HARAMAYA UNIVERSITY

POST GRADUATE PROGRAM DIRECTORATE

PREVALENCE OF NEURAL TUBE DEFECTS AND ASSOCIATED FACTORS AMONG NEONATES ADMITTED TO NEONATOLOGY UNIT, AT HIWOT FANA SPECIALIZED UNIVERSITY HOSPITAL

BY- DR YUNUS EDRIS (MD)

A RESEARCH PROPOSAL TO BE SUBMITTED TO SCHOOL OF MEDICINE , COLLEGE OF HEALTH AND MEDICAL SCIENCES, HARAMAYAUNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALITY CERTIFICATE IN PEDIATRICS AND CHILD HEALTH

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BY- DR YUNUS EDRIS (MD)

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DECEMBER, 2019

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List of Abbreviations and Acronyms

AED	Anti-Epileptic Drug
ANC	Ante-Natal Care
CNS	Central Nervous System
CPAP	Continuous Positive Air Pressure
DALYs	Disability-adjusted life years
FA	Folic Acid
HFSUH	Hiwot Fana Specialized University Hospital
HMIS	Health Management Information System
KMC	Kangaroo Mother Care
MMC	Myelomeningocele
NTD	Neural Tube Defect
OR	Odd Ratio
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

Summary

Background: Neural tube defects account for most congenital anomalies of the central nervous system. Globally, it is estimated that approximately 300,000 babies are born each year with Neural tube defects, resulting in approximately 88,000 deaths and 8.6 million disability-adjusted life years. Despite the national burden of the disease, studies that assess the national magnitude and their associated factors are limited. As far as our knowledge, no previous study is present to determine the magnitude of neural tube defects and their associated factors in the study area.

Objective: This study aims to determine the magnitude of neural tube defects and their associated factors among neonates admitted to neonatology unit at Hiwot Fana Specialized University Hospital, Harar, Ethiopia from December 15, 2019 to February 15, 2020

Method: A hospital-based cross-sectional study will be employed. All neonates and their respective mothers who are admitted to HFSUH neonatal unit during the study period will be included with non-probability convenience sampling technique. Sample size will be 420. Data will be collected using a structured questionnaire, entered into Epi Data version 4.1, transferred and analyzed using SPSS version 21.0 software. Descriptive statistics including frequency and proportions, means will be calculated. The odds ratio at 95% confidence interval will be used to check for the strength of the association between dependent and independent variables. Statistically significant will be declared at P-value < 0.05.

Expected outcome: High prevalence of neural tube defect will be expected from this study since previous studies from developing countries show a high prevalence of neural tube defect.

Budget: To conduct this study a total of 25000.0 ETB birr will be required.

Key Words: Neural tube defect, Neonates, Hiwot Fana Specialized University Hospital, Ethiopia

1. Introduction

1.1.Background

Congenital abnormalities are defects of structure or function, including metabolism, which can be diagnosed during intrauterine fetal life, at birth, or later in life. Major abnormalities may be life-threatening or have the potential to result in disability and therefore constitute a tremendous physical, financial, and emotional burden on the affected families (Christianson *et al,* 2006). Globally, an estimated 4,800,000 infants, constituting nearly 3% of all births are born with serious birth defects (Cannon, 2016).

Neural tube defects (NTDs) account for most congenital anomalies of the central nervous system (CNS) and result from failure of the neural tube to close spontaneously between the 3rd and 4th weeks of in-utero development. Neural tube defects can be classified as "open" NTDs in which the neural tissue is exposed and "closed" NTDs with the neural tissue covered by tissue. With open spinal Bifida, some of the vertebrae are not completely formed but are split or divided and the spinal cord and its coverings (the meninges) protrude through the opening (Imbard *et al*, 2013). The most severe is where the spinal cord and meninges come out of the child's back (Adzick, 2013).

The specific cause of neural tube defect remains unknown, but both genetic and environmental risk factors have been proposed. In terms of genetic underpinnings, monozygotic twinning and single-gene disorders have long been associated with NTDs (Wallingford *et al*, 2013**)**. Numerous studies have explored a variety of candidate gene pathways such as the folate/1-methyl carbon metabolic pathway glucose metabolism/transport DNA repair, oxidative stress pathway retinoic acid receptors. In addition to genetic factors, environmental influences such as parental occupation, maternal obesity, maternal use of anti-convulsant, and maternal nutritional status have been related to NTDs(Imbard *et al,* 2013).

These serious errors in the development of the central nervous system can cause death or permanent damage to the brain, spinal cord, and spinal nerves. Many children affected by neural tube defects have multiple lifelong disabilities, including varying degrees of lower-limb paralysis, bowel and bladder incontinence, hydrocephalus, intellectual and learning disabilities (Sutton *et al*, 2008).

Infants born with neural tube defects require surgical closure of the defect within the first few days of life and lifelong supportive care. The conventional treatment of spinal Bifida has been to undertake a postnatal repair within two days of birth and the placement of a ventriculoperitoneal shunt to relieve ventriculomegaly or hydrocephalus (Adzick, 2013). On the other hand, spinal Bifida can be diagnosed with prenatal ultrasound or maternal serum alpha-fetoprotein and in utero treatment could be undertaken, but it involves surgical incision into the mother's abdomen and uterus to access the unborn baby. In utero repair is associated with a reduced need for shunt placement after birth and a reduction in the risk of hindbrain herniation. However, it was associated with an increased risk of preterm ruptured membranes and subsequent preterm birth for women and their infants (Howell *et al*, 2018).

1.2. Statement of the problem

Neural tube defects (NTDs) are common complex congenital malformations of the central nervous system resulting from the failure of the neural tube closure during embryogenesis (Gedefaw *et al,* 2018).

The prevalence of NTDs varies widely based on geographic region and ethnical grouping, making them one of the most frequent congenital malformations. Globally, it is estimated that approximately 300,000 babies are born each year with NTDs, resulting in approximately 88,000 deaths and 8.6 million disability-adjusted life years (DALYs)(Sutton *et al*, 2008). According to the WHO prevalence estimate of congenital anomalies, the incidence of neural tube defect is 11.7 per 10,000 births in Africa(Cannon, 2016).

In Ethiopia, the prevalence of NTDs was 63.4 per 10,000 births (95% CI, 51–77). Concerning types of NTD, the birth prevalence of anencephaly was 17.3 cases per 10,000 live and stillbirths; the prevalence of encephalocele was 3.5 cases per 10,000 live and stillbirths; and spinal Bifida prevalence was 40 cases per 10,000 live and stillbirths(Gedefaw *et al,* 2018).

Neural tube defects stand out as one of few birth defects for which primary prevention strategies are available and thus pre-conceptional supplementation of 400 mcg of folic acid is one common preventive strategy. Generally, there are three potential approaches for the delivery of folic acid to the general population: improvement of dietary habits, fortification of food and use of supplements(Imbard *et al,* 2013). The developed countries already implemented periconceptional folic acid supplementation, and demonstrate that maternal periconceptional supplementation with folic acid can reduce the risk of NTDs in offspring. In the United Kingdom and Ireland, yearly prevalence of neural tube defects declined, predating any periconceptional folic acid

supplementation policy initiatives, from 45 per 10 000 births in 1980 to 10 to 15 per 10 000 in the 1990s(Busby *et al.*, 2005).

Despite the national burden of the disease, studies that assess the national burden and their associated factors are limited. As far as our knowledge concerned, no previous studies conducted to determine the burden of neural tube defects and their associated factors in the study area. Taking this into consideration, this study is aimed to determine the magnitude of neural tube defects and their associated factors among neonates admitted to the neonatology unit at Hiwot Fana Specialized University Hospital, Harar, Ethiopia.

