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Neonatal Hypothermia And Associated Factors Among Newborn Admitted In Neonatal Intensive Care Unit Of Shegaw Motta General Hospital And Debre Markos Comprehensive Referral Hospital In East Gojjam Zone.

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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

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Neonatal Hypothermia And Associated Factors Among Newborn Admitted In Neonatal Intensive Care Unit Of Shegaw Motta General Hospital And Debre Markos Comprehensive Referral Hospital In East Gojjam Zone.

BY: Belete Ababu (BSC)

A THESIS SUBMITTED TO THE DEPARTMENT OF HEALTH SYSTEM MANAGEMENT & HEALTH ECONOMICS SCHOOL OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCE, BAHIR DAR UNIVERSITY, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH.

JULY, 2025

BAHIR DAR UNIVERSITY



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DEPARTMENT OF HEALTH SYSTEM MANAGEMENT & HEALTH ECONOMICS

NEONATAL HYPOTHERMIA AND ASSOCIATED FACTORS AMONG NEWBORN ADMITTED IN NEONATAL INTENSIVE CARE UNIT *OF SELECTED HOSPITALS IN EAST GOJJAM ZONE*.

BY: BELETE ABABU

Email: *beletefilfilu12@gmail.com*

ADVISOR:

Mrs. WUBALEM G/AMLAK (MPH)

Email: *wubie2001@gmail.com*

Mrs. MULUYE MOLLA (Mph, Assistant Professor of Health Economics)

Email: *mulumola6@gmail.com*

July, 2025

BAHIR DAR, UNIVERSITY

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LIST OF ACRONYMS AND ABBREVIATIONS

AGA	Appropriate for gestational age
ANC	Antenatal care
AOR	Adjusted odd ratio
APGAR	Appearance, Pulse, Gremmies, Activity, Respiration
BDU	Bahir Dar University
CI	Confidence Interval
CPR	Cardio pulmonary resuscitation
EDHS	Ethiopian Demographic Health Survey
LBW	Low birth weight
NICU	Neonatal intensive care unit
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

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ABSTRACT

Background: Worldwide, neonatal hypothermia is a concern and it plays a significant role in morbidity and mortality of newborns and also frequently associated with preterm birth & asphyxia particularly in underdeveloped nations. There is no such previous institutional based crossectional study. Therefore, this study aimed to assess neonatal hypothermia and associated factors among newborn admitted in neonatal intensive care unit of selected hospitals in east gojjam zone.

Objective: To assess neonatal hypothermia and associated factors among newborn admitted to NICU of selected hospitals in East Gojam Zone, 2024.

Methods: An institutional based cross sectional study was carried out from August 8 to September 30 2024. A total of 388 Neonates with their mother were selected by systematic random sampling technique at point of admission. Data was cleaned manually, coded and entered SPSS version 25 software computer for analyses.

Descriptive statistics was used for independent variables, binary logistic regression and multivariable logistic regression analyses were used to determine the presence of association. The odds ratio with a 95% confidence interval and a p-value of < 0.25 was used to multivariable analysis, also the p- value less than 0.05 used to determine the degree of relationship between the dependent and independent variables.

Result: The proportion of neonatal hypothermia was 63.4% with 95%CI, 58.47 - 68.06). low birth weight at birth (AOR = 1.71, 95% CI: 1.10, 2.67). Preterm at birth (AOR = 1.77, 95% CI: 1.10, 2.86) and Received CPR during birth (AOR = 3.12, 95% CI: 1.38, 7.01) had significant association with hypothermia.

Conclusion: Neonatal hypothermia in the study area was high. Low birth weights at birth, Preterm delivery and Received Cardiopulmonary resuscitation during birth were independent predictors of Neonatal hypothermia. Therefore, attention is needed improve basic routine practice such as warm environment, resuscitation and skin to skin contact by health care providers.

Keywords: Hypothermia, Proportion, Newborn, Neonatal intensive care unit of East Gojjam Zone.

1. INTRODUCTION

1.1. BACKGROUND

World Health Organization defined Neonatal hypothermia as an axillary temperature less than 36.5 °c. Reduction of thermal stability has a long-term physiologic effect that leads to death due to hypoxia and hypotension(1). Globally an estimated of four million newborns die within the first four weeks of life which accounts 2/3rd of all deaths in the first year of life and 40% of under five deaths. Most Neonatal deaths arise in low and middle-income countries (2).

Hypothermia is a common cause of neonatal morbidity and mortality, even in warmer tropical countries (3). Neonatal hypothermia is fastly recognized as a major determinant for new-born survival (4).

In hospitals, there is a substantial risk of primary hypothermia in the first 24 hours following birth. Primary hypothermia is an individual illness caused by cold stress. Neonatal hypothermia is a global burden with 28% of cases occurring in first world nations (5). Approximately four million infants worldwide pass away during the neonatal period which lasts to four weeks. This time accounts for 40% of deaths for children under five and more than 50% of all deaths during the first year of life. Around 50% of newborn deaths happen at home and the majorities occur in low and middle-income nations (5). From 300 neonates admitted to the neonatal unit, 49.5% developed hypothermia (6). The frequency of hypothermia was found to be significantly higher in low birth weight 58.1% and preterm 64.2 % babies (7). In third-world countries, the risk of neonatal hypothermia becomes six times greater than in first-world one (8). In third-world nations hypothermia was common in healthy full-term newborns with normal birth weights (4).

A global burden of neonatal hypothermia indicated that 53% of Ethiopian newborns developed hypothermia due to different sociodemographic, behavioral, physiological and birth context related factors. However, the significance of these factors along the spectrum of public health institutions in the study area hasn’t been yet studied (9, 10).

The incidence of primary hypothermia which is an independent morbidity as a result of cold stress is high immediately following birth in hospital setting especially in the first 24 hours. In developed countries neonatal hypothermia accounts for 28% of the global

burden (5). Hypothermia is a common cause of neonatal morbidity and mortality, even in warmer tropical countries (1). The premature newborn is more vulnerable due to both physical traits and environmental variables. The physical features include juvenile skin with little stratum carenum, a large head in relation to body, a thin layer of insulating subcutaneous fat, poor vasomotor control and a lack of non-shivering thermogenesis. Low surface temperatures of the beds used for resuscitation and admission as well as low ambient air temperatures in delivery rooms and Neonatal intensive care unit admission rooms are examples of environmental factors (18). It can be caused by a number of factors such as low birth weight, preterm, early baby bathing, delayed breastfeeding initiation, traditional oil massage of newborns, home delivery, lack of skin-to-skin contact with the mother and inadequate thermal care knowledge among health professionals.

WHO recommends prevent factors which can increase neonatal hypothermia like place of birth, prematurity, lack of antenatal care follow up, not early initiation breast feeding, not skin to skin contact with mothers. The purpose of this study is to determine the proportion of neonatal hypothermia and the factors associated with it in selected hospitals of east Gojam zone.

1.2. STATEMENT OF THE PROBLEM

Neonatal hypothermia and problems associated to the intrapartum process worldwide were the leading causes of neonatal fatalities (5). Newborns born at home and at various hospital levels are at risk which is a major health concern (13). After being admitted to the NICU, 34% of newborns suffered from hypothermia (14). In developed countries accounts for 28% of the global burden (17). From underdeveloped nations 10.7% of newborns had a temperature below 35.0°C and over 90% of neonates had hypothermia (less than 36.5°C) (3, 15). According to the study of in West African sub-region was 62% at the time of admission (16). It is a significant public health concern in Ethiopia, contributing to the high neonatal mortality rate in the country (11). The incidence of primary hypothermia which is an independent morbidity as a result of cold stress is high immediately following birth in hospital setting especially in the first 24 hours.

It increase newborn mortality rate, as reported in the 2016 EDHS report was 29/1000 live births. This number does not significantly differ from 37/1000 live births reported in the 2011 EDHS report. Based on 2019 EDHS, neonatal mortality rate in Ethiopia was 30

deaths per 1,000 live births, indicating the urgent need to address this issue (12). There was a 53.3–69.8% in Ethiopia as well (5).

Neonatal units, especially in developing countries, saw a significant increase in admissions and deaths due to this as a result of various factors that contributed to infant mortality (8).

