ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE

KNOWLEDGE, PRACTICE AND ASSOCIATED FACTORS TOWARDS NEONATAL RESUSCITATION AMONG MIDWIVES WORKING IN DELIVERY ROOM OF PUBLIC HEALTH CENTERS IN ADDIS ABABA

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A THESIS TO BE SUBMITTED TO DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE, COLLEGE OF HEALTH SCIENCES ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN EMERGENCY AND CRITICAL CARE NURSING.

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Advisor's Approval Sheet

This is to certify that the thesis entitled "Knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers in Addis Ababa Ethiopia'' is submitted in partial fulfillment of the MSc in "Emergency medicine and critical care nursing" to the Graduate Program of the College of Health Sciences of Addis Ababa University and has done by Tsegaye Yitayih ID No: GSR/9250/14 under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the Department.

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This thesis by Tsegaye Yitayih is accepted in its present form by the board of examiners as Satisfying thesis requirement for the degree of masters in emergency medicine and critical care nursing.

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Declaration

I hereby declare that this MSc thesis is my original work and has not been presented for a degree in any other university and all sources of material used for this thesis have been duly acknowledged.

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DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE

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Abbreviations and Acronyms

BMV: Bag Mask Ventilation

CPR: Cardiopulmonary Resuscitation

EDHS: Ethiopian Demographic Health Survey

HCPs: Health Care Providers

HC: Health Center

LMIC: Low- and middle-income countries

NEONC: National Emergency Obstetric and Newborn Care Survey

PPV: Positive Pressure Ventilation

SC: Sub City

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ABSTRACT

Background: Neonatal resuscitation is simple and life-saving intervention for birth asphyxia, a leading cause of neonatal mortality. Worldwide, four million neonate deaths happen annually, and birth asphyxia accounts for one million deaths. Increasing providers' knowledge of neonatal resuscitation and improving its practice is critical for delivering quality care and for morbidity and mortality reduction.

Objective: To assess knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers at Addis Ababa city, Ethiopia 2023.

Methods: Institutional based cross-sectional study design was employed among 141 study population selected by simple random sampling method. Self-administered questionnaire and interview guide were used to collect data. Data was entered to Epidata 4.6 and exported to Statistical Package for Social Sciences (SPSS) version 26 for analysis. The association between the dependent variable and independent variables were analyzed using binary logistic regression. Adjusted odds ratio with 95% CI was computed and variables with p-value ≤ 0.05 were considered as statistically significant.

Result: A total of 134 participants were included in the study with a response rate of 95%. Only 42.5% and 26.9 % of the participants had the appropriate level of knowledge and practice towards neonatal resuscitation respectively. Lack of training (AOD=2.47, 95% CI: 1.086-5.640, P-value=0.031), unavailability of guidelines (AOD=4.34, 95% CI: 1.78-10.59, P-value=0.001) and absence of supportive supervision (AOD=3.27, 95% CI: 1.38-7.74, P-value= 0.007) were significantly associated with poor knowledge. While educational level (AOD=3.34, 95% CI: 1-11, P-value= 0.048), lack of training (AOD=3.32, 95% CI: 1.17-9.4, P-value= 0.024) and unavailability of guidelines (AOD=4.57, 95% CI: 1.47-14.12, P-value= 0.009) were significantly associated with poor practice.

Conclusion and Recommendation: Overall knowledge and practice of midwives were inadequate. Strengthening training and supportive supervision needs to improve knowledge and practice of midwives

Key words: Neonatal resuscitation, knowledge, Practice, Public health centers, Addis Ababa, Ethiopia

1. Introduction

Background

Neonatal period is the period from birth to28th day of life. Due to highest death rates and morbidity during this phase it is the most precious and high-risk stage of life. The average daily mortality rate during the newborn phase is over 30 times greater than during the postnatal phase(1). Neonatal death rates have not declined to the same level worldwide in the past 10 years especially in low middle countries(2).

Neonatal resuscitation is a simple, inexpensive and an approach for asphyxia, which is leading cause of mortality in neonates less than 28 days of life(3). To start and sustain the neonate's cardiopulmonary functioning, it takes the use of specific knowledge and skill, as well as routine practice to maintain the provider's proficiency(3,4).According to WHO reports of 2019, neonatal death were globally around 2.4 million annually, from these 1 million newborns die within the first day of life, and most of deaths ($3/4^{th}$)occur during the first week of life(5).

Almost all child birth needs some assistant at birth to breathe, others need basic resuscitation with BMV and small number of live births needs advanced neonatal intensive care. Less than 1% of babies require significant resuscitative procedures, and 10% of newborns need some support breathing at birth. (6).

Asphyxia, inability of a newborn to breathe at birth, was commonest cause of neonatal deaths. Globally resuscitation during birth can avert a significant fraction of mortality among the four million newborns who experience birth asphyxia each year and the one million fatalities that result from it. Adequate resuscitation techniques could avert the majority of asphyxia-related deaths, which would reduce newborn mortality overall. Ineffective resuscitation techniques are persistently associated with high infant fatalities from birth asphyxia in the first one day in low-income nations. (7).