1.3. Significance of the study

The result of this study will be used to Hiwot Fana University Hospital to develop its protocol on how to approach to reduce neural tube defects by identifying possible preventable associated factors and early treatment options. Besides, it will help Harari Regional Health bureau program planners, and supporting stakeholders on the measure to be taken in the prevention and treatment of neural tube defects based on this study. It also provides information on the magnitude of neural tube defects and associated factors for researchers who want a further study on the same area or topics.

1.4. Objective

1.4.1. General Objective

To assess the prevalence of neural tube defects and its associated factors among neonates admitted to the neonatology unit at HFSUH, eastern Ethiopia from December 15, 2019 to February 15, 2020

1.4.2. Specific Objectives

- To determine the prevalence of neural tube defects
- To assess associated factors of neural tube defects

2. Literature review

2.1. The prevalence of neural tube defects

Despite the global burden of the disease data on the prevalence and associated factors was not is as such. In a study conducted in Saudi Arabia, 977 infants were hospitalized to the NICU during the study period. Out of the hospitalized infants, 64 had NTD giving an incidence of 0.78/1000 births. Myelomeningocele 45 (70%) and encephalocele 15(23%) were the common types of the lesion(Asindi and Al-shehri, 2001).

A retrospective study conducted at Batna Maternity Hospital in Algeria and the incidence of NTD was 1.58 per 1000 births with higher frequency in females (70%) ($p < .05$). Among the cases of neural tube defects, 66% had open spina bifida, 19.5% had anencephaly, and 5.5% was affected by encephalocele (Bourouba *et al* ,2018)

In a hospital-basedd study of 284 infants, conducted at Jos Teaching Hospital (JUTH), in Nigeria, 144 were male and most, 165 (58%) women received antenatal care. The incidence of NTD was 0.5/1000 live births and is 1.9% of all admission. Spina bifida constituted 97% of the total NTDs out of which 226(79.6%) had Myelomeningocele. The most commonly affected site was the lumbosacral (55.8%) and thoracolumbar (31.9%) region (Uba *et al.*, 2004).

In a study conducted in the neonatology unit of the mother and child center of Yaoundé Cameroon, most 48(69.57%) of the admitted patients were male and the sex ratio (male-to-female) was 2.28. Myelomeningocele was the predominant (47 cases (68.11%)) types of malformation, followed by encephalocele (19 cases (27.54%)). Surgical closure of the defect was done for 44 (89.8%) patients, while ventriculoperitoneal shunting was done in 25 (78.1%) of cases with hydrocephalus. Of the total patients, 41 (83.7%) were discharged after surgical repair of the defect, two (4.1%) were discharged against medical advice while three (6.0%) died before surgery(Paul *et al.*, 2008).

Another study conducted in Cameroon reported an incidence of NTD of 4.5/1000 births. Of the total 49 cases of NTD, 29 were male and a male to female ratio was 1.5:1.

Myelomeningocele was the most common (80.4%) type of NTD, followed by meningocele (17.4% of cases), and the most common site of the defect was lumbosacral region (47.8%) (Motah *et al.*, 2017).

In a study conducted in Uganda, spina bifida was identified in 201patients during the study period, out of which 77 (38%) were female. The majority of 185(92%) had Myelomeningocele, while 87 (43%) had concurrent Myelomeningocele and hydrocephalous. Four patients died in the hospital while 103(51%) were discharged and the median time to surgery range from 1-33 days(Xu *et al.*, 2018).

The study performed at University Teaching Hospital (UTH) and Beit Cure Hospital (BCH) in Lusaka, Zambia. Most (56%) of study participants were aged between one to six months and 139 (55%) were male. From the total 253 patients with spina bifida, 155 (61%) had hydrocephalous while 98 (39%) had spina bifida alone. Myelomeningocele was the most common defect and the lumbar region was the frequently affected site ($p < 0.001$). Hundred seventy-seven (70%) patients underwent defect repair only while 25 (10%) received ventriculoperitoneal shunting and defect repair(Mweshi *et al.*, 2011).

From the cross-sectional study performed at Soba university hospital and Omdurman maternity hospital, in Sudan; the prevalence of NTDs was 2.8: 1000, and fifty-six (54.4%) were females. Forty-nine (47.7%) cases had myelomeningocele, 18 (17.5%) cases had anencephaly, and 14 (13.6%) cases had encephalocele. The majority of 76 (73.8%) of the newborns were referred to the pediatrics surgery and 27 (26.2%) died (Omer *et al.*, 2016).

A case-control study conducted in Tigray, Ethiopia assessed 14,903 pregnancy outcomes for the occurrence of NTD during the study period. From the total of assessed pregnancy outcomes, 205 mothers who born infants with NTDs were identified and the overall incidence of NTDs was 13.8 per 1000 pregnancy outcome. Concerning types of NTD, anencephaly in 48% (99/205), spina bifida in 47% (96/205) and encephalocele in 5% (10/205) were identified(Alem *et al.*, 2019)

Based on the case-control study conducted by Atlaw et al., 2019 in Bale Ethiopia the occurrence patterns of NTDs identified were anencephaly, myelomeningocele, meningocele and spina bifida occulta accounts for (32 (76.2%), 5(11.9%), 4(9.5%) and 1 (2.4%)), respectively(Atlaw *et al.*, 2019)

2.2 Factors Associated with Neural Tube Defect

2.2.1 Maternal socio-demographic factors

Based on case control study conducted in 2003 in Shanxi province, northern China , a primary school education or lower (AOR 2.32, CI 1.09- 4.97), maternal age < 25 years (AOR=3.36; CI, 1.89–5.36) and >35 years; (AOR=5.21, CI, 2.42–11), second birth order (AOR=2.15, CI, 1.25-3.6) and third birth order (AOR=3.93, CI, 1.69–9.17) were among the significant risk factors of neural tube defect (Li *et al*, 2006).

Based on the case-control study conducted from October 2017 to February 2018 in Bale Ethiopia reported that maternal age between 15- 24 years (OR=4.78, 95%CI, 1.10-20.66), consanguineous marriage (COR=5.54, 95%CI, 1.47-20.87) were reported as factors associated with Neural Tube Defect(Atlaw *et al.*, 2019)

Based on the hospital based cross sectional and unmatched case control study conducted between February and August, 2016 in Addis Ababa of Ethiopia reported that annual cash family income less than $1,300 USD (AOR, 2.5; 95%, 1.2–5.5), $1,300–1,800 USD (AOR, 2.8; 95%, 1.3–5.8), and $1,801–2,700 USD (AOR, 2.6; 95%, 1.2–5.8) were found to be significant factors associated with NTDs (Gedefaw *et al*, 2018).

According to hospital based unmatched case control conducted from November to May, 2018 in Addis Ababa, Ethiopia reported that maternal age, < 19(AOR 9.8 CI 2.64 -36.3), maternal age 20-24 (AOR 2.4 CI 1.04 -5.83) were strongly associated to risk of NTDs (Aynalem *et al,* 2018).
Based on the descriptive cross sectional retrospective study conducted from January 2005 to April 2015 in Cameroon, maternal age and socio-economic status were found to be the main risk factors of Neural tube defect (at P-valve <0.05) (Motah *et al.*, 2017)**.**

2.2.2 Neonatal socio-demographic factors

According to hospital based unmatched case-control study done from 2002 to 2006 in Riyad reported that NTD was twice as common in females (Murshid *et al*,2014).

According to a descriptive study done from January 8, 1999 to July 31, 2000 in das clínicas hospital in Brazil, Neural tube defects were more often found among low weight live born infants (<2,500 g), p<0.001 (Aguiar *et al*, 2003).

Based on the hospital based cross sectional and unmatched case control study conducted between February and August, 2016 in Addis Ababa of Ethiopia reported that being male sex neonate (AOR, 0.56; 95% CI, 0.33–0.94) and normal or underweight body mass index of neonate (AOR, 0.49; 95%, 0.29–0.95) were protective of NTDs (Gedefaw, *et al*, 2018).