In order to reduce neonatal mortality, world health organization has also suggested thermal care as part of critical newborn care, a package of fundamental interventions that should be provided to all neonates (2). Ethiopia follows the WHO's recommendation to avoid hypothermia by allowing the mother and child to have skin-to-skin contact as soon as possible after delivery (10).

It will increase the morbidity and mortality rate of the neonate if prompt care, particularly thermal therapy is not provided admitted (19). Understanding the prevalent risk factors for newborn hypothermia in the research area is crucial to preventing this issue.

Ethiopia applies the principle of skin-to-skin contact with the mother and Start breast feeding within the first hour after birth to prevent hypothermia that is recommended by WHO (7). If there was a delay in immediate new born care including thermal care & initiation of breast feeding, low birth weight, preterm and nighttime delivery, there will be a burden of this which increases the neonatal morbidity and mortality. To avoid this problem, knowledge about common risk factors like inadequate antenatal care follow up in the study area become essential. Therefore, the purpose of this study will used to determine the proportion of neonatal hypothermia and associated factors among new born admitted to Shegaw Motta General Hospital & Debre Markos comprehensive referral hospital, East Gojjam zone.

1.3. JUSTIFICATION AND SIGNIFICANCE OF THE STUDY

Neonatal hypothermia is a significant public health concern, particularly in developing countries like Ethiopia. Newborns are at a higher risk of developing hypothermia due to immature thermoregulatory mechanisms and exposure to cold environments during delivery and post-delivery care. Hypothermia in newborns can lead to various adverse health outcomes, including increased risk of morbidity and mortality, impaired growth and development. This study result will provide insight to health care provider in

identification of common risk factors of neonatal hypothermia and to overcome the challenge for management of neonatal hypothermia. The findings of this study will help for medical professionals and hospital managers to identify common risk factors & get past the difficulty of managing the condition and to plan necessary training program based on the result for health professionals which helps them to improve their knowledge regarding the neonatal hypothermia respectively.

The community will benefit from increased awareness since, in accordance with the results, mothers receiving antenatal care follow-up are educated by health experts about various risk factors and help to give recommendation to improve quality of new born care specifically thermal protection for nursing profession. And also help to inform the development of evidence-based strategies to improve newborn thermal care in the study setting and potentially in other similar contexts.

2. *LITERATURE REVIEW*

2.1. PROPORTION OF NEONATAL HYPOTHERMIA

Worldwide, the prevalence of neonatal hypothermia increased from 29% at 10 minutes after delivery to 79% at 90 minutes. Around the world, this problem also affects newborns born in homes (prevalence range: 11% to 92%) and hospitals (32% to 8(20).

According to a study done at the Leiden University Medical Center in the Netherlands of 80 newborns, 93% (74/80) experienced hypothermia during the first three hours of admission and 66% (61/80) of those cases lasted longerthan30minutes (21)

A study in Malaysian reported that out of the 3768 infants with admission temperature recorded, 64.8% (n=2440) were hypothermic: 40.3% (n=983) mildly (36.0–36.4C0), 58.5% (n=1428) moderately (32.0–35.9C0) and 1.2% (n=29) severely (<32.c0) (13).

According to an Iranian study, out of 900 neonates (452 men and 448 females), 298 (33.1%) had birth weights under 2500 g, and 323 (35.1%) were preterm (gestational age less than 37 weeks). 53.3% of newborns were hypothermic within an hour of birth followed by 13.6% upon NICU admission, 2.7% one hour after admission, 0.5% two hours after admission and 0.3% four hours after admission. When compared to newborns with normal APGAR rating the prevalence of mild, moderate and severe hypothermia was 11.2%, 0.4%, and 5.5% among low APGAR score infants respectively (23).

According to a research conducted in India, of the 100 infants admitted to the NICU, 43 (43.000%) were determined to be hypothermic upon admission; the majority of these cases were moderate cases with the other infants having normal body temperature (24).

A Nigerian study discovered a 62% incidence rate among 150 newborns admitted to hospitals in the West African sub region (25).

A study from Johannesburg, South Africa indicates that the prevalence of newborn hypothermia was 21% upon admission. Hypothermia is common throughout Africa but it is most common in sub-Saharan Africa (26).

A study from Tanzania, Manji and Kisenge reported an incidence of neonatal hypothermia was 22.4% among 1632 newborns on admission (22).

In a Ugandan metropolitan hospital 300 newborns were sequentially recruited day and night for a two-month period to participate in a descriptive research on neonatal hypothermia. Temperatures reading of the tympanic and rectal regions were taken

simultaneously 10, 30, 60, and 90 minutes after delivery. Rectal temperatures at 10, 30, 60, and 90 minutes revealed that 29%, 82%, 83%, and 79% of the babies were hypothermic respectively (14).

According to a hospital-based study conducted in Ethiopia, 53% of patients had hypothermia at admission (15).

A study done in Addis Ababa University show that the prevalence of neonatal hypothermia among new born admitted to NICU of Governmental Hospitals in Addis Ababa was 228 (64%). More than half of Neonates 184 (51.7%) was moderate hypothermic which is 80.7% among hypothermic babies that among neonates admitted in NICU 64% of them were hypothermic (4).

According to a research conducted at the teaching and referral hospital of Gondar University 294 (69.8%) of the 421 newborns had hypothermia (20).

2.2. ASSOCIATED FACTORS FOR NEONATAL HYPOTHERMIA

Neonatal factors

According to a study done at the Leiden University Medical Center in the Netherlands, there was still a significant correlation between gestational age and admission hypothermia. In comparison to the infants where this did not occur, the infants with moderate to severe hypothermia > 30 minutes after admission had a lower birth weight, a lower gestational age and a higher incidence of hypothermia at admission. Additionally, they were more likely to have umbilical lines placed to a lower degree of hypothermia (27). The only significant risk factors for admission hypothermia, according to a Malaysian study are birth weight, Appropriate gestational age, being inborn and major congenital anomalies being inborn and major congenital anomalies (28). A cross-sectional study conducted to in Iranian study, infants who were Low birth weight, preterm, had low APGAR scores, were from multiple pregnancies and were given Cardio pulmonary resuscitation were more likely to experience hypothermia. Neonatal hypothermia was significantly correlated with LBW, preterm or gestational age <37 weeks, low APGAR score; <8, receiving CPR, multiple pregnancies and low environmental temperature (29). A cross-sectional descriptive study conducted in Uganda

Nine out of 86 hypothermic neonates had low birth weight babies, while 9 out of 209 non-hypothermic newborns had same condition at 10 minutes (22).

A study conducted in India hypothermia was significantly associated with rainy and winter season. When hypothermia incidence was compared to gestational age in neonates who were 37 weeks or younger, it was discovered that the frequency of hypothermia was higher in infants under 37 weeks. This indicates a substantial positive link between hypothermia and lower gestational age. The incidence of hypothermia was shown to be higher in babies in the former group when they were classified as < 2500gms and > 2500gms. These findings suggest that hypothermia increases gradually as birth weight decreases (30). In Tanzanian study by Manji and Kisenge, low birth weight newborns have a greater thermal challenge than term normal birth weight infants, and there is a substantial correlation between birth weight and neonatal hypothermia. According to estimates, Low birth weight was found to be a significant risk factor for newborn hypothermia (21).

Additionally, neonates who received CPR at birth had a 3.6-fold increased risk of hypothermia compared to those who did not (24). According to a study conducted in the government hospitals in Addis Ababa, neonates less than 24 hours old had a twofold higher risk of hypothermia than those older than 24 hours. Based on the study resuscitation at birth was significantly associated with hypothermia (25). According to a research conducted at Bahir Dar town public hospitals with LBW and low APGAR score were determinant variables of the neonatal hypothermia(6). With a crossectional study of a research conducted at the teaching and referral hospital of Gondar University GA of < 37 weeks, APGAR score of < 7 and birth weight of $\underline{<}$ 2500 grams were significant associated with hypothermia (20).

Obstetrical factors

Obstetrical factors which include the mode of delivery where a neonate can be born by cesarean section, pregnancy type where the pregnancy can be multiple and being born from a mother who have had obstetrical complications during pregnancy. All these factors predispose a neonate to hypothermia as if they are present; they prevent the mother to adequately prepare her to prevent hypothermia to the neonate (8). According to a research conducted at Bahir Dar town public hospitals with nighttime delivery was determinant variables of the neonatal hypothermia (6).

