋር ሊያገናኝ የሚችል ቢቃል ወይም በፅሁፍ ሪፖርቶች ውስጥ አይካፍትም።



**ሙብቶች**

የዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት የተመሰረተ ነው ። ሚስት / ሴት ልጅዎ በዚህ ጥናት ውስጥ እንዲሳተፉ ወይም ላለመፍቀድ የማወጅ ሙብት አለዎት ። አጋር / ሚስት / ሴት ልጅዎን ለዚህ ጥናት እንዲፈቅዱ ከፈቀዱ በማንኛውም ጊዜ ከጤናቱ የማግለል ሙብት አለዎት ።

**አድራሻ:** ስለ ጥናቱ ወይም ስለ አሠራሩ ማንኛውም ጥያቄ ካለ፣ የሚከተሉትን አድራሻዎች በመጠቀም ማነጋገር ይችላሉ።

ዋና መርማሪ: ኤልያስ ያደታ

ኢሜይል: eliasyadeta262@gmail.com

ሞባይል ስልክ: 0924899107

የሐረማያ ዩኒቨርሲቲ ጤና ጥበቃና ሜዲካል ሳይንስ ተቋም የጤና ጥናት ሥነምግባር ግምገማ ኮሚቴ (IHRERC) ።

የቢሮ ስልክ: 0254662011                      ፕ.ቢ. 235 ፣ ሀረር

**በመረጃ የተደገፈ ፈቃደኝነት መረጋገጫ፡-** ለእኔ / ለተሳታፊው የመረጃ ወረቀት ተነባብሮልኛል ። የምርምር ዓላማውን ፣ አሰራሮቹን ፣ አደጋዎቹን እና ጥቅሞቹን ፣ ሚስጥራዊነት ጉዳዮችን ፣ የተሳትፎ ሙብቶችን በግልፅ ተረድቻለሁ ። ግልጽ ባልሆኑ ጉዳዮች ላይ ጥያቄዎችን ለመጠየቅ እድሉ ተሰጥቶኛል ። የትዳር አጋሬን / ሚስቴን / ሴት ልጄን በማንኛውም ጊዜ ከጥናቱ የማግለል ወይም የሚፈልገውን ማንኛውንም ጥያቄ የመጠየቅ ሙብት እንዳለኝ ተገለጸኝ ። ስለዚህ ፣ ባልደረባዬ / ሚስቴ / ሴት ልጄ (በፊርማዬ) በዚህ ጥናት ውስጥ እንዲሳተፉ (እንዲሳተፉ) ለመፍቀድ በፈቃደኝነት ፈቃዴን በፍርማዬ አሳውቃለሁ ።

የእናት ቤተሰብ ስምና ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

የመረጃ ሰብሳቢው ስም እና ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

**ስለትብብርዎ በቅድሚያ እናመሰግናለን!**

### 9.4.1. Amharic Version Questionnaires

	የሆስፒታሉ ስም	_____	
	የቃለ መጠይቅ ቀን	_____	
		ቀን    ወር    ዓ. ም	
<b>ክፍል 1: የእናት ግላዊና ማህበራዊ ገጽታ</b>			
101	እድሜሽ ስንት ነው?	_____	
102	ሃይማኖትሽ	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይግለጹ -----	
103	የጋብቻ ሁኔታ	1. ያገባች / አብሮ የምኖሩ 2. ተፋቷል / ተለያይቷል 3. የሞተባት 4. ያላገባች /	
104	የትምህርት ሁኔታ	1. ማንበብ እና መጻፍ አልቻልም 2. መጀመሪያ ደረጃ ትምህርት (1-8) 3. ሁለተኛ ደረጃ ትምህርት (9-12) 4. ከፍተኛ ትምህርት የጨረሱች (ኮሌጅ እና ከዚያ በላይ)	
105	የእናቱ የሥራ ሁኔታ	1. ተማሪ 2. የቤት አመቤት 3. በግል የተቀጠሩ 4. የመንግስት ሰራተኛ 5. ነጋዴ 6. ሌላ ካለ ይጠቀስ -----	
106	አማካይ ወርሃዊ የቤተሰብ ገቢ (ጥሬ ገንዘብ)	1. -----ብር/ ወር	
107	የባል / የትዳር ጓደኛ የትምህርት ሁኔታ	1. ማንበብ እና መጻፍ የማይቻል 2. የመጀመሪያ ደረጃ ትምህርት (1-8) 3. ሁለተኛ ደረጃ ትምህርት (9-12) 4. ከፍተኛ ትምህርት የጨረሱ (ኮሌጅ እና ከዚያ በላይ)	
108	የባል / የትዳር አጋር ሥራ ሁኔታ	1. ተማሪ 2. በግል የተቀጠሩ 3. የመንግስት ሰራተኛ 4. ነጋዴ 5. አርሶ አደር 6. ሌላ ካለ ይጠቀስ: -----	
109	የቤተሰብ ብዛት	1. በቁጥር _____	
<b>ክፍል II-ከወሊድ እና ሥነ ተዋልዶ ጋር የተያያዙ ሁኔታዎች</b>			
201	ስንተኛ እርግዝናሽ ነው?	1. በቁጥር: -----	
202	ስንት ልጆች ወልደሻል? ሁሉም ከ 28 ሳምንት በኋላ በህይወት የተወለዱ ወይም የሞቱ ያጠቃልላል.	1. በቁጥር: _____	