2.2.3 Events during previous pregnancy

Based on the case control study conducted in 2003 in Shanxi province, northern China , history of a previous birth defect affected pregnancy (AOR 5.27, 95% CI 0.98, 28.37); radiation exposure as therapy (AOR 1.91 CI, 1.35–2.72) were among the significant risk factors of neural tube defect (Li et al, 2006).

Based on the case control study conducted from October 2016 to June, 2017 in Tigray regional state of Ethiopia finding reported that history of stillbirths (COR 19.1 CI 4.28 -85.48, p .0001) was strongly associated with risk of having pregnancy outcome afflicted with NTDs (Alem *et al.*, 2019).

According to hospital based unmatched case control conducted from November to May, 2018 in Addis Ababa, Ethiopia reported that family history of neural tube defects (AOR 43.5 CI 1.2-1506.9) was strongly associated to risk of NTDs (Aynalem *et al,* 2018).

2.2.4 Events during current pregnancy

Based on case control study conducted in 2003 in Shanxi province, northern China ,use of analgesic and antipyretic drugs (AOR 4.89, 95% CI 0.92, 25.97) was a significant risk factors of neural tube defect (Li *et al*, 2006).

According to case control study conducted from 2000 to 2008 in Italy, mothers who didn't take pre-conception folic acid (COR=27 CI, 9.31–78) was significant factors associated with NTD (De Marco *et al*, 2011**)**.

Based on the case-control study conducted from October 2017 to February 2018 in Bale Ethiopia reported that folic acid supplementation (COR=0.095, 95%CI, 0.031-0.285) was as factors associated with Neural Tube Defect(Atlaw *et al.*, 2019).

Based on the descriptive cross sectional retrospective study conducted from January 2005 to April 2015 in Cameroon, lack of folic acid supplementation during pregnancy was found to be the main risk factors of Neural tube defect (at P-valve <0.05)(Motah *et al.*, 2017).

2.2.5 Maternal comorbidity

Based on case control study conducted in 2003 in Shanxi province, northern China history of a fever or 'cold' (AOR 3.36, 95% CI 1.68, 6.72) was the significant risk factors of neural tube defect (Li *et al*, 2006).

Based on the prospective descriptive study done in three selected Kano metropolis hospitals in north-western Nigeria from April to December,2013, hyperglycemia due to Maternal pre-gestational diabetes mellitus has been found to cause a 2-fold to 10-fold increase in risk of CNS malformations including NTDs among the offspring of affected women, relative to the general population. Its teratogenic effect is believed to be due to embryonic exposure to hyperglycemia that has been shown to inhibit the uptake of myo-inositol, which is essential for embryonic development during gastrulation and neurulation stages of embryogenesis (chukwuemeka *et al* ,2015)

According to hospital based unmatched case control conducted from November to May, 2018 in Addis Ababa, Ethiopia reported that maternal fever/febrile illness (AOR 65.5 CI 4.4 -957.9) was strongly associated to risk of NTDs (Aynalem *et al,* 2018).

Based on the descriptive cross sectional retrospective study conducted from January 2005 to April 2015 in Cameroon, maternal fever during the first trimester of pregnancy was found to be the main risk factors of Neural tube defect (at P-value <0.05) (Motah *et al.*, 2017).

2.2.6 Maternal lifestyle

Based on case control study conducted in 2003 in Shanxi province, northern China , daily passive exposure to cigarette smoke (AOR 1.60, 95% CI 0.94, 2.73) was among the significant risk factors of neural tube defect (Li *et al,* 2006).

According to hospital based case control study conducted from 2000 to 2008 in Italy, high caffeine intake (≥3cups per day) (COR=7.78, CI, 4.02–15.05), maternal smoking habits (COR=1.91, CI 1.16–3.14) and alcohol intake (COR= 3.69, CI, 2.12–6.42) were significant factors associated with NTD (De Marco *et al*, 2011**)**.

Based on the case-control study conducted from October 2017 to February 2018 in Bale Ethiopia reported that being passive smokers (COR=11.08, 95%CI, 1.96-62.69) was factor associated with Neural Tube Defect(Atlaw *et al.*, 2019).

Based on the hospital based cross sectional and unmatched case control study conducted between February and August, 2016 in Addis Ababa of Ethiopia reported that taking folic acid or multivitamins during first trimester (AOR, 0.47; 95%, 0.23–0.95) was protective of NTDs (Gedefaw, *et al*, 2018).

According to hospital based unmatched case control conducted from November to May, 2018 in Addis Ababa, Ethiopia reported that caffeine intake for ≥3 cups/day (AOR 8.14 CI 4.02 -16.4) and maternal external exposure to cigarette smoke was strongly associated (AOR 2.49 CI 1.15 - 5.11) (Aynalem *et al,* 2018).

2.3 Conceptual frameworks

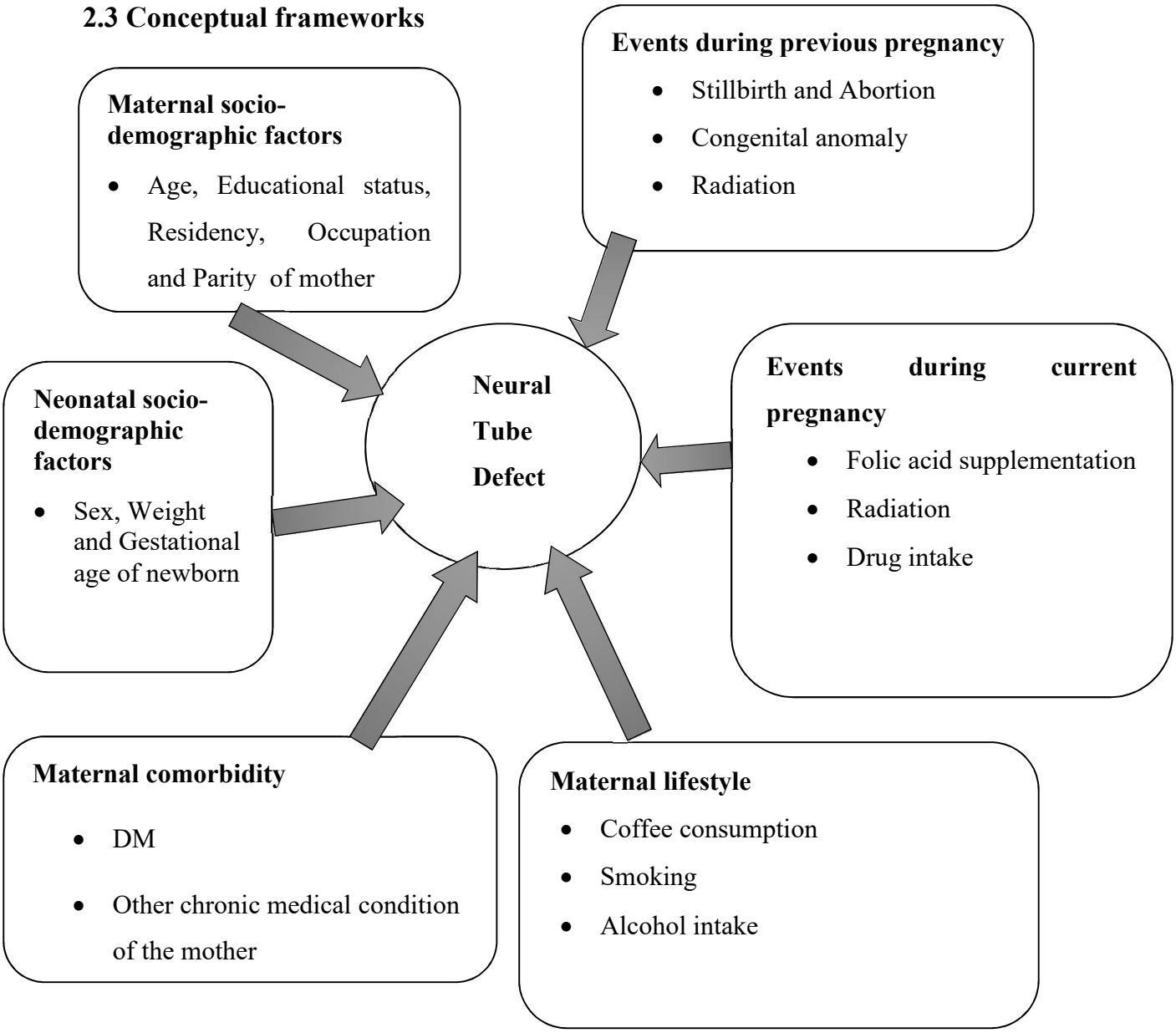

Figure 1: Conceptual framework showing factors associated with the magnitude of neural tube defect among neonates hospitalized to neonatal ICU at HFSUH (**source: different literature**).