Socio economic factors

Socio economic factors which are being born from non-experienced mother, maternal age where a mother could be an adolescent, family income where a mother can be from the low-income family, the parity of the mother where a mother can be a prim parity or multiparty, mother‘s occupation and mother‘s residence where a mother can be from the rural area. Those factors cannot cause neonatal hypothermia, but they can prevent the mother‘s way of managing the neonate‘s body temperature and maintaining it in the normal range (18).

A cross-sectional descriptive study conducted in Uganda revealed that the mother's age, parity, ethnicity, educational status, occupation and residence are all had some bearing on the risk factors for newborn hypothermia (22).

Adolescent mothers were encountered more often among mothers with neonatal hypothermia of the newborn than among non-hypothermic newborns (31).

Behavioral factors

Behavioral factors of neonate is family which are the application of oil and massaging the neonate, not practicing skin to skin contact with the mother, improper wrapping, being bathed before 24 hours and delay in initiation of breastfeeding. All these factors predispose the neonate to heat loss and lead to hypothermia (18). According to A cross-sectional descriptive study conducted in Uganda no body contact with their mother significantly associated with hypothermia (31). Those neonates who had no early initiation of breast feeding within one hour after birth and problems of the neonates were significantly associated with hypothermia (26). According to a study conducted in the government hospitals in Addis Ababa who did not had skin-to-skin contact with their mother right after delivery and did not early start breastfeeding within an hour of birth were significantly associated with hypothermia (27). According to a study conducted in the teaching and referral hospital of Gondar University, LBW and newborns that did not have skin-to-skin contact with their mother immediately after delivery were significantly associated with hypothermia (32). According to a study conducted in the government hospitals in Addis Ababa no skin to skin contact with their mother immediately after delivery and delayed initiation of breastfeeding were significantly associated with hypothermia (4).

According to a research conducted at Bahir Dar town public hospitals with lack skin to skin contact and delayed initiation of breast feeding were significantly associated with hypothermia (6).

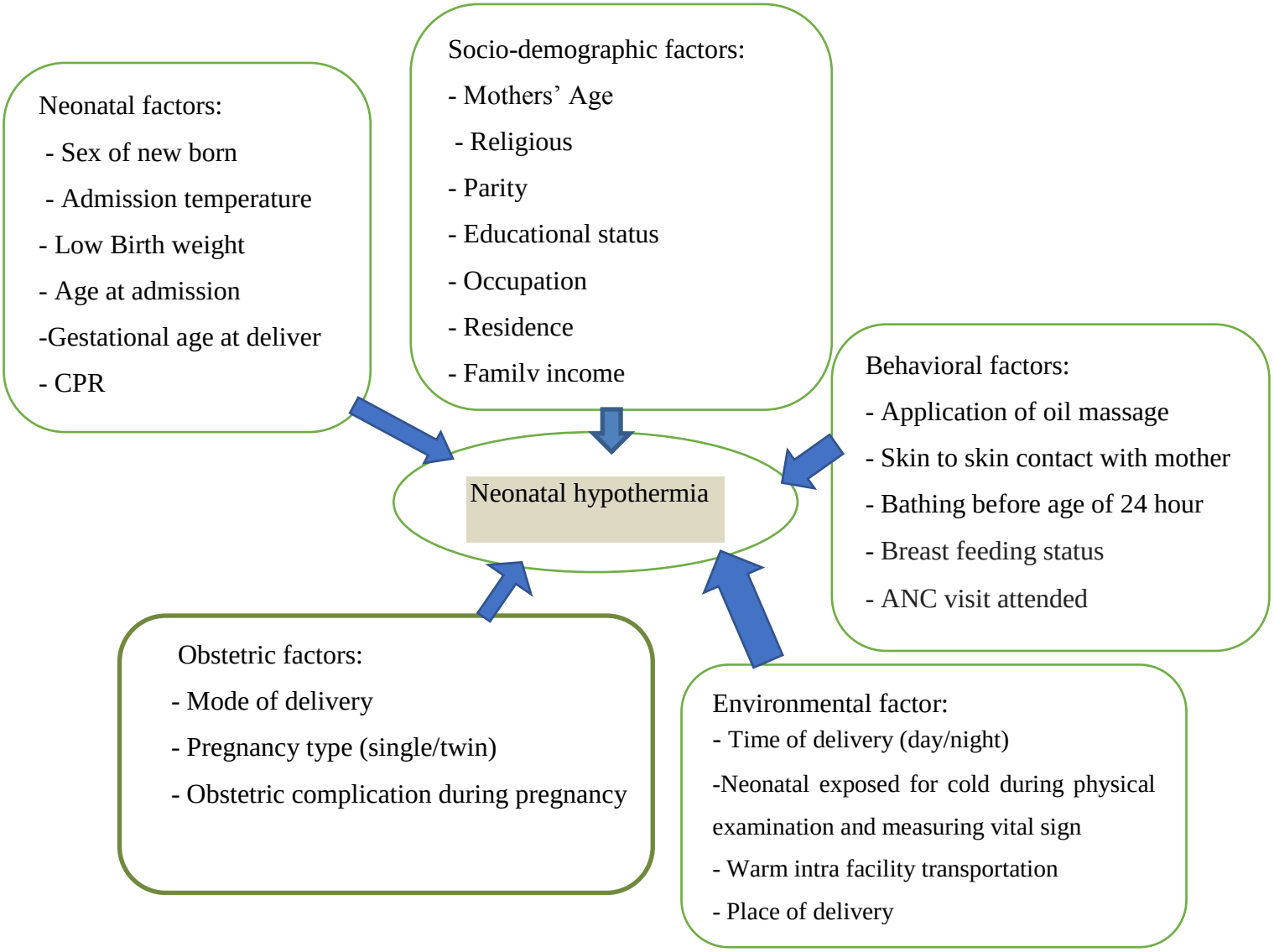
Environmental factors

The neonate‘s environmental factors which are the time of delivery where a neonate can be delivered at night, place of delivery where a neonate can be delivered at home or low resource setting, seasonal condition where a neonate can be born in cold season and room temperature. All these factors predispose a neonate to hypothermia as they reduce environmental temperature and lead to heat loss through conduction, convection and radiation mechanisms (18).

Those new born who were delivered during night time were significantly associated with hypothermia (26). According to a research conducted at Bahir Dar town public hospitals with nighttime delivery was significantly associated with hypothermia (6).

3. CONCEPTUAL FRAMEWORK OF THE STUDY

Conceptual framework adopted and designed according to the review of literature, based on Demise B. et al for the study of Neonatal hypothermia and associated factors among newborn admitted to NICU (4).



Source: Conceptual framework adopted and modified from Demise B. et al Conceptual framework (4).

Figure 1: Possible conceptual frame work of assess Neonatal hypothermia and associated factors among newborn admitted to NICU of selected hospital in East Gojjam Zone, 2024.

4. OBJECTIVES

General objective

- To assess Neonatal hypothermia and associated factors among newborn admitted to NICU of selected hospitals in East Gojam Zone, 2024.

Specific Objectives

- ✓ To determine proportion of Neonatal hypothermia among new born admitted to NICU of selected hospitals in East Gojam Zone, 2024.
- ✓ To identify factors associated with neonatal hypothermia among new born admitted to NICU of selected hospitals in East Gojam Zone, 2024.

5. METHODS

5.1. STUDY DESIGN AND PERIOD

Institutional based cross-sectional study was conducted from August 8 to September 30/2024.

5.2. STUDY AREA

The study was conducted in Shegaw Motta General Hospital and Debre Markos comprehensive referral hospital, from August 8 to September 30/2024. Motta and Debre Markos are located at a distance of 120 and 264 kilometers respectively from Bahir dar, the capital of Amhara Region. The average monthly admission rate to Shegaw Motta General Hospital and Debre Markos comprehensive referral hospital NICU ward were 315 and 527 neonates, respectively. Shegaw Motta General Hospital and Debre Markos comprehensive referral hospital had about 318 and 1012 workers respectively and gives antenatal, delivery and postnatal care services for about 12300 and 20150 mothers in a year respectively; according to the data obtained from the hospital's human resource management office and the delivery ward registration book of 2015 E.C respectively.