203	የእርግዝና ዓይነት?	1. የታቀደ እና የሚፈለግ 2. ያልታቀደ ግን የሚፈለግ 3. ያልታቀደ እና የማይፈለግ	
204	አሁን በተወለደው ልጅሽና በፊት በወለድሽው መካከል ያለው የእድሜ ልዩነት	1. $\leq 2$ ወር 2. $< 24 - 47$ ወር 3. $\geq 48$ ወር	
205	የጽንሰ ማቋረጥ አጋጥሞሽ ያውቃል?	1. አዎ 2. የለም	207
206	ስንት ጊዜ ጽንሰ ማቋረጥ አጋጠመሽ?	1. በቁጥር _____	
207	ጊዜው ሳይደርስ የተወለደህ ህጻን አለሽ	1. አዎ 2. የለም	
208	የወሊድ መከላከያ ተጠቅሜሽ ታወቁያሌሽ	1. አዎ 2. የለም	
<b>ክፍል II I የእናቶች የሕክምና እና የወሊድ ምክንያቶች</b>			
	<b>ጢያቄ</b>	<b>መልሶች</b>	<b>ዝላል</b>
301	በአሁኑ እርግዝናሽ ያጋጠመሽ አጠቃላይ የጤና እክል ነበር	1. አዎ 2. የለም	
302	መልሰዎ አዎ ከሆነ ከሚከተሉት ዉስጥ ምን አይነት የጤና ችግር ነበር?	1. ምጥ ከመምታቱ በፊት በብልት የደም መፍሰስ 2. የሽንት ዉሃ መፍሰስ ያለጊዜው 3. በእርግዝና ምክንያት የሚፈጠር የደም ግፊት 4. የሽንት ቱቦ ኢንፌክሽን 5. ማቅለሽለሽ እና ማስታወክ 6. ሌላ ካሌ ይግለጹ	
303	የስኳር በሽታ አለብሽ	1. አዎ 2. የለም	
304	በአሁኑ እርግዝናሽ በእርግዝና ምክንያት የሚፈጠር የስኳር በሽታ ይዘሽ ነቤር	1. አዎ 2. የለም	
305	በእርግዝናሽ ወቅት ለደም ማነስ የሚሴጥ (የአይረን ፎስፌት) እንክብሎች ወስደሽ ነበር?	1. አዎ 2. የለም	
306	ለ309 ኛው ጥያቄ መልሰዎ አዎ ከሆነ ለምን ያህል ቀን እንክብሎችን ወስደሻል??	1. የቀኖች ብዛት: _____	
307	በእርግዝና ወቅት የደም ማነስ እንዳለብሽ ተነግሮሻል??	1. አዎ 2. የለም	
308	ለረጅም ጊዜ የሚቆይ የጤና ችግር አለብሽ??	1. አዎ 2. የለም	
309	312ኛው ጥያቄ መልሰዎ አዎ ከሆነ ምን አይነት የጤና ችግር ነበር?	1. ለረጅም ጊዜ የቆየ የደም ግፊት 2. የስኳር ቤሽታ 3. የልብ ህመም 4. የኩላሊት ቤሽታ 5. ሌሎች ካሉ (ይግለጹ) _____	
<b>ክፍል አራት; የእናቶች የአመጋገብ ሁኔታ በተመለከተ</b>			
401	በጽንሰ ክትትልሽ ወቅት ስለ አመጋገብሽ ምክር ተሰጥቶሽ ነበር?	1. አዎ 2. የለም	
402	በአሁኑ እርግዝናሽ ጊዜ ከእስካሁኑ አመጋገብሽ ተጨማሪ ምግብ ተመግበሻል?	1. አዎ 2. የለም	
403	ባሁኑ እርግዝና በፊት በቀን ስንት ጊዜ ትመኔቢ ነቤር?	1. _____ ጊዜዎች	