3. Methods and materials

3.1. Study Area and period

A study will be conducted in HFSUH, which is found in Harari town, Harari region, Ethiopia. Harar is located 525km east of the capital city of Ethiopia, Addis Ababa. HFSUH is a university teaching hospital and is used as a referral hospital for eastern Ethiopia. The hospital has four major departments (medical, surgery, pediatrics and gynecology-obstetrics) and 6 minor departments (psychiatry, dental clinic, radiology unit, dermatology, ophthalmology, and chronic follow-up clinic visit). Department of Pediatrics has six units which include, the Pediatric Intensive Care Unit, ward, Nutritional Rehabilitation Unit, Neonatal Intensive care Unit, Outpatient Department and chronic follow up (Source: verbal communication with the hospital HMIS head)

This study will be conducted from December 15 to February 15, 2020

3.2. Study design

Hospital-based cross-sectional study will be used.

3.3.Population

3.3.1. Source population

All newborns admitted in neonatology unit and respective mothers at HFSUH during the study period

3.3.2. Study population

All newborns admitted in neonatology unit and respective mothers at HFSUH during the study period

3.4.Inclusion and exclusion criteria

3.4.1. Inclusion criteria

All newborns who will be admitted at the neonatology unit and respective mothers at HFSUH during the study period

3.4.2. Exclusion criteria

No one will be excluded

3.5.Sample size determination and sampling technique

3.5.1. Sample size determination

Single population proportion formula is used to calculate sample size by considering P= 0.09 from the previous study conducted in Bale **(**Atlaw *et al.*, 2019**)** at 95% confidence interval) and 5% of the degree of precision. The sample calculated with the following formula:

$N = \frac{z^2 p(1-p)}{d^2}$, where

N= minimal sample size required

z= 1.96 (normal deviate corresponding to 95% confidence interval)

d= degree of precision

P= proportion neural tube defects

Thus, $N = \frac{1.96^2 \times 0.09 \times 0.91}{(0.05)^2} = 126$

By adding 10% non-response rate, the final sample size will be 139 patients

For the second objective: Double population proportion formula will be used to determine the sample size. Accordingly, the Sample size will be calculated for some of the associated factors obtained from different works of literature by using the Stat calc of Open Epi statistical software version 2.3 with the following assumptions: Confidence level = 95%, Power = 80%, the ratio of unexposed to exposed almost equivalent to 1

Table 1. Sample size determinations using double population proportions for the study that will be conducted to assess the magnitude of the tubal defect and associated factors among neonates admitted to HFSUH neonatal ICU, 2019

Factors	**Tubal defect**		**Odds ratio**	**Non-response rate**	**Sample size**	**Reference**
	Exposed	**Non-exposed**				
Folic acid	232	230	0.11	10	95	Atlaw *et al*., 2019

supplementation during ANC –I						
Passive smoker during pregnancy	100	362	0.2	10	176	Atlaw *et al*., 2019.
Consanguinity	118	344	0.2	10%	152	Atlaw *et al*., 2019.
BMI during pregnancy	275	58	0.55	10%	420	Gedefaw *et al*., 2018

So, the maximum sample size considered for the study will be 420**.**

3.5.2. Sampling technique or procedure

Sampling will be done using a non-probability convenience sampling technique, in which all neonates and their respective mothers who are admitted to HFSUH neonatal unit during the study period will be included till the determined sample size will be fulfilled.

3.6. Data collection methods

3.6.1. Data collection tool and procedure

Data will be collected by face to face interview: by trained data collectors using a structured questionnaire which was adapted from previous literature (Atlaw *et al*, 2019; Omer *et al*, 2016; Uba *et al*, 2004; Paul *et al*, 2008; Motah *et al,* 2017) will be used. The questionnaire will be prepared first in English then translated into local languages (Amharic and Afan Oromo) and back to English for consistency by different language experts. The data collection instruments will be pre-tested before the actual data collection on 5% of the sample size in Jugal hospital and necessary amendment and corrections will be made. This questionnaire will be used to collect data from mothers about maternal and socio-demo graphic characteristics, labor and delivery related factors and clinical symptoms.

3.6.2. Data collector

We will employee two BSC nurses and one general practitioner medical doctor as a data collector and supervisor respectively.

3.7. Variables

3.7.1. Dependent variable

- The prevalence of neural tube defect

3.7.2. Independent variables

- Neonatal sociodemographic characteristics (sex, weight, gestational age)
- Maternal sociodemographic characteristics (age, educational status, residency, parity, monthly income)
- Events during Previous pregnancy(radiation exposure ,stillbirth, abortion, congenital anomaly)
- Events during current pregnancy(ANC visits, radiation exposure, drug intake, Folic acid supplementation)
- Maternal lifestyle (coffee and alcohol consumption)
- Co-morbid maternal illness (DM and other Chronic medical condition of the mother)

3.8 Operational definitions

Neonate: Regardless of gestational age, the newborn (neonatal) period begins at birth and includes the 1st month of life (Nelson Textbook of Pediatrics 21st edition.p1111)

Significant Caffeine intake: more than 3 cups/day (De Marco *et al*, 2011)

Alcohol intake during pregnancy: any amount and any time during pregnancy is dangerous for the baby (CDC: 2004)

Smoking: any amount and any time during pregnancy is dangerous for the baby (Australian government department of health, 2019)

3.9 Data quality control

The data collection tool will be pretested for its consistency, completeness and easy understandability. One day of training will be given for both the data collectors and supervisor. The data collection process will be closely monitored by the principal investigator to ensure the completeness, accuracy, and consistency of data collection, during sessions thorough checking will be done before analyzing the filled questionnaires. Double data entry will be conducted by two separate individuals. When any gap is identified, it will be communicated with data collectors daily.

3.10 Methods of data analysis

After data collection, each questionnaire will be checked serially for the completion of the data. The data will be coded and double entered into Epi Data version 4.1, transferred and analyzed using SPSS version 21.0 for analysis. A bivariate logistic regression analysis will be done to select the variables to be entered into the final logistic multivariable analysis**.** Explanatory variables with p value less than 0.20 in bivariate logistic regression analysis will be entered into the multivariate logistic regression analysis model and association between the independent variables and NTDs will be assessed using odd ratio at a 95% confidence interval. Every variable with P-values less than 0.05 in the multivariate logistic model will be considered as having a statistically significant.

3.11 Ethical Consideration

Before starting the data collection process, the study protocol will be approved by the College of Health and Medical Sciences the Institutional Research Ethics Review Committee (IRERC). Official letters of co-operation will be submitted to HFSUH and concerned bodies to obtain their co-operation and consent in facilitating the study. After getting informed ,voluntary, written and signed consent from the hospital head, information on the study will be explained to the participants, including the procedures, potential risks, and benefits of the study. The respondents will be informed of their right to refuse or decline participation in the study at any time and refusing to participate in the study will not affect them. Informed voluntary written and signed consent will be obtained from all respondents before the study. Participants' confidentiality of information will be assured by excluding names and identifiers in the questionnaire.