They had also about 12 and 28 health professionals who work in NICU and gave neonatal intensive care for about 2580 and 5124 neonates in a year respectively.

5.3. SOURCE POPULATION AND STUDY POPULATION

5.3.1. Source population

All neonates who were admitted to NICU ward in Shegaw Motta general hospital and Debre Markos comprehensive referral hospital.

5.3.2. Study *population*

All neonates admitted to the two hospitals from August 8 to September 30/2024.

5.4. ELIGIBILITY CRITERIA

Inclusion criteria

- All newborns admitted to NICU in selected hospitals during the study period.
- Newborns whose parents or guardians provided informed consent for participation in the study.

Exclusion Criteria

Neonates whose mothers were not present at all or died during the study period.

5.5. VARIABLES

Dependent Variable

Neonatal hypothermia (Yes /No)

Independent variables

- Socio-demographic factors**:** Age of the mother (years), Religion, Residence, Educational status, Parity, Maternal occupation and Family monthly income.
- Neonatal factors**:** Birth weight, Sex, Age at admission, Gestational age at delivered, Presence of birth asphyxia at delivery/need for resuscitation.
- Obstetric factors**:** Mode of delivery, Pregnancy type (single/twin), Obstetric complication during pregnancy.
- Behavioral factors**:** Application of oil massage, ANC visit attended, Skin-to-skin contact, Breast feeding status & Bathing before age of 24 hour.
- Environmental factors**:** Place of delivery, Neonatal exposed for cold during physical examination and measuring vital sign, Warm during intra facility transportation & time of delivery (daytime vs nighttime).

5.6. OPERATIONAL DEFINITION & TERM DEFINITION

- ✓ Neonate**:** is an infant under 28 days of age (24).
- ✓ Admission temperature**:** The first temperature obtained from neonates at admission to NICU(9).
- ✓ Hypothermia: The state of having body temperature below the normal range, an axillary temperature measurement below 36.5 $^{0}_{c}$ (33).
- ✓ Low birth weight (LBW): Birth weight less than 2500 grams(21).
- ✓ Term: Gestational age from 37 to less than 42 completed weeks.
- ✓ Preterm: Gestational age of less than 37 completed weeks (10).
- ✓ Day time: It is the time after sunrise and before sunset. (Time from 6:00 AM to 6:00 PM).
- ✓ Night time: It is the time between evening and morning or the time of darkness. (Time from 6:01 am to 5: 59 am)(8).

5.7. SAMPLE SIZE AND SAMPLING METHODS

5.7.1. Sample size determination

Single population proportion formula and epi info were used to estimate the sample size and the study conducted in Addis Ababa University, using proportion of 64% (p=0.64) (4).

Therefore, $n = \frac{(Z\alpha/2)^2 p(1-p)}{d^2}$ $n = \frac{(1.96)2\ 0.64\ (1-0.64)}{(0.05)^2} = 353$

Where:

n= minimum sample size

Zα/2=1.96 at 95% confidence interval

p = proportion of neonatal hypothermia (0.64%)

Z = standard normal distribution curve value for the 95% confidence interval (1.96)

d = the margin of error or accepted error (0.05)

Also the sample size was calculated by factors from two different study areas which were done on similar title with our topic. During calculated by epi info, with used of power 80, CI= 95%, show bellow.

Table 1: Sample size calculation

Variables	Prevalence	CI	Power	AOR	Sample size	Total with 10%
No early breast feeding	58.3	95	80	2.24	248	273 (6)
GA < 37 weeks	76.7	95	80	4.81	150	165 (4)
Prevalence of hypothermia	64	95	-	-	353	388

So Based on the above table the final sample size will be the largest one which is 388.

5.8. SAMPLING PROCEDURES AND METHODS

There were a total of eleven Hospitals in East Gojjam of Amhara Region that had their own organized NICU ward and the two Hospitals were selected using simple random sampling Technique. And they had a total average number of neonatal admitted per

month was 842 (Shegaw Motta and Debre Markos Hospitals) and a total sample size was 388. Then Neonates with their mother were selected by using systematic random sampling technique (K = 2.17), that is every two admission from the registration until the required sample size was obtained. The number of neonates surveyed from each Hospital was allocated proportionally to the total average number of admission per month from two Hospitals.

5.8.1. Data collection tool and procedure

Data collection tool was adopted from study done at Addis Ababa University (4). An interviewer administered, well-structured and close-ended questionnaire was used to collect maternal socio-demographic characteristics, neonatal, behavioral, health facility and environmental factors. Moreover, a checklist was used to obtain factors including maternal obstetric complications, neonatal age, birth weight, and gestational age at birth, mode of delivery, time of delivery, Apgar score, resuscitation history, neonatal health problems and CPR history was collected from the chart of the newborn. Also Axillary temperature of the new born was measured for 3 minutes by using digital thermometer.

Data collection was done by three BSc midwifes and one public health officer after they taken two-days training, about the objective of the study and how to fill the questionnaires, data collection tools and procedures. Finally record review was undertaken to get data on diagnosis, weight & temperature of the new born neonates.

5.8.2. Data management and analysis

The collected data was entered using SPSS version 25 software for analysis and then data was cleaned and categorical variables was labeled prior to data analysis. After data collection, it was edited, cleaned, coded and entered by using SPSS version 25 computer program. After entering the data to the software descriptive statistics was used to calculate the result in proportion, frequencies, cross tabulation & tables were used to present the result. A bivariate binary logistic regression was used to identify candidate variables for the final model (Binary and multivariable logistic regression) at p - value <0.25. Finally the independent predictors or variables which have significant association will be identified by using multivariate binary logistic regressions. The cut point to

declare the presence of an association between the dependent and independent variable is p – value < 0.05, and then it was done assumption test by Hosmier and Lemshow.

5.8.3. Data Quality Control

The quality of the data was being assured by: The data collection tool was translated to the local language (Amharic) to make the questions easily understandable and it was re-translated back to the English language to evaluate its consistency.

Two days training was given for the data collectors and supervisors focusing on the questionnaire content to ensure consistency of data, obtaining consent, privacy issues, personal relation and ethics in research.

Pretest was carried out at Shegaw Motta General Hospital on 5% of the sample size (20 participants) and correction was undertaken before the actual data collection time.

5.8.4. Ethical consideration

Ethical clearance and approval was obtained from the Ethical Review Committee of BDU, College of medicine and health science school of public health, Bahir Dar University. Then, letter from the Research Ethics Committee was submitted to selected hospitals.

After getting permission from selected hospitals, then informed verbal consent was sought from all study participants. The collected data was kept in the form of file in secured place.

Finally the data of any patient was not used for another purpose other than for the aim of the study.

5.8.5. Dissemination of result

Firstly the result will be submitted and presented to BDU College of medicine and health science school of public health, Health system management & health economics department.

The study result will be disseminated through BDU website, BDU library, Shegaw Motta General Hospital, Debre Markos comprehensive referral hospital, Amhara Regional Health Bureau maternal and child health service office and international Journals.

Then the efforts will be made to present the result on scientific conferences, workshops and publication on peer reviewed journals.

6. RESULT

Socio-demographic characteristics of the study participants

A total of 388 mothers with their neonates were included in the study with a 100% response rate. The mean maternal age was 32 years and more than half of the mothers 225(57.99%) were in the age group between 30 and 40 years of age. According to religion, 220 (56.7%) were orthodox followers and 314 (80.93%) had urban residents, 139 (35%) had a Secondary in educational level, About 101 (26.03%) respondents were Private worker and 262 (67.5%) had a monthly Income (see table 2).

Table 2: Socio-demographic characteristics of participants in Shegaw Motta and Debre Markos hospital, east Gojam zone, Ethiopia; 2025 (N= 388).