404	ባሁኑ እርግዝናስ በቀን ስንት ጊዜ ትመኔብ ነቤር?	1. አንዴ 2. ሁለት ጊዜ 3. ሶስት ጊዜ 4. አራት ጊዜ እና ከዚያ በላይ	
405	ባሁኑ እርግዝናሽ ትጸም ነቤር?	1. አዎ 2. የለም	
406	ባሁኑ እርግዝናሽ መመኔብ ያቆሙት የምግብ አይኔት ነቤር	1. አዎ 2. የለም	
407	በእርግዝናሽ ወቅት አልኮል ትጠጭ ነበር?	1. አዎ 2. የለም	
408	ለ 407 መልሶ አወ ከሆነ ምን ያክል ጊዜ ትጠጭ ነበር?	1. ሁሌም 2. ብዙውን ጊዜ 3. አልፎ አልፎ	
409	በእርግዝናሽ ወቅት ጫት ትቅሚ ነበር??	1. አዎ 2. የለም	
410	ለ 409 መልሶ አወ ከሆነ ምን ያክል ጊዜ ትቅሚ ነበር?	1. ሁሌም 2. ብዙውን ጊዜ 3. አልፎ አልፎ	
411	በእርግዝናሽ ወቅት ሲጋራ ታጨሽ ነበር?	1. አዎ 2. የለም	
412	ለ 411 መልሶ አወ ከሆነ ምን ያክል ጊዜ ታጨሻለሽ??	1. ሁሌም 2. ብዙውን ጊዜ 3. አልፎ አልፎ	
413	ባሁኑ እርግዝናሽ ባህላዊ መድሃኒት ወስዴሽ ነቤር	1. አዎ 2. የለም	
414	በለቤተዎ / የትዳር ጓደኛ ሲጋራ ያጨስ ነበር?	1. አዎ 2. የለም	
<b>Food insecurity</b>			
ባለፉት አራት ሳምንታት ውስጥ.....			
415	በቂ ምግብ ቤት ውስጥ አይኖርም ብለሽ ተጨንቀሽ ነበር?	1. አዎ 2. የለም	
416	በሃብት እጥረት ምክንያት የመረጡትን ምግብ አይነት መመገብ ያልቻልሽበት ጊዜ ነበር?	1. አዎ 2. የለም	
417	በሃብት/የመግዛት አቅም ስላልነበራችሁ የተወሰነ የምግብ አይነት በልተሽ ነበር?	1. አዎ 2. የለም	
418	ምግብ ስላነሰ ወይም ገንዘብ ስለሌለ የማትፈልግዉን ምግብ ተመግቦሽ ነበር?	1. አዎ 2. የለም	
419	በቂ ምግብ ስለሌለ ከሌላው ጊዜ ያነሰ ምግብ ተመግቦሽ ነበር?	1. አዎ 2. የለም	
420	በቂ ምግብ ባለመኖሩ ምክንያት በቀን ውስጥ በጣም ትንሽ ምግብ የተመግቦሽ ቀን አለ?	1. አዎ 2. የለም	
421	ባለፈው ወር ውስጥ ምንም አይነት ምግብ ቤት ውስጥ ሳይኖር ቀርቶ ያውቃል	1. አዎ 2. የለም	
422	በቂ ምግብ ባለመኖሩ ምግብ ሳይበሉ ተኝተው ነበር?	1. አዎ 2. የለም	
423	በምግብ እጥረት ምክንያት ባለፈው ወር ውስጥ ቀንና ማታ ምንም ምግብ ሳይበሉ ያሳለፉት ግዜ አለ?	1. አዎ 2. የለም	
<b>ክፍል V፤ በእርግዝና ወቅት ከባድ አካላዊ ሥራን በተመሌኩት</b>			
501	በአሁኑ እርግዝናሽ ከዚ በታች የቴዘረዘሩት ሥራዎችን ሴርቴዉ ያዉቃሉ	መልስ ቦታ አዎ	የለም