3.12 Expected outcome

There are different studies conducted worldwide, in Africa and Ethiopia on the assessment of the magnitude of NTDs and identification of associated factors, even though this all study was done in one or two hospitals. Still, this study shows high prevalence even worldwide which is worse in developing country like Africa. So from what was observed in our hospital in terms of care and patients factors, I will expect a high prevalence relative to the prevalence reported in different literature.

3.13 Information Dissemination

The study will be presented to Haramaya University, College of Health and Medical Science School of Medicine. The hard copy will be available in the library of Haramaya University,

College of Health and Medical Science for postgraduate students as well as for other concerned readers. The finding of this study will be disseminated through presentation, publication, and distribution to relevant bodies.

3.14 Limitation of the study

This possible limitation of the study is related to the study design nature i.e. cross-sectional nature of the study does not confirm definitive cause and effect relationship, and convenient sampling by itself has limitations.

4. WORK PLAN

Table 2: A work plan of Magnitude of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital, 2019

s.no	Activities	Responsible Bodies	A period in months 2019 to 2020									
			May	June	July	August	September	October	November	December	January 2020	February 2020
1	Topic selection and approval	PI and advisor										
2	Proposal development (1st draft)	PI										
3	Comment From advisor	Advisor										
4	Proposal Re development And comment Incorporation.	PI										
5	2nd comment and comment incorporation	PI and advisor										
6	Proposal defense	PI and examiner										
7	Approval of proposal by department and HU ethical committee	HU ethical review board and advisor										
8	Pre-test and correction of data collection format	PI										
9	Budget release and data collection											
10	data	PI										

	processing, clearing and enter into the computer											
11	Data analysis	PI										
12	Report writing (1st draft)	PI										
13	Comment, incorporation of comment and developing the final report	PI and advisor										
14	Research report (summary ppt and submission)	PI										
15	Mooch and the final defense	PI, advisor, and examiner										
16	Incorporation of final comments and final paper submission.	PI										

PI- principal investigators

4 Budget break down

Table 3: Budget break down of Magnitude of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital, 2019

A	**Itemized budget for stationary**				
S. No.	**Item**	**Unit**	**Cost**	**Quantity**	**Total cost**
1	Computer paper	Rim	105	3	315
2	Printing (color)	Copies	10br/page	6 copies x 6 pages	160
3	Photocopying different material	Pages	0.50br/page	2000	1000
4	Staples	Pack	4	5	20
5	Pencil sharpener	Piece	10	4	40
6	Rubber	Piece	9	2	18
7	Pen	Number	5	20	100
8	Pencil	Number	3	50	150
Sub-total cost					**1803**
B. Communication cost					
S. No.	**Service**	**Item**	**Cost**	**Quantity**	**Total cost**
1.	Communication with telephone	Mobile card	100	4	400
	Sub-total cost				**400**

C. Personal cost

C.1. For training

S.no	Participants	No of participant	Qualification	No days of training	Podium Rate	Total cost	Remark
1	Supervisor, PI	2	2General practitioner	1	171	342	

2	Data collectors	4	2 BSc Nurses	1	171	342	

C.2. For data collection and translator

S.no	Activities	Responsible personnel	Qualification	No.	Working Days	Perdiem Rate	Total	Remark
1	Translation	Translator		1	2	171	342	
2	Pretest	Investigator	Investigator	1	1day	198	171	
3	Data collection	Data collectors	2BSc pediatric nurse	2	60days (5days/wk.)	171	13680	
4	Supervisor, PI	General practitioner (GP)	General practitioner(GP)	1	60days (5days/wk.)	198	7920	
Sub-total						**22,797.0 ETB**		

D. Budget Summary

S. No.	**Activity**	**Budget in Birr**	**Remark**
1	Stationary cost	1803	
2	Communication cost	400	
3	Personal cost	**22797**	
Grand total		**25000.00 ETB**	

Budget required to conduct the study will be covered by Haramaya University post graduate directorate

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APPENDIXES

Appendix 1: Information Sheet and Informed voluntary Consent form for Hiwot-Fana Specialized University Hospital Administration

How are you?

My name is DR YUNUS EDRIS. I am a Pediatrics and Child Health student at the School of Graduate Studies in the College of Health and Medical Science of the Haramaya University. I am going to do my research for the partial fulfillment of the Clinical speciality certificate in Pediatrics and Child Health on the magnitude of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital. I kindly request you to lend me your attention to explain about this study.

The Study Title: The study title of my thesis prevalence of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital.

The purpose/Aim of the Study: The purpose of this study is to establish a local hospital based information on the prevalence of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital. The finding of this study will provide up-to-date information for the health professionals working in Hospital. Moreover, the main aim of this study is to write a thesis as a partial fulfillment of Clinical speciality certificate in Pediatrics and Child Health.

Procedure and Duration: The data collectors will interview the mothers in their first language using a questionnaire to provide me with pertinent data that is helpful for this study .there are 18 questions to answer. the interview on each mother will take about 20 minutes.

Risk and Benefit: The risk of participating in this study is very minimal, but only taking a few minutes of mothers time. I will not pay any direct cash for study participants for being participating in this study except facilitating their timely contact with neurosurgeon by early completion of pertinent investigations for the newborn and avoid unnecessary delay.

Confidentiality: Participant's information will be confidential. The finding of the study will be general for Neonates Admitted to Neonatology Unit and will not reflect anything about particular individual information. The questionnaire will be coded with a unique identification number to exclude showing names. No reference will be made in oral or written reports that could link participants in the study.

Rights: Participation for this study is fully voluntary.participants will have the right to refuse the participation or to answer any questions that they feel uncomfortable. They can also withdraw at

any time in the process. The decision not to participate or withdraw will not affect any aspects of the participants' future benefits from the hospital, social welfare and medical care need. You have, therefore, a full right to permit or not for this research to be done or not in this hospital. If you decide to permit you have again the right to stop the study any time without providing written or oral warning.

Contact Address: If you have any questions or inquiries about the study any time you can contact me by using my mobile phone number: 0945593004 / Dr. Yunus Edris and/or

E-mail: YUNED0945@gmail.com or the Institutional Health Research Ethics Review Committee of the College of Health and Medical Sciences using their office phone number: +251-254-662-011 or P.O.Box: 235, Harar, Ethiopia.

Declaration of Informed Voluntary Consent

I have read the participant information sheet. I have clearly understood the purpose of the study, the procedure, the risk and benefit of the study, and issues of confidentiality. The contact address was given to me for any queries. I have been given the opportunity to ask questions about things that have been unclear. I understand that participant has the right to withdraw from the study at any time or not to answer any question that they do not want. Therefore, I declare my voluntary on behalf of the Hospital Management to allow this study to be conducted in our Hospital with my signature.

Name of the Manager: _____Signature: _____ Date: ____/____/2019

Name of the data collector:----------Signature:----------Date:-------/------/20019

Appendix 2: English Version Participant Information Sheet and Informed Consent Form

Good morning/afternoon dear participant! My name is _____. I am working as a data collector for the study being conducted in this hospital on the magnitude of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital by Dr. Yunus Edris, who is studying his clinical speciality certificate at Haramaya University, College Of Health and Medical Science. I kindly request you to give me your attention to explain about the study and being selected as the study participant.

The study title: The prevalence of Neural Tube Defects and their associated factors among Neonates Admitted to Neonatology Unit, at Hiwot Fana Specialized University Hospital.

Purpose of the study: The aim of this study is to write a thesis as a partial fulfillment of a clinical speciality certificate program in Pediatrics and Child Health for the principal investigator. Moreover, the findings of this study can be important for this hospital to plan and implement activities that based on the outcome of the findings. It can also provide important information to policy makers, and program managers to address such issues in the future.