Variable	Categories	Outcome		Total frequency	Percent (%)
		Hypothermia	Non-hypothermia		
Age Of mothers	<20	9 (100%)	0 (0%)	9	2.32
	20-29	83 (64.34%)	46 (35.66%)	129	33.25
	30-40	134 (59.56%)	91 (40.44%)	225	57.99
	>= 40	20 (80%)	5 (20%)	25	6.44
Religious	Orthodox	136 (61.82%)	84 (38.18%)	220	56.7
	Protestant	25 (73.53%)	9 (26.47%)	34	8.76
	Muslim	85(63.43%)	49 (36.57%)	134	34.54
Residence	Urban	194 (61.78%)	120 (38.22%)	314	80.93
	Rural	52 (70.27%)	22 929.730	74	19.07
Education	unable to read and write	34 (68%)	16 (32%)	50	12
	Primary	56 (57.73%)	41 (42.27%)	97	25

	Education				
	Secondary education	83 (59.71%)	56 (40.29)	139	35
	Diploma and above	73 (71.57%)	29 (28.43%R)	102	26
Occupation of mother	House-wife	65 (50.78%)	63 (49.22%)	128	32.99
	Employee	68 (68%)	32 (32%)	100	25.77
	Private worker	74 (73.27%)	27 (26.73%)	101	26.03
	Student	12 (57.14%)	9 (42.86%)	21	5.41
	Farmer	27 (71.05)	11 (28.95)	38	9.79
Income	≤ 2000	3(100%)	0(0%)	3	0.77
	2001-5000	80 (65.04%)	43 (34.96%)	123	31.7
	≥5001	163 (62.21%)	99 (37.79)	262	67.53
Number of child birth	Only one	67 (60.91%)	43(39.09%)	110	28.35
	Two or more	179 (64.39%)	99 (35.61%)	278	71.65
Place of Delivery	In born	187 (63.61%)	107 (36.39%)	294	75.77
	Out born	59 (62.77%)	32 (37.23%)	94	24.23
Setting for out born delivery	Other hospital	3 (33.33%)	6 (66.67%)	9	9.18
	Health center	56 (62.92%)	33 (37.08%)	89	90.82

Neonatal characteristics

Majority of Neonates were female 202 (52.06%) and most of the neonates 337 (86.86 %) were in the age group of ≥24 hrs. while the average birth weight was 2911(SD = 422.1) Moreover, the average gestational age at delivery was 37.5 (SD = 1.19) weeks.

Those newborns were also assessed for CPR during birth and showed that of the total 49 (12.63) were received CPR. (see table 3).

Table 3: Neonatal Factors of Neonatal Hypothermia among Newborns admitted to Neonatal Intensive Care Units in Shegaw Motta and Debre Markos Hospitals, East Gojam zone, Northwest Amhara, Ethiopia; 2025 (N= 388)

Variable	Categories	Outcome		Total frequency	Percent
Sex of Neonate	Male	117 (62.9%)	69 (37.1%)	186	47.94
	Female	129 (63.86%)	73 (36.14 %)	202	52.06
Age of Neonate (in hrs)	<2 4 hr.	43 (84.31%)	8 (15.69%)	51	13.14
	≥ 24 hr.	203 (60.24%)	134 (39.76%)	337	86.86
Birth-weight in gram	< 2500	159 (69.13%)	71 (30.87%)	230	59.28
	≥ 2500	87 (55.06)	71 (44.94%)	158	40.72
Gestation in Weeks	<37	103 (72.03%)	40 (27.97%)	143	36.86
	≥37	143 (58.37%)	102 (41.63%)	245	63.14
Receive CPR during birth	Yes	41(83.67%)	8 (16.63%)	49	12.63
	No	205 (60.47%)	134 (39.53%)	339	87.37

Behavioral Characteristics Neonatal hypothermia

About 79 (20.36%) of neonates had Bathing before 24 hours and About 37 (9.54%) neonates was apply ointment immediately after birth, only 113 (29.12%) of neonates did not initiation of breastfeeding within 1 h of birth. most of the neonates 341 (87.8%) did no Exposed to cold by health professional during care. Moreover, 130 (33.51%) weren't made in contact with their mother's skin (see table 4)

Table 4: Behavioral Factors of Neonatal Hypothermia among newborns admitted to Neonatal Intensive Care Units in Shegaw Motta and debre markos hospital, east Gojam zone, Northwest Amhara, Ethiopia; 2025 (N= 388)

Variable	Categories	Outcome		Total frequency	Percent (%)
		Hypothermia	Non hypothermia		
Bathing before 24 hours	Yes	35(44.3%)	44 (55.7%)	79	20.36
	No	211 (68.28%)	98 (31.72%)	309	79.64
Apply ointment immediately after birth	Yes	21 (56.76%)	16 (43.24%)	37	9.54
	No	225 (64.1%)	126 (35.9%)	351	90.46
Start breast feeding within 1 hr.	Yes	180 (65.45%)	95 (34.55%)	275	70.88
	No	66 (58.41%)	47 (41.59%)	113	29.12
Exposed to cold by health professional during care	Yes	39 (82.98%)	8 (17.02%)	47	12.11
	No	207 (60.7%)	134 (39.3%)	341	87.89
Ways of prevention during travel	Yes	9 (56.25%)	7 (43.75%)	16	4.12
	No	237 (63.71%)	135 (36.29%)	372	95.88
Skin to skin contact immediately after birth	Yes	169 (65.5%)	89 (34.5%)	258	66.49
	No	77 (59.23%)	53 (40.77%)	130	33.51

Obstetrics and Environmental Characteristics

There were 341 (87.89%) of the newborns were born to mothers who had antenatal care, about 54 (13.92) of neonates had an obstetric complication during pregnancy. Most of the pregnancies 349 (89.95%) were single. 229 (59.02%) were delivered by SVD, 79 (20.36 %) were delivered by C/S, and only 80 (20.62%) were delivered via instrumental delivery. half of the neonates were born during the daytime, 195 (50.26%).

Table 5: Obstetrics and Environmental Factors of Neonatal Hypothermia among Newborns admitted to Neonatal Intensive Care Units in Shegaw Motta and Debre Markos Hospital, East Gojam zone, Northwest Amhara, Ethiopia; 2025 (N= 388)

Variable	Categories	Outcome		Total frequency	Percent (%)
		Hypothermia	Non-hypothermia		
ANC	Yes	217 (63.64 %)	124 (36.36 %)	341	87.89
	No	29 (61.7%)	18 (38.3%)	47	12.11
No of ANC	1-4	191 (61.41%)	120 (38.59%)	311	91.2
	5-8	26 (86.67%)	4 (13.33%)	30	8.8
Complicationduring	Yes	30 (55.56%)	24 (44.44%)	54	13.92
Pregnancy	No	216 (64.67%)	118 (35.33%)	334	86.08
Mode of Delivery	SVD	151 (65.94%)	78 (34.06%)	229	59.02
	Instrumental	50 (62.5%)	30(37.5%)	80	20.62
	C/S	45 (56.96%)	34 (43.04%)	79	20.36
Pregnancy type	Single	218 (62.46%)	131 (37.54%)	349	89.95
	Twin	28 (71.79%)	11 (28.21%)	39	10.05
Time of delivery	Day	118 (60.51%)	77 (39.49%)	195	50.26
	Night	128 (66.32%)	65 (33.68%)	193	49.74

Proportion of Neonatal Hypothermia

The Proportion of newborn hypothermia among newborns in Motta and Debre-Markos Hospital were 246 (63.4%) with (95%CI, 58.47 - 68.06). And the mean and SD of axillary temperature were 36.2 and ±.458 °C.

Factors Associated with Neonatal Hypothermia

During multivariable analysis, to determine the association of independent variables with hypothermia, both bivariable and multivariable logistic regression analyses were done. Factors which were associated with the occurrence of hypothermia were Mode of delivery, Birth-weight, Gestational age, Cardiopulmonary resuscitation given after birth, initiation of breastfeeding within one hour of deliver and Bathing showed association with (p value < 0.25). Then those variables which are significant on bivariate analysis were entered to multiple logistic regressions to identify independent predictors.

Accordingly, newborn that had low birth weight were 1.71 times more likely to be hypothermic when compared to those who have normal birth weight (AOR = 1.71, 95% CI: 1.10, 2.67). (AOR = 3.57, 95% CI: 2.15, 5.93).