	1. በየቀኑ የቤት ውስጥ ሥራዎችን ያሌገረፍት መሰራት።		
	2. በትላልቅ ባልዲዎች ውሃን መቅዳት።		
	3. ከባድ ሽከምቶችን ማንሳት።		
	4. እንጨቶችን መቁረጥ ፣ ለከብቶች ሳርን መቁረጥ።		
	5. ልብሶችን / ዕቃዎችን ለረጅም ጊዜ ማጤብ።		
	6. ከብቶችን ማጠብ እና ወተት ማለብ።		
	7. ድንች/ሸንኩርት መቆፈር ወይም የመሳሰሉትን ሥራ ማሰራት።		
	8. ዘርቶችን መትከል ለምሳሌ እንዴት ፤ ዲንች፣ ሸንኩርት መትከል።		
	9. በእረግዚናሽ ግዜ ጥራጥሬ እህሎች (ለምሳሌ ገብስ፣ ቦቆሎ) የሚሳሰሉትን በመቆጫ ወቅቴሽ ታወቅያሌሽ		
	10. በእረግዚናሽ ግዜ ረዘም ላለ ሰዓት ይቆማሉ።		
	11. በእረግዚናሽ ግዜ የዕለት ተዕለት ሲራዎን ሲሴሩ ሌረጅም ሰዓት ተቀምጦዎት ነዉ?		
502	ወደ ጤና ተቋም ለመድረስ ምን ያህል ጊዜ ይወስዱበሻል?	1. ከ 1 ሰዓት በታች 2. 1 ሰዓት እና ከዛ በላይ	


**ክፍል VI; በእርግዝና ወቅት የቅርብ አጋር ጥቃትን በተመለከተ**

	በመጨረሻዉ እርግዝና ጊዜዎ ባለቤቶ ወይም የቅርብ ጓደኛዎ.....		
601	በኃይል ገፍቶዎት ያውቃል	1. አዎ 2. አይደለም	
602	በጥፊ መመታት ወይም ሊጎዳዎት የሚችል ነገር ወርጫዎን ያውቃል።	1. አዎ 2. አይደለም	
603	በቡጢ ወይም እርሶን በሚጎዳ ነገር መትቶዎት ያዉቃል	1. አዎ 2. አይደለም	
604	ሆዶዎን መትቶዎት ያዉቃል።	1. አዎ 2. አይደለም	
605	አቅዶ አንቆዎት ወይም አቃጥልዎት ያዉቃል?	1. አዎ 2. አይደለም	
606	እርሶን በምጎዳ ነገር ቢላዋ፣ጥይት ወይም ሌላ መሣሪያ ተጠቅሞ ወይም ልጠቀም ሞክሮ ያዉቃል?	1. አዎ 2. አይደለም	
	በመጨረሻዉ እርግዝና ጊዜዎ ባለቤቶ ወይም የቅርብ ጓደኛዎ.....		
607	እርሶ ሳይፈልጉ ግብረ ሥጋ ግንኙነት እንድያደርጉ አስገድዶ ያዉቃል?	1. አዎ 2. አይደለም	
608	የትዳር አጋሯን በመፍራት ወሲባዊ ግንኙነትን ማድረግ ወይም እምብ ባሉቤት ጊዜ አስገድዶ ግብረ-ሥጋ ግንኙነት አድርጎ ያዉቃል።	1. አዎ 2. አይደለም	
609	እርሶ የማይፈልጋቸዉ ሌሎች ወሲባዊ ድርጊቶችን ለመፈፀም አስገድዶሽ ነበር (እርሶ ከብራን ይነካል የሚለትን ወሲባዊ ድርጊቶችን እንድያደርጉ አስገድዶ ያዉቃል? ::	1. አዎ 2. አይደለም	
	በመጨረሻ እርግዝና ጊዜዎ ባለቤትዎ ወይም የቅርብ ጓደኛዎ.....		
610	ስድቦዎት/ዘልፎዎት ወይም ስለራስዎ ጥሩ ስሜት እንዳይሰማዎት አድርጎ ያዉቃል።	1. አዎ 2. አይደለም	
611	በሰዎች ፉት አዋርዶዎት ያዉቃል።	1. አዎ 2. አይደለም	