Risk and benefits: the risk of 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 of this study may reveal important information for the hospitals and health office to fill the gaps identified through this study.

Confidentiality: The information you provide for me 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 area 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 study.

Rights: Participation for this study is a fully voluntary. You have the right to declare to participate or not in the 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 which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: Contact address: If you have any questions about the study, the procedure or anything else related to the study, please contact through the following address:

Mobile phone of Principal investigator 0945593004 / Dr. Yunus Edris

Email address: YUNED0945@gmail.com

Institutional research ethics review committee (IRERC) Haramaya University:

Office phone: 0256661899: P.O.BOX: 235, Harar

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

Name of the participant: _____Signature: _____ Date: ____/____/2019

Name of the data collector:----------Signature:----------Date:-------/------/20019

N.B: This is to be signed face to face in the presence of data collector

Thank you for your cooperation!!

Appendix 3: English version of the questionnaire

I. **Sociodemographic and Maternal characteristic**

1. Age (in years)……..
2. Parity A. primiparous B. multiparous C. grand multipara
3. Spouses relation A. consanguineous B. Non-biologic
4. Residency A)Urban B)RURAL
5. Educational status A) Illiterate B) Able to write and read C) primary school (1-8th) grade D) Secondary school (9-10th) grade E) College and above
6. Estimated monthly income of the family in Ethiopian birr (…….)
7. Maternal drug intake during pregnancy (anti-Tb, AED) A) NO B B) Yes (specify……)
8. Do you drink coffee? A. YES (go to number 8 if yes) B.NO(skip number 8)
9. A. more than 3 cups per day B. less than 3cups per day
10. Maternal life style I. Alcohol consumption A. YES B.NO
    II. Active smoker A.YES B.NO
    III. Passive smoker A.YES B.NO
11. DM and other Chronic medical condition of mother A) NO B) Yes (specify……)
12. Radiation exposure during pregnancy A.YES B. NO
13. Occupation A) House wife B) Government C) private D. other (specify……)
14. ANC follow up place A) HFSUH B) Health center c) private D) Other governmental hospitals E. None F. other (specify……..)
15. Folic acid supplemented A)Yes(1st ,2nd ,3rd trimester) B)NO
16. Number of ANC visits A)none B) once C) twice and above
17. Previous still birth or Previous abortion A)YES B)NO
18. Previous baby with anomaly A) Yes(specify……) B) No

II. **Labor and delivery**

1. Mode of delivery A) SVD B) C/S C) Instrumental
2. Place of delivery A) Home B) HC C) HFSUH D) private clinic E) other specify……)

III .**Neonatal**

1. Age at presentation (in hours)……
2. Gestational ages (in weeks)……
3. Birth weight (in grams)…….
4. Sex A) Female B) Male
5. Physical examination at admission
   Head circumference in CM…….
   5.1.Anal tone A) normotonic B) loose
   5.2.MS/IS A). Size of the lesion (in CM)……..
   B) Site of lesion A .cervical B. thoracic C. lumbar D. Sacral E. other (specify……)

C) Description of observed spinal bifida A. Cystic B. Epithelialised C.purulent D. Other (specify……)

5.3. CNS

A) Moro- absent/complete/incomplete B) grasp-absent/weak/strong

C) Sucking -absent/weak/sustained D) Tone –normal/hypotonic/flaccid

Right upper=	Right lower=
Left upper=	Left lower=

E) Consciousness – hyper alert/alert/lethargic/comatose

F) Power A) <3/5 B)>3/5

Right upper=	Right lower=
Left upper=	Left lower=

G) DTR –normal/weak/absent

Right upper=	Right lower=
Left upper=	Left lower=

H. Sensation intact/lost

Right upper=	Right lower=
Left upper=	Left lower=
Anterior trunk=	Posterior trunk=

I) Credle test A) positive B) negative

6. Types of neural tube defect A.MMC B) Anencephaly C. Encephalocele D. Other (specify……..)
7. Associated anomaly A. hydrocephalus B. clubfoot C. other (specify……)
8. Investigation results A. transfontanelle U/S B. echo C. other (if it has findings)

IV Management

1. Surgical procedure (A. timing……

   B. types……)
2. Pre-op complication A) NO B Yes (specify……..)
3. Post-operative complication A.YES (specify……) B.NO
4. Duration of stay before discharge in days…….
5. Discharge outcome A)Death(cause……) B)same C)improved D)self-discharge E)disappeared

Data collector information: Name …….…….tell……

Appendix 4: Guca Odeeffannoo fi Walii galtee kan Hirmaattootaa (Afan Oromo version)

Maqaan kiyya.. ……. …….Amma kanin dalagaa jiru qorannoo hospitaala kana keessatti

Gageeffamuuf oddeeffannoo walitti guuree barataa Dr.yuunus idris yuunivarsiiti haramayaa keessatti

Yaala fayyaa daaimmanii irratti sartifikeetii ispeeshaalayzeeshinii ittin eebifamu fudhachuuf qorannoo

Gageessudha. Kanaafuu, isinis kanaan wal qabatee akkamitti hirmaataa akka taatanii fi ibsa akkan kennuuf Yeroo gabaaba akka naaf kennitan kabajaanin isin gaafadha .

1, Mata duree qorannoo

Hospitaala hiwoot faana ispeeshaalayzeeshinii yuunivaarsitii haramayaa keessatii kutaa

ispeeshaalayzeeshinii daaimman amma dhalatanii ciisanii yaalaman(daaimman ji`a tokkoo gadii) keessatti qorannoo dhibee ujummoo narvii waliin walqabatee bay`ina jiru hubachuudhaafi

2, karoora qorannoo: abbaa ykn baraticha qorannoo kana gageessuuf waraqaa qopheessuuf ni fayyada.

Dabalataanis qorannoon kun haadholee daaimmaniifi hirmaattotaf fayyidaa guddaa qaba

Akkasumas buu`aan qorannoo kanaa dhaabilee miti mootummaaafi seera baastootaaf taarkaanfii akka

fudhataaniif ni fayyada

3, adeemsa qorannoo fi yeroosa;

Qorannoo kanarratti hirmaachudhaaf yoo eeyyamamaa taatan guca walii galtee kana irraatti ni

Mallatteessitu akkasumas oddeeffannoo gahaa nuuf keennitu.baay`inni Gaafilee fi deebii lakkoofsaan

18. gaafi fi deebiidhaaf yeroon kenname daaqiiqa 20 . yeroo waan nuu kennitaniif galatooma.

4, faayyidaa fi miidha

Qorannoo kanarratti hirmaachuu dhaaf yeroo keessan yoo taate malee miidhan himamtu hin jirtu.

Hirmaachuu dhabuu dhanis wanti miidhamtan hin jiru, warren hirmaattaniifis kafaltiin kennemu hin jiru

garuu yoo hirmaatan beekumsa gara garaa ni argattu. akkasumas daaimman dhibee kanaan huubaman oggeessa baqaqsaa sammuu (neuro surgery) waliin walqunamsiisudhaaf.

Qaamoleen dhimmi ilaalatu garuu taarkaanfii fudhachuudhaaf carraa bareeda ta`aaf.

5, Iccitii eegu irratti ; oddeeffannoo nuuf keennitaniif iccittiin keessan sirritti eegama. Akkasumas

Dhimma dhuunfa dhan walqabatee gaaffiin ka`u hin jiru. Fakkeenyaaf maqaan keessan hin ka`u

6, mirga hirmaatan qabu ;

Qorannoo kana irratti hirmaachuu dhiisuu mirga ni qabdan. deebii kennuu dhiisuu dandeessu akkasumas Gaaffii isiniif hin galle gaafachuu ni dandeessu.