The study also found that Preterm newborns was another important factor of hypothermia, Being preterm newborns were 1.77 times more likely to develop hypothermia when compared to term Neonates (AOR = 1.77, 95% CI: 1.10, 2.86). And Neonates who had resuscitation at birth (CPR) were 3.12 times more likely to be hypothermic when compared to those who had no resuscitation (AOR = 3.12, 95% CI: 1.38, 7.01). (Table 6).

Table 6 bivariable and multivariable regression neonatal hypothermia and associated factors among newborn

Variable	Categories	Hypothermia		COR (95%CI)	P-value	AOR (95%)
		Yes	No			
Mode of delivery	SVD	151	78	1		1
	Instrumental	50	30	0.86 (0.50-1.46)	0.579	1.07 (0.61 - 1.87)
	C/S	45	34	0.68 (0.40 - 1.15)	0.154	0.71 (0.40 - 1.24)
Birth-weight (gm.)	< 2500	159	71	1.83 (1.20 - 2.78)	0.005	**1.71 (1.10 - 2.67) ***
	≥ 2500	87	71	1		1
Gestational age (wk.)	< 37	103	40	1.84 (1.17 - 2.86)	0.007	**1.77 (1.10 - 2.86)***
	≥ 37	143	102	1		1
CPR	Yes	41	8	3.35 (1.52 - 7.36)	0.003	**3.12 (1.38 - 7.01)***
	No	205	134	1		1
Breast feeding	Yes	180	95	1.35 (0.86 - 2.11)	0.191	1
	No	66	47	1		0.64 (0.40 - 1.03)
Bathing	Yes	35	44	2.59 (0.96 - 6.95)		0.44 (0.15 - 1.22)
	No	211	98	1		1

7. Discussion

In this study we found to be that the proportion of newborn hypothermia among admitted newborns was 246 (63.4%) with (95%CI, 58.47 - 68.06). The proportion of this study is almost similar to the findings of the study conducted in Harare (66.3%), Addis Ababa, (64%), and Northwest Amhara referral hospitals (61.5%) (34-36). But, it was lower than studies conducted in Ghana (85.8%), Zimbabwe (80.3%) and Gondar (69.8%) (37-39), In contrary, the prevalence of this study is higher than a study conducted in Southwest Ethiopia (50.3%) and Pokhara (42.8) (40, 41).

Generally, the possible explanation for the variation in the study findings between these studies could be due to the differences in the study design, the temperature measuring device, the temperature measurement site, the weather condition, the educational level, and the ecological and sociocultural factors of the study sites. Supported by a study done in different countries (34-37, 41).

Accordingly, newborn that had low birth weight were 1.71 times more likely to be hypothermic when compared to those who have normal birth weight. This study is in line with a study done in Kenya (42) Uganda (43) and Bahirdar (44). The possible explanation may be due to the fact that newborns with small weight have large surface area per unit of body weight which makes them prone to develop hypothermia. The other explanation is that new born with low birth weights have less brown fat and less subcutaneous fat, which results in less heat insulation, decreased ability to breastfeed effectively lead to inadequate nutrition intake, poor weight gain, increased risk of hypothermia , and potential developmental delays(45-47).

This study also showed that preterm newborns were 1.77 times more likely to have hypothermia when compared to term Neonates. This finding is almost consistent with studies done in Harare (35), Addis Ababa (34) and Kenya (42). The reason may be preterm infants are physiologically at higher risk for developing hypothermia due to thinner and more immature skin that increases heat loss through radiation, a diminished adipose brown tissue in preterm birth neonate might decrease thermal insulation and cause quick loose of water. (35, 37, 45, 47)

Neonates who had resuscitation at birth were 3.12 times more likely to be hypothermic when compared to those who had no resuscitation This is due to the fact that Neonates who need resuscitation are those who had birth asphyxia; there is no enough oxygen which is needed for mitochondrial oxidation in the brown adipose tissue, for heat production. And during resuscitation at birth temperature control may not be properly taken care of; during emergency condition resuscitation may be done without wrapping the baby and in cold table (34, 48). This variation may be due to the difference in thermal care practice during resuscitation, warm resuscitation or not and difference in time of resuscitation.

8. Strength and Limitation of the study

8.1 Strength

The Strength is since the data collection was undertaken by professional health workers who had experience in maternal health services the quality of the data was believed to be good.

The major strength of the study goes with using both primary and secondary data according to the quality of data needed.

8.2 Limitation

It was done in one season so factors like climatic changes or seasonal variations were not addressed.

9. Conclusion

The proportion of neonatal hypothermia in the study area was relatively higher than previous studies. Those who had low birth weight at birth, preterm at birth and received CPR during birth were significantly associated with neonatal hypothermia.

10. Recommendations

For maternity and neonatal health care providers

Attention is needed for maintaining a warm environment, immediate drying and placing them in a polyethylene bag (for preterm infants). Warm resuscitation efforts, including skin-to-skin contact and early breastfeeding, will be practice. Regularly monitor the Neonate's temperature, especially during resuscitation and intervene promptly if hypothermia develops. Mothers should also be oriented of thermal care during their antenatal care, while they are in postnatal unit.

For the public health institutions

Each delivery room should have a humidity control system and practice warm resuscitation, immediate and sustained skin-to-skin contact and early breastfeeding. The temperature of each newborn should be taken as soon as possible after delivery and then every 10 to 15 minutes after that. Ensure healthcare providers are trained on the importance of thermal care and the "warm chain" practices.

For researchers

Considering the impact of seasonal variations and the need for follow-up studies with qualitative data can provide a more comprehensive understanding seasonal change on newborns with low birth weight, preterm newborns and neonates who received CPR during birth.

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12. ANNEXES

INFORMATION SHEET AND CONSENT FORM

Introduction: Hello, how are you? My name is _____. I am working as data collector in a survey conducted by Belete Ababu at Debre Markos comprehensive referral hospital / Shegaw Motta General Hospital. The research is amid to assess hypothermia and its associated factors among Neonatal newborns admitted to NICU at Debre Markos comprehensive referral hospital & Shegaw Motta General Hospital in East Gojjam Zone, 2024. You are invited to participate in this study and I kindly request your active involvement in this survey in order to provide me the necessary information. So thank you for your contribution.

Study topic- Hypothermia and its associated factors among Neonatal newborns admitted to NICU ward of selected two Hospitals in East Gojjam Zone, 2024.

Objective of the study- To assess hypothermia and its associated factors among Neonatal newborns admitted to NICU of selected two Hospitals in East Gojjam Zone, 2024.

Study period- August 8 to September 30/2024.

Process of study: As part of this study different questions are prepared to be completed by you. For unclear questions, if you need clarification you can ask any time. Since your participation in this survey is totally depends on your voluntary basis you have the full right to refuse, to participate and to stop at any time. To complete these questions at list it takes 15-20 minutes.

Advantage and disadvantage: There is no payment or any special privilege given for your participation in this study but your honest answer to these questions is very important to complete this study that will have impact on reduction of under - five children morbidity and mortality. Also you are not obliged to participate or give information you don't want. If you are not feeling good any time, please don't worry to ask to stop the procedure.

Confidentiality: Certainly I assure that your name or your child name will not be mentioned/ recorded anywhere. The confidentiality of the information you provided to me will be maintained and couldn't be accessed by third party but it's used for the purpose of research only and burnt by the end of the survey.

If you have any questions regarding this study, you can call me with phone number 0910648171**;** even you can call for institutional review board with phone number.....