612	ሆን ብሎ እርሶን ለማስፈራራት ሞክሮ ያወቃል (ለምሳሌ በመጮህ ወይም ዕቃዎችን በመስበር)?	1. አዎ 2. አይደለም	
613	እርሶን ወይም በእርሶ ሀሊፍነት ስር ያለውን ሰው ለመጉዳት አስፈራርቶ ያውቃል?	1. አዎ 2. አይደለም	
<b>ክፍል VI: - ከሕክምና ካርድ የምሞላ</b>			
701	በአሁኑ እርግዝና የጽንሰ ክትትል አድርገሽ ነበር?	1. አዎ 2. የለም	
702	ለ701 አዎ ከሆነ ስንት ጊዜ	1. 4 ና ከዛ በላይ 2. 3 ና ከዛ በታች 3. የለም	
703	በስንተኛ ወርሽ ላይ ነው ክትትል የጀመርሽው? ?	1. _____ በሳምንታት ይገለጻል 2. አላውቅም / እርግጠኛ አይደለም	
704	በምን ወለድሽ?	1. በምጥ 2. በመሳሪያ የታገዘ 3. በቀዶ ህክምና	
705	የእርግዝና አይነት	1. Singleton birth 2. Multiple birth	
706	የደም ልኬት መጠን?	1. ----- g/dl	
707	የእናቱ ኤች አይ ቪ ሁኔታ (PICT)	1. Reactive 2. Non-reactive 3. Don't know	
<b>ክፍል VII: አዲስ የተወለደ ህጻን በተመለከቱ</b>			
801	የህፃኑ ክብደት?	1. _____ ግራም	
802	የህጻኑ ጾታ??	1. ወንድ 2. ሴት	
803	የእርግዝና ጊዜ Gestational age (GA) በመለኪያ	1. _____ በሳምንት	
<b>Measurements</b>			
804	MUAC (የእናት የዋ የከንድ ልኬት)	2. _____ ሴ.ሜ.	

### 9.3. Curriculum Vitae (CV) of the Principal Investigator

#### I Personal Identification

	Name	Elias Yadeta Debele
	age	27
	sex	Male
	Birthplace	Oromia Region, North Shoa Zone, Kuyu district
	Date of birth	10/10/1986 E.C
	Marital status	Single
	Citizens	Ethiopian
	Address	Mobile-+251924899107 Email-eliasyadeta262@gmail.com

#### II Educational Background

Level of education	Name of school/Institution	Year in G.C
Elementary School (1-8)	Lafto Gulenta Elemntary School	2003-2010
Secondary school (9-10)	Gebre Gurecha Secondary School	2011-2012
Preparatory school (11-12)	Gebre Gurecha Preparatory School	2013-2014
Undergraduate (BSc)	Haramaya University, College of Health and Medical sciences	2015-2018

#### III Language Proficiency

No	Language	Listening	Reading	Speaking	Writing
1	Afan Oromo (Mother's tongue)	Excellent	Excellent	Excellent	Excellent
2	Amharic	Excellent	Excellent	Excellent	Excellent
3	English	Excellent	Excellent	Very good	Excellent

## **Personal skill**

- I have Very Good Communicative Skills
- I possess Sufficient computer skills i.e. networking, Programming and Maintenance
- I'm a team player happy to work with others and share knowledge and skills.
- I strive to be a learner, keen to learn and improve my skills.
- I can work well under pressure.

## **Experiences**

- 2011-2012 Graduate assistant II at Haramaya University.
- Now I am an Assistant Lecturer and MSc student at Haramaya University.

## **Hobbies**

- Having good relation with persons, use the internet, participating in volunteer activity and serve my community.
- Reading different kinds of literature
- Enjoying with family & reading different books

## **Training/ seminar**

- Induction training on instructional skills

## **Reference**

Mr.Teshale Mulatu (BSC, MSC, Assistant professor), Former Head of midwifery department at Haramaya University, College of Health and Medical science.