7, Teessoon;

Dhimma qorannoodhaan walqabate gaaffiin kaftan ykn waan isiniif hin galle yoo gafachuu barbaadan Teessoo armaan gadii fayyadamuu ni dandeessu :

Dr. yuunus Idriis lakk. Bilbilaa: +125-945593004 Email= YUNED0945@gmail.com

Yuunivarsitii haramayaatti dhaabata fayyaa fi qorannoo amala gaarii lakkoofsa komitee qorattootaa (025_666_18_99)

Lakk. Poostaa -235

8, Walii galtee eeyyamummaaratti hundaa`ee mirkana`ee

Guca oddeeffanoo irratti wanta barreeffame hubadheera. Karoorri qorannoo , fayyidaa fi buu`aa isaa Iccitii eegu irratti . rakkoolee hirmaachuu fi hirmaachuu dhabuun walqabatee eenyu akkan qunnamuu qabu hundinuu naaf ifa .gaaffii yoon qabaadhee akkan gaafadhu fi gidduudhaan ammo yoon dhaabuu barbaadde fi qorannoo ykn hirmannaa keessa baasuufi dhumma irratti gaaffii naaf hin taane eergaan hubadhee booda eeyyama kiyya irratti hunda`ee guutummaan guututti hirmaachuudhaaf murteessu kiyya mallattoo kiyyaanin mirkaneessa .

maqaa hirmaataa …….mallattoo……..guyyaa…….

maqaa guuraa oddeeffannoo……. mallattoo……..guyyaa…….

Appendix 5: Unkaa Odeeffannoon Ittiin Guurramu (Afaan oromo version questioner)

Haala Qubsumaa (Demography)

I. Kan Haadhaa

1. Umrii(Waggaadhaan) _____
2. Haala dahumsaa/dhalaa
   A. Tokko qofa kan dhalte
   B. Lamaa hanga shanii (2-5) kan dhalte
   C. Shanii (5)Ol kan dhalte
3. Jaarsaafi jaartiin firoomaa dhiigaa ni qabuu?. A.eyyee B lakkii
4. Bakka Jireenyaa
   A. Magaalaa
   B. Baadiyyaa
5. Haala Barnootaa
   A. Tasuma mana barumsaa kan hin seenne
   B. Sadarkaa 1ffaa (1-8)
   C. Sadarkaa 2ffaa(9-12)
   D. Barnoota Olaanaa
6. Galiin maatii baatiidhaan qarshii meeqatti tilmaamama?(_____)
7. Dawaa/Qoricha (tiibii ykn gaggabaaf)yeroo ulfaa fudhattee?
   A. Lakkii
   B. Eeyyee (Ibsa kenni/adda baasi)_____
8. Buna ni dhugdaa? A. eeyyee(gaaffii 8ffaas guuti) B.lakkii(gaaffii 9ffaa hin guutin)
9. A.Shiinii 3(sadii) ol dhuga B.shiinii 3(sadii)gadi dhuga
10. Haala jireenyaa yeroo ulfaa I.alkoolii ni dhugdii A.eeyee B.lakkii

II.tamboo ni dhugdii A.eeyee B.lakkii

III.kan biraa namni tamboo dhugu mana keessa jiraa

A.eeyee B.lakkii

11. Dhibee sukkaaraa fi dhibee kan biroo kan waggaa(amata) dheeraa (fakkeenyaaf gaggaba) turu ni qabdaa?.
    A. Lakkii
    B. Eeyyee (Adda Baasi)_____
12. Raadeeshiniif(raajii kauuf ykn akka dawaa kaanseriitti) A.eeyee B.lakkii
13. Hojii/Dalagaa haadhaa
    A. Haadha Warraa
    B. Hojjettuu Mootummaa
    C. Dalagaa Dhuunfaa
    D. Kan biraa (Adda Baasi)_____
14. Eessatti hordoffii ulfaa(Talaallii Ulfaa) godhatte?
    A. Caffee (Hiwoot Faanaa)
    B. Waajjira Fayyaa
    C. Kiliinika Dhuunfaa
    D. Hin Godhanne (deebii hin qabu)

Kan biraa (ibsi)_____

15. Foolik Asiidii(Kiniina)fudhattee?
    A. Eeyyee (Ulfa ji'a meeqaffaatti fudhatte?) _____
    B. Lakki
16. Yeroo meeqa hordoffiif Mana yaalaa deemte?
    A. Tasayyuu hin deemne
    B. Yeroo tokko (1)
    C. Yeroo Lamaa Ol (2 ol)
17. Kanaan dura uifi Yeroo malee sirraa ba'ee beekaa? yookiin du'aa deessee beektaa?
    A. Eeyyee
    B. Lakki
18. Kanaan dura ilmoo qaamni hir'uu deessee beektaa?
    A. Eeyyee(Hir'ina Akkamii?)_____

B. Lakki

II Haala Yeroo Da'umsaa Irratti

1. Karaa Da'umsaa
   A. Karuma qaama saalaa gargaarsa meeshaa malee
   B. Baqaqsaadhaan
   C. Sibiila yookiin meeshaan harkifamee
2. Bakka Da'umsaa
   A. Mana B. Buufata Fayyaa C. Caffee
   B. Kan Dhuunfaa
   C. Bakka Biraa (ibsi)_____

III .Gaaffilee haala mucaatiin wol-ilaallatan

1.umurii mucaa sa'aatiidhaan……

2.turtiin gadameessa keessaa torbaniin meeqa?.....

3.mucaan yeroo dhalatu ulfaatinni giraamaan?.....

4.saala mucaa A.dhalaa B.dhiira

Appendix 6. Amharic Version of Participant Information Sheet and Voluntary Consent Form

የአማርኛ ትርጉም የተሳታፊው መረጃ ቅጽ እና የተሳትፎ ስምምነት ማረጋገጫ

እንደምን አደሩ/ እንደምን ዋሉ?

ስሜ.................. እባላለሁ። አሁን እየሰራሁኝ ያለሁት በዚህ ሆስፒታል ከሚደረገው ጥናት መረጃ ሰብሳቢ ሆኜ ከ ከተማሪ ዶ/ር የኑስ ሲደሬስ በሀረማያ ዩኒቨርስቲ በህፃናት ሕክምና ስፔሻሊቲ ሰርቲፊኬት የመመረቂያ የሚሆን ጥናት ለማካሄድ ነው።ስለዚህ እንዴት ተሳታፊ መሆን እደምትችሉና ስለጥናቱ በተመለከተ ማብራሪያ እንድሰጥዎት የተወሰነ ጊዜ እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

1. የጥናቱ ርዕስ፡

በህይወት ፋና ስፔሻላይዝድ ዩኒቨርሲቲ ሆስፒታል ጨቅላ ህፃናት ክፍል ተኝቶ ከሚታከሙ ህፃናት ውስጥ የ ኒውሮል ትዩብ ዲፌክትና ተያያዥ ሁኔታዎች ብዛት ያለውን ምክንያት ማጥናት ነው።

2. የጥናቱ አላማ፡

የዚህ ጥናት አላማ በጥናት አጥኚው የስፔሻሊቲ ትምህርቱን ለማጠናቀቅና የመመረቂያ ጽሁፍ ለማዘጋጀት ይጠቅማል ። በተጨማሪ የጥናቱ ግኝት ለሆስፒታሉና በጥናቱ ውስጥ ለተሳተፉት የጨቅላ ህፃናት እናቶች ከፍተኛ ጠቀሜታ ይኖረዋል። የዚህ ምርምር ግኝቶች ከመንግስታዊ ያልሆኑ ድርጅቶች እና ከህግ አውጪዎች እርምጃ እንዲወሰዱ እና እቅድ እንዲያወጡ ይጠቅማል።