Could I have your permission to continue? Yes ☐ No ☐

Signature of the data collector certifying that informed consent has been given verbally by respondent_____

Questionnaire code_____

Data collector name _____Signature _____Date of data collection_____

Checked by supervisor; Name _____Signature_____

QUESTIONNAIRE FORM: ENGLISH VERSION

Questions Proportion of Hypothermia and its Associated Factors among Neonatal Newborns

Date_____ Questionnaire code: ----------

Part I- Socio demographic characteristics

No	Questions	Coding category	skip
101	Age of the mother	----------	
102	Religion	A. Orthodox B. Muslim C. Protestant D. Catholic E. If other specify…….	
103	Residence	A. Urban B. Rural	
104	Educational status of the mother	A. Unable to read and write B. Primary school	

		C. Secondary school
		D. Diploma and above
105	Occupation of the mother	A. House wife
		B. Government employ
		C. Private business
		D. Student
		E. Farmer
106	Monthly income of the family	

107	Parity	A. Prim parous
		B. Multiparous

Part two: Hypothermia and Associated factor assessing question

108	Age of new born in hours	

109	Sex of new born	A. male
		B. Female
110	Did a mother have ANC visit?	A. Yes
		B. No
		If Yes how many times? ----------
111	Birth weight	

112	Gestational age (GA)	A. Preterm
		B. Term

113	Axillary temperature of the new born at admission	----------
114	Have you ever bathed your baby before 24 hours Old?	A. Yes B. No
115	Have you provided skin to skin contact immediately after birth?	A. Yes B. No
116	Have you applied oil massage of the skin immediately after birth?	A. Yes B. No
117	Did the new born started breast feeding within one hour after birth?	A. Yes B. No
118	Did the new born received CPR during birth?	A. Yes B. No
119	Did you have obstetric complication during pregnancy?	A. Yes B. No
120	How was the pregnancy type?	A. Single B. Twine C. Triple D. Quadruple
121	What was the mode of delivery?	A. Spontaneous Vaginal delivery B. Instrumental C. C/S
122	Did the new born exposed for cold during health care provider perform	A. Yes B. No

	physical examination & V/S	
123	Where did you deliver?	A. In born B. Out born
124	If your delivery is out born in which setting you deliver?	A. Other Hospitals B. Health Centre C. Private health facility D. Traditional birth center E. Homes
125	Warm intra-facility transportation	B. Used C. Not used
126	What was the time of delivery?	A. Day time B. Night time
127	How much was the room temperature of NICU	---

የ መረጃ መሰ ጫቅድ

የ ጥናቱ ርዕሰ: ሞጣ እና ደ/ ማርቆስ በሚ ኙት የ መንግስት ሆስፒታሎች ማሞቂያ ክፍል ላይ ያሉ የ ጨቅላ ህፃ ናት የ መቀት መቀነ ስ ማጠን እና ለ መቀት መቀነ ስ የ ሚያ ጋልጡ ተዛ ማጅ ምክን ያቶች ፣ ነ ሐሴ 2016 ዓ.ም.

ጥናቱን ያጸደቀው ተቋም: ባ/ዳር ዩኒ ቨርሲቲ ፣ ህክምና ና ጤ ና ሳይን ስ ኮሌጅ የ ማህበረሰብ ጤ ና ትምህርት ክፍል

መግቢያ መረጃ : የ ጨቅላ ህፃ ናት የ መቀት ማጠን መቀነ ስ አለ ም አቀፍ ችግር ሲሆን ለ ጨቅላ ህፃ ናት ህመም እና ሞት ዋነ ኛ ምክን ያት ነ ው በተለ ይም ታዳጊ እና ዝቅተኛ ገ ቢ ያላቸው አገ ራት የ ችግሩ ተጠቂ ና ቸው፡ ፡ የ ጨቅላ ህፃ ናት የ ሞት ማጠን ከ መቀት ማጠን መቀነ ስ ጋር ተዛ ማጅነ ት አለ ው፡ ፡ የ መቀት ማጠና ቸው የ ቀነ ሱ ህፃ ናት ከፍተኛ የ ሞት ማጠን አላ ቸው፡ ፡ ስለዚህ የ ጥናቱ ዋና ዓላማ ሞጣ እና ደ/ ማርቆስ ሆስፒታል ማሞቂያ ክፍል ላይ ያሉ አዲስ የ ተወለዱ ጨቅላ ህፃ ናት የ መቀት መቀነ ስ ማጠን ምክን ያት ምን እንደሆነ ለ ማወቅ እና ለ መቀት መቀነ ስ ሊያ ጋልጡ የ ሚቻሉ ተዛ ማጅ ምክን ያቶችን ከ ነ ሐሴ 2016 እስከ ማከረ ም 2017 ዓ.ም ለ ማጥና ት ነ ው፡ ፡

የ ፍቃደኝነ ት ማረ ጋገ ጫቅፅ

ባ/ዳር ዩኒ ቨርሲቲ ፣ ህክምና ና ጤ ና ሳይን ስ ኮሌጅ የ ማህበረሰብ ጤ ና ትምህርት ክፍል በ ሞጣ እና ደ/ ማርቆስ በሚ ኙት የ መንግስት ሆስፒታሎች ማሞቂያ ክፍል ላይ ያሉ የ ጨቅላ ህፃ ናት የ መቀት መቀነ ስ ማጠን እና ለ መቀት መቀነ ስ የ ሚያ ጋልጡ ተዛ ማጅ ምክን ያቶችን ከ ነ ሐሴ 2016 እስከ ማከረ ም 2017 ዓ.ም ለ ማጥና ት የ ተዘ ጋጀ አማር ኛ ማጠይቅ፡ ፡

መግቢያ

ጠፍ ይስጥልኝ ! ወድ ተሳታፊዎች ይህ ማጠይቅ የ ተዘጋጀዉበ ባ/ዳር ዩኒቨርሲቲ ፣ ህክምና ና ጠፍ ሳይንስ ኮሌጅ የ ማህበረሰብ ጠፍ ትምህርት ክፍል የ ማህበረሰብ ጠፍ ተመራቂ የ ሁለተኛ ድግሪ ተማሪ በ ሆኑት በ አቶ በለጠ አባቡ ሲሆን ጥናቱም ሞጣ እና ደ/ ማርቆስ በ ሚ ኙት የ መንግስት ሆስፒታሎች ማዝቂያ ክፍል ላይ ያሉ የ ጨቅላ ህፃ ና ት የ መቀት መቀነ ስ ማጠን እና ለ መቀት መቀነ ስ የ ሚየ ጋልጡተዛ ማጅ ምክንያቶችን ከ ነ ሐሴ 2016 እስክ ማከረም 2017 ዓ.ም ለ ማጥና ት ነ ው ፡ ፡ በ ዚህ ጥና ት ላይ በ መሳተፍዎም ሆነ ማጠይቁን በ መመላ ትዎ የ ተዘ ጋጀ ክፍያ የ ለ ም ነ ገ ር ግን ከ ዚህ ጥና ት የ ሚ ኘው ሚጃ ለ ጨቅላ ህፃ ና ት ጠፍ ደህንነ ት እና የ መቀት እንክብካቤ ለ ማሻሸ እንዲሁም ልዩ ትኩረ ት ለ ማሳጠት እና ለ ችግሩ የ መፍትሄ እርምጃ መወሰድ ለ ማሹ ህ ጋዊ አካላ ት ትልቅ አስተዋጽኦ አለዉ ፡ ፡ በ ጥናቱ ወቅት የ ጨቅላ ህፃ ንዎ የ ብብት የ መቀት ማጠን አንድ ጊዜ ይለካል ፡ ፡ ስለዚህ እርስዎ ይህንን ቃለ ማጠይቅ ስንጠይቅዎ ትክክለኛ ሚጃ መና ገ ርዎ እና የ እርስዎ ቅንነ ት ለ ዚህ አላማ መሳካት ትልቅ አስተዋጽኦ አለዉ ፡ በ ማጠይቁ ላይ ስምዎትን አይጠየ ቁም ፡ ፡ እንዲሁም መልሶ ቻችሁ በ ምስጠር ስለ ሚያዙ በ ምንም አይነ ት መንገ ድ ጉዳዩ ለ ሚይመላከታቸዉ አካላ ት አይገ ለጽም ፡ ፡ በ ዚህ ጥና ት በ መሳተፍዎ በ ልጅዎ ወይም በ እርስዎ ላይ የ ሚደርስ ጉዳት የ ለ ም እንዲሁም በ ዚህ ጥና ት በ መሳተፍዎ የ ሚከፈል ክፍያ የ ለ ወም ፡ የ እርስዎ በ ዚህ ጥና ት ላይ መሳተፍ በ ፍላጎ ትዎ ላይ የ ተመሰረተ ነ ው ፡ ፡ ማጠይቁን መሉ ለ መሉ ያለ መመላ ት ወይንም የ ሚቋረጥ መበትዎ የ ተጠበቀ ነ ው ፡ ፡

በ ጥናቱ ወስጥ ለ መሳተፍ ፈቃደኛ ነ ዎት? 1. አዎ ፊርማ_____ ቀን ----------

የ ማጠይቁ ሰብሳቢ ፊርማ_____ቀን ----------

2. አይደለ ሁም እባክዎን እዚህ ጋር ይቁሙ ፡ ፡

በ ጥናቱ ወስጥ ለ መሳተፍ ፈቃደኛ ከ ሆኑ ትክክለኛ የ ሆነ መልስ እንዲሰጡ በ ትህትና እንጠይቃለን ፡ :

ስለ ትብብርዎ በ ቅድሚያ እና መሳግናለን !!