As a result, it is obvious that reducing neonatal mortality must start from the first minute of birth, and successful neonatal resuscitation by skilled medical professionals may be

able to reduce perinatal mortality. According to Organization for Economic and Development 2020 report, In lower-middle and low-income nations in the Asia-Pacific region, the average newborn mortality rate in 2018 was 17.7 fatalities per 1000 live births, roughly half the rate seen in 2000 but still higher from the target set by the SDG.

The risk of death for a newborn in sub-Saharan Africa is 10 times higher in the first month of life than for a newborn in a high-income country(5). One in every thirty children in Ethiopia dies in the first month of life, according to EMDHS 2019 report(8). Prevalence of birth asphyxia was 22.8% and it is also the commonest cause early neonatal mortality in Ethiopia(9).

Improving health professional's skills on NR is critical for delivering quality care and crucial intervention for birth asphyxia that intern reduces neonatal morbidity and mortality. Studies done in different public health care facilities in Ethiopia shows, Knowledge and practice of NR skills in health professionals were not adequate; these might increase the death rate of neonates due to asphyxia(10).

The competency of neonatal resuscitation and the resulting neonatal outcome are affected by a variety of factors, including the educational level, experience, and specialization of health professionals; their knowledge; and characteristics of the institution, such as NR training, the availability NR of guideline, and equipment(11,12) .

Midwives are on the front lines of newborn care, and they are responsible for providing life-saving care to newborns who are not breathing or who are breathing inadequately. Therefore, it is essential that midwives have the knowledge and skills to perform neonatal resuscitation effectively. The objective of this study is to examine the knowledge, practice, and associated factors of NR among midwives working in delivery rooms of health centers in Addis Ababa, Ethiopia.

Statement of the Problem

Globally around 6700 newborns die every day and from this sub-Saharan Africa records the highest neonatal mortality (42%) succeeding by central and southern Asia (37%)(5). Only five nations in sub-Saharan Africa accounts for 50% of neonatal deaths: Nigeria, DR Congo, Ethiopia, Tanzania and Uganda(13). A study conducted in southern Nigeria shows baseline knowledge and practice of NR among health professionals in health centers were insufficient(14). EMDHS results show that the neonatal death rate 33 deaths per1000 live births and since 2016 somewhat increases from 29 to 33 deaths =(8).

Not only can asphyxia result in death, but it can also have both short and long term neurodevelopmental consequences, such as practically incurable cognitive and motor deficits. Asphyxia survivors may also experience neurological sequel such hypoxic-ischemic encephalopathy, post-traumatic stress disorder, and neurologic impairment (15,16).

Despite of health professional's skills on NR is a key part of providing high quality care to newborns and crucial for management of birth asphyxia that intern reduces neonatal morbidity and mortality but knowledge and skill of health care providers on NR were still inadequate. These needs further investigation on factors that affect health professional towards effective neonatal resuscitation.

The majority of newborn deaths that occur too soon are caused by birth asphyxia (BA) and a failure to start spontaneous respirations(17–19). Asphyxia is thought to be the cause of roughly 25% of newborn fatalities worldwide, according to a WHO report from 2012. The study done in Ethiopia in 2016 revealed overall knowledge of health professionals was insufficient (49%) (20).

The Ethiopian Government has put in place policies and strategies aimed at reduction of child hood mortality especially in neonatal mortality. But despite these attempts, research results have shown that early neonatal death is still commonest cause of child mortality. This demonstrates that there is a challenge and a gap in reduction of early neonatal death. Data's were indicated that asphyxia has a significant negative impact on newborn

survival. To prevent asphyxia related morbidity and fatality, health professionals providing care for the infant needs to be skilled in resuscitation technique.

Studies have been done in different hospitals but there is a limited research on neonatal resuscitation in primary level health facilities, where majority of birth takes place. Thus, the aim of this study is to assess health professional's knowledge, practice and associated factors towards NR in the study area because little is known about neonatal resuscitation and the factors having a relation with these.

Significance of the study

Midwives are expected to be proficient in NR in order to mitigate the incidence of infant mortality and morbidity due to asphyxia. The knowledge and skills of midwives in NR should be regularly evaluated as knowledge and practice in this field are constantly evolving. To keep skill and knowledge in line with current understanding and practice, it is crucial to perform regular and ongoing assessments.

The findings of this investigation will:-

Pinpoint any gaps in health workers' knowledge and practice of neonatal resuscitation, which will help to significantly reduce infant morbidity and death. And it is useful to plan preventive actions and provide skilled newborn resuscitation to save the neonate's life.

It is an excellent resource for a variety of stakeholders at different levels, including managers and researchers in the public and private sectors of government and academia. Finally, the results of this study provide important knowledge about healthcare professionals' knowledge and practice regarding neonatal resuscitation, which is important information for researchers interested in this field.

2. LITRATURE REVIEW

Over view of neonatal resuscitation

NR is a systematic approach to providing care to newborns who are not breathing or breathing poorly. Most newborns who are not breathing at birth can be preserved by concentrating on the prompt administration of the vital therapies of drying, warming, clearing the airway, stimulation to breathe, and BMV and less than 1% of deliveries require sophisticated interventions for newborns, such as endotracheal intubation, chest compressions, and medicine(21–24).