መኩሪያ ሺጸኤ ፣ ስልክ ቁጥር +251- 945593004 ፤ ኢሜል YUNED0945@gmail.com

ሀረማያ ዩኒቨርስቲ ተቋማዊ የጤና ምርምር ስነምግባር ግምገማ ኮሚቴ ስልክ ቁጥር 025-466-20-11፤

ፖ.ሳ.ቁ-235 ሀረር

8. በፈቃደኝነት ላይ የተመሠረተ የስምምነት ማረጋገጫ፡

የተሳታፊውን መረጃ ቅፅ አንብቤዋለሁ ወይም ተነቦልኛል።የጥናቱ አላማ ፤ያለዉን ጉዳት እና ጥቅም፤ ሚስጢር አጠባበቅ ፤የመሳተፍ እና ያለመሳተፍ መብት እንዲሁም ችግር ካለ ማንን ጋር ማግኘት እንዳለብኝ ሁሉ ተገልፆልኛል፤ ጥያቄ ካለኝ ደግሞ እንድጠይቅ እድል ተሰጥቶኛል በመሀል ደግሞ ጥናቱን ለማቆም ከፈለኩኝ በማንኛዉም ጊዜ ከጥናቱ/ ከተሳታፊነት/ መውጣት እደምችል በመጨረሻም መመለስ የማልፈልገውን ጥያቄ አለመመለስ መብቴ እንዳለኝ ከተረዳሁኝ በኋላ በሙሉፈቃደኝነት በዚህ ጥናት ለመሳተፍ የወሰንኩኝ መሆኔን ከዚህ በታች በተቀመጠው ፊርማዬ አረጋግጣለሁ።

የተሳታፊው ስም__________ ፊርማ__________ ቀን______________

የመረጃ ሰብሳቢ ስም___________ ፊርማ________________ቀን_________________

Appendix 7. Amharic Version of the questionnaire

1. ዕድሜ በ ዓመት----------

2. ከ 7 ወር በላይ የዘለቀ እርግዝና ብዛት ሀ. አንድ ለ. ከ 2 እስከ 5 ሐ ከ 5 በላይ

3. ጣምራዎቹ የ ስጋ ዝምድና አላቸው? ሀ.አዎ ለ የላቸዉም

4. የመኖሪያ ቦታ ሀ.ከተማ ለ. ገጠር

5. የትምህርት ደረጃ ሀ. የተማረች

ለ.ማንበብና መጻፍ የምትችል

ሐ.የመጀመሪያ ደረጃ ትምህርት የተማረች

መ. ሁለተኛ ደረጃ ትምህርት የተማረች

ሠ.ኮሌጅ/ዩኒቨርሲቲ

6. የ ወር ገቢ በ ግምት ስንት ብር ይሆናል? (.....)

7. በእርግዝና ወቅት የወሰዱት መሀኒት አለዎት(የ ቲቢ ወይም የሚጥል በሽታ)? ሀ. አዎ ለ.

የለም

8. ቡና ይጠጣሉ? ሀ. አዎ (9ኛ ጥያቀ ይሙሉ) ለ. የለም(9ኛ ጥያቀ ይለፉ)

9 ሀ(ከ 3 ሲኒ በላይ ጠጣለዉ) ለ(ከ 3 ሲኒ በታት ጠጣለዉ)

10 የአኗኗር ዘይቤ

7.1. አልኮል መጠጥ ይጠጣሉ? ሀ.አዎ ለ.አልጠጣም

7.2. ሲጋራ ያጨሳሉ? ሀ.አዎ ለ.አላጨስም

7.3.ባለቤትዎ ያጨሳሉ? ሀ.አዎ ለ.አያጨሱም

11 የስከር ወይም ሌሎች የረዥም ጊዜ በሽታ አለብዎት? ሀ.የለም ለ.አዎ(ያብራሩት.....)

12. በእርግዝና ወቅት ለጨረር ተጋልጠው ያውቃሉ? ሀ.አዎ ለ. አላውቅም

13. ስራ ሀ.የቤት እመቤት ለ.የመንግስት ሰራተኛ

ሐ.የግል/ መንግስታዊ ያልሆነ መ. ሌላ(ይጥቀሱ)

14. እርግዝና ወቅት ክትትልዎ የት ነበር? ሀ. ህይወት ፋና ስፔሻላይዝድ ሆስፒታል ለ.ጤና ጣቢያ

ሐ.የግል ሆስፒታል/ ከፍተኛ ክሊኒክ መ.ሌላ የህዝብ ሆሰፒታል
ሠ.አልነበረኝም ረ.ሌላ(ያብራሩጥ.....)

15. ፎሊክ አሲድ ኪኒን(ትንሽየ ቢጫ) ወስደዋል? ሀ አዎ ለ አልወሰድኩም

16. በእርግዝናዎ ወቅት ለስንት ዙር ክትትል አድርገዋል? ሀ.አልነበረኝም ለ.አንድ ጊዜ

ሐ.ሁለት እና ከዚያ በላይ

17. ውርጃ ወይም ህይወት የሌለው (ከማህጸን ውስጥ የጠፋ) ልጅ ወልደው ያዉቃሉ?

ሀ.አዎ ለ.አይደለም

18 ሰውነቱ ላይ የተፈትሮ ችግር ያለበት ልጅ ወልደው ያውቃሉ? ሀ አዎ ለ.አይደለም

II. የስነ ተዋልዶ ታሪክ

1. የወለዱት በምን ነበር? ሀ.በማኅፀን ለ.በኦፕሬሽን ሐ.በመሳሪያ

2. ልጆችትን የት ነዉ የወለዱት? ሀ.ቤት ለ.ጤና ጣቢያ ሐ.ህይወት ፋና ስፔሻላይዝድ

ሆስፒታል መ.የግል ክሊኒክ ሠ. ሌላ (ይጥቀሱ)

III. የጨቅላ ህጻን ሁኔታ

1. ዕድሜ(በሰዓታት).....

2. እርግዝናው የቆየው ጊዘ በ ሳምንታት.....

3. የተወለደበት ክብደት(በግራም).....

4. ጾታ ሀ. ሴት ለ.ወንድ

Appendix 8. Curriculum Vitae

1. Back ground information

Full name: Yunus Edris kelil

Sex: male

Date of birth: 1882E.C

Nationality: Ethiopian

Age: 30 years

Marital status: married

Address- Harar

Email: YUNED0945@gmal.com

Tell- 0945593004

2. Educational back ground

No	Name of school	Place	Grade	Year in E.C
1	Toba primary School	Toba Jimma	1- 8	1991-1998
2	Toba secondary School	Toba ,Jimma	9 – 10	1998-1999
3	Nekemt preparatory school	Nekemt ,East wollega	11- 12	2000-2001
4	Haramaya university	Harar ,Eastern Ethiopia	Medical doctor	2002-2008

3. Qualification

General practitioner (medical doctor)

4. Working Experiences

HiwotFana Special University Hospital as general practitioner in pediatric ward from 2008-2009

5. Language Skills

No	Language	Listening	Reading	Speaking	Writing
1	Afaan Oromo	Excellent	Excellent	Excellent	Excellent
2	English	Excellent	Excellent	Excellent	Excellent
3	Amharic	Excellent	Excellent	Excellent	Excellent
4	Arabic	Excellent	Excellent	Excellent	Excellent

6. References

Dr Fikirt (pediatrician,MPH) , HiwotFana Specialised University Hospital Staff.

Dr kerimo, HiwotFana Specialised University Hospital Staff.

Mr.Fuad Adem, Lecturer at Haramaya University School of pharmacy

Approval sheet
HARAMAYA UNIVERSITY
POST GRADUATE PROGRAM DIRECTORATE

Submitted by:

_____	_____	_____
Name of Student	Signature	Date

Approved by:

1. _____	_____	_____
Name of Major Advisor	Signature	Date
2. _____	_____	_____
Name of Co-Advisors	Signature	Date
3. _____	_____	_____
Research thematic area leader	Signature	Date
4. _____	_____	_____
Chairman, DGC/ SGS	Signature	Date
1. _____	_____	_____
PGPD	Signature	Date