QUESTIONNAIRE FORM: AMHARIC VERSION

አጠቃላይ መመሪያ

1. ለምርጫጥያቄዎች ከቀረቡት አማራጮች አንዱን ይምረጡ

2. ከ ቀረቡት አማራጮች መልስ ካላገኙ የራስዎን መልስ ለመጀመ ሰብሳቢዉአካል ይንገሩት

3. በማንይቁ አሞላል ላይ ጥያቄ ካለዎት መጀመ ሰብሳቢወን አካል ማጠየ ቅ ይችላሉ

4. በ ጥናቱ ወቅት ችግር ካለ በ ስልክ ቁጥር 0910648171 /0960034902 ደወለውማጠየ ቅ ይችላሉ

ክፍል አንድ

1. አጠቃላይ ሁኔታን የ ሚመለከቱ ጥያቄዎች

ተ ቁ		
101	የ እናት እድሜ	----------
102	ሀይማኖት	1. አርቶዶክስ
		2. ፕሮቴስታንት
		3. ሙስሊም
		4. ሌላ ካለ ይጠቀስ---------
103	የ ማጠብት አካባቢ	1. ከተማ
		2. ገጠር
104	የ እናትዬዋ የ ትምህርት ደረጃ	1. ማንበብ ና መጻፍ አትችልም
		2. የ መጀመሪያ ደረጃ ትምህርት
		3. የ ሁለተኛ ደረጃ ትምህርት
		4. ዲፕሎማና ከዛበላይ
105	የ እናትዬዋ ስራ	1. የ ቤት እመቤት

		2. የ መ ን ግ ስ ት ሰ ራ ተ ኛ
		3. የ ግ ል ስ ራ
		4. ተ ማ ሪ
		5. አ ር ሶ አ ደ ር
106	የ ቤ ተ ሰ ብ ዎ ወ ር ሃ ዊ ገ ቢ ም ን ያ ህ ል ነ ው?	_____
107	ስ ን ት ል ጆ ች ወ ል ደ ሻ ል?	1. አ ን ድ ብ ቻ
		2. ሁ ለ ት ና ከ ዛ በ ላ ይ

ክ ፍ ል ሁ ለ ት

2. የ መ ቅ ት ማ ጠ ን መ ቀ ነ ስ እ ና ለ መ ቅ ት መ ቀ ነ ስ የ ሚ ያ ጋ ልጡ ተ ዛ ማ ጅ ም ክ ን ያ ቶ ች ን ማ ጠ ቂ ያ

108	የ ጨ ቅ ላ ህ ፃ ኑ/ኗ እ ድ ሜ በ ሰ ዓ ት	----------
109	የ ጨ ቅ ላ ህ ፃ ኑ/ኗ ፆ ታ	1. ወ ን ድ
		2. ሴ ት
110	እ ና ት ከ መ መ ለ ዱ ዋ በ ፊ ት የ ነ ብ ሰ ጠ ፎ ከ ት ት ል ነ በ ራ ት ወ ይ ?	1. አ ዎ
		2. የ ለ ም
		አ ወ ካ ሉ ስ ነ ት ጊ ዜ ? -------
111	ሲ ወ ለ ድ የ ነ በ ረ ው የ ክ ብ ደ ት ማ ጠ ን	----------
112	የ እ ር ግ ዝ ና ዕ ድ ሜ በ ሳ ምን ት	----------
113	ወ ደ ማ ሟ ቂ ያ ክ ፍ ል ሲ ገ ባ ያ ለ ው የ ጨ ቅ ላ ህ ፃ ኑ/ኗ የ ብ ብ ት የ መ ቅ ት ማ ጠ ን ?	----------
114	ጨ ቅ ላ ህ ፃ ኑ ን/ኗ ን ከ 24 ሰ ዓ ት በ ፊ ት ገ ላ ዋ ን/ወ ን	1. አ ዎ

	አጥበዋታል/አጥበውታል?	2. አይደለም
115	ጨቅላ ህፃኑ/ኗ እንደተወለደ/ች ወዲያውኑ ከሰውነ ትሽ ቆዳ ጋር	1. አዎ
	በማ ካካት አቅፈሽዋል/ታል?	2. አይደለም
116	ጨቅላ ህፃኑ/ኗ እንደተወለደ/ች ወዲያውኑ ዘይት ቀብተሽ	1. አዎ
	አሽተሽዋል/ታል?	2. አይደለም
117	ጨቅላ ህፃኑ/ኗ በተወለደ/ች በአንድ ሰዓት ወስጥ ጡት መጥባት ጀምሯል/ራለች?	1. አዎ
		2. አይደለም
118	ጨቅላ ህፃኑ/ኗ እንደተወለደ/ች የ አተነፋፈስ እና ልብ ምት እገዛ (CPR) ተደርጎላት/ለት ነበር?	1. አዎ
		2. አይደለም
119	በ እርግዝና ወቅት የገጠማሽ የተወሳሰበ ችግር ነበር?	1. አዎ
		2. አይደለም
120	የእርግዝናውአይነት እንዴት ነበር?	1. አንድ ብቻ
		2. መንታ
		3. ሦስት
		4. አራት
121	የወለድሽበት አይነት ምንድን ንው?	1. በሜህፀን
		2. በመሳሪያ በመታገዝ
		3. በቀዶ ጥገና
122	ህፃንሽ በባለሙያ ክትትል ሲደረግለት ለቅዝቃዚ ተጋልጦ ነበር?	1. አዎ
		2. የለም

123	የት ነው የወለድሽው?	1. በዚህ ሆስፒታል
		2. ከዚህ ሆስፒታል ውጭ
124	የ ወለድሽውከዚህ ሆስፒታል ውጭከሆነ የት ቦታ ወለድሽ ?	1. ሌላ ሆስፒታል
		2. ጤና ጣቢያ
		3. የ ግል ጤና ተቋም
		4. የ ባህል ሞዋለጃ ቦታ
		5. ቤት ውስጥ
125	በጉዞላይ እያለሽ ህፃንሽን መቅት እነዳገኝ የ ተጠቀምሽውነገር አለወይ?	አዎ
		2. የለም
126	የ ወለድሽበት ጊዜ ምን ነበር?	1. ቀን
		2. ሌሊት
127	የ ሞሞቂያ ክፍሉ የ መቅት ማጠን ስንት ነው?	----------

13. DECLARATION

The under signed, declared that this thesis is my original work, has never been present in this or any other university, and that all the resources and materials used for the research have been fully acknowledged.

Principal investigator

Name: Belete Ababu

Signature: ----------

Date: ----------

Advisors:

Mrs. Wubalem Gebreamlak Signature: ---------- Date: ----------

Mrs. Muluye Molla Signature: ----------Date: ----------

Examiner's Approval Sheet

The undersigned, members of the board of examiners of the final thesis defense by **Belete Ababu**, have read and evaluated his or her thesis "Neonatal hypothermia and associated factors among newborn admitted in neonatal intensive care unit of selected hospitals in east gojjam zone. Therefore, I recommend that the student has fulfilled the requirements and hence can submit the thesis to the department.

Name of Examiner: _____Signature:_____Date:_____

Certification of the final thesis

I hereby certify that all the corrections and recommendations suggested by the board of examiners are incorporated into the final thesis entitled "Neonatal hypothermia and associated factors among newborn admitted in neonatal intensive care unit of selected hospitals in east gojjam zone, 2024". By **Belete Ababu.**

Department Head: _____ Signature: _____ Date: _____

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Principal investigator

Name: Belete Ababu

Signature: ----------

Date: 22/11/17

Advisors:

Mrs. Wubalem Gebreamlak Signature: ---------- Date: 23/11/2017

Mrs. Muluye Molla Signature: ---------- Date: 23/11/2017

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