The immediate steps in NR are to assess the newborn's condition, stimulate breathing, suction the airway, provide BMV, perform chest compressions, and administer medications and volume expanders as needed. (24,25). When resources are scarce, successful resuscitation can be performed with only the most basic tools and knowledge; promoting the efficient use of a bag-valve-mask alone should make it possible to improve neonatal outcomes without the use of more complex and expensive technologies(26).

Numerous studies indicate that basic neonatal resuscitation performed in a facility by a skilled health care provider can prevent 30% of intrapartum-related neonatal deaths. However, coverage of this intervention is still low in the nations where the majority of neonatal deaths occur, missing an opportunity to save lives. (3,27).

Knowledge towards Neonatal resuscitation

The ability of healthcare providers to perform neonatal resuscitation is crucial for saving the lives of newborns(28). Multiple studies show there is a knowledge gap among nurses and midwives about every aspect of newborn care and resuscitation. Across-sectional observational study of 93 nurses from 4 government hospitals and 3 notable private hospitals in India's Kanyakumari area found that just 34% were proficient in basic newborn resuscitation.(29).

Similarly, a cross-sectional survey done in Pakistan revealed that just 49% of the midwives had sufficient knowledge. According to this study, only 42.85% of midwives

were familiar with the proper sequence for the first steps in neonatal resuscitation and Bag Mask Valve (BMV); the right percentage of positive pressure ventilation (PPV) was given by 26.53% of midwives. But midwives had a greater knowledge of the preparation and proper suctioning sequences, with 67.34% and 69.38% of them having a good understanding of these areas, respectively. (30).

A cross-sectional observational study conducted in nursing staff members in Sri Lanka demonstrated that majority of individuals (79.3%) did not know how to perform Positive pressure ventilation or chest compression correctly. The remains performed these interventions poorly, and only one or two individuals performed them correctly. (31).

A study done in Ghana, Tamale revealed that a vast majority of respondents (98.1%) had inadequate knowledge of NR(11). Study in Nigeria also supports these knowledge of neonatal resuscitation is inadequate which was only 7% (95% CI:3.2–13.7) of health providers demonstrated good knowledge(32). A descriptive survey conducted at the Federal Medical Centre in Asaba, Delta State, Nigeria found that nurses' knowledge of nursing management of birth asphyxia does not significantly vary with their years of experience(33). Study done in Kenya among HCPs, around 70% study participant were inadequate knowledge on NR(34).

Analysis of the 2016 (NEONC) on the knowledge of newborn resuscitation among Ethiopian healthcare professionals shows only 49% are average knowledge(20). Cross sectional study done Eastern Ethiopia shows 9.8% of the study respondents had good knowledge about NR(35). An Ethiopian cross-sectional survey revealed that midwives and nurses had mean knowledge scores were 42.8% and 43.9%, respectively.(36).

Cross sectional study done in South Wollo, Ethiopia found that the overall mean knowledge score of midwifes regarding NR was 68.68%.(37).

Another study done in Gonder, Ethiopia showed that 53.5% of nurses and midwives had poor knowledge(38). But in 2022, another institutional based cross sectional study done Addis Ababa selected public hospitals shows different results from these, in which majority of 87.3% of the respondents had adequate knowledge(39).

Practice towards Neonatal Resuscitation

A study conducted in Pakistan on practice of nurses on birth asphyxia revealed that having work experience less than five years (44%) and age less than 24 years (11%)had poor(40). An observational study done in India revealed that only 15% of the 93 nurses performed better than 85% on the step of chest compression(29).

A study conducted in Kano, Nigeria with a semi structured questionnaire only 5% of the participants had good practice on NR(32). Another study also in Nigeria shows that only 10% of nurses adopted adequate level of performance(33). According to a study done in Kenya, airway clearance is the most practiced step (85%), followed by dry the baby and stimulate the baby (60%) and BMV least frequently performed step(42).

Cross sectional study done in northwest Ethiopia revealed that mean scores of nurse's and midwife's skills in NR were 55.8% and 59.2% respectively(36). A study done in south wello northern Ethiopia respondents mean practice scores were 62.96%(37). Another cross-sectional study done in eastern Ethiopia only 11.2% of the participants had good skill retention(10). But another study in Addis Ababa selected public hospitals, Ethiopia shows different from these, which is 89.2% of the respondents had adequate practice(39).

Factors affecting knowledge and practice towards neonatal resuscitation

Different studies associate Profession with knowledge and practice on NR.

A study conducted in Baghdad, Iraq found that there is no significant correlation between nurses' performance and their demographic characteristics, such as age, level of education, marital status, number of years of employment in nursing, years of experience in the delivery room, and number of training courses(43). Another study done in Afghanistan revealed that having training was associated with greater knowledge and skill(44).A study done in Kano, Nigeria on Being a doctor compared to nurses and midwives indicated good knowledge(32).

Cross sectional study done in Ethiopia revealed that there is no significant variation in knowledge and practice scores of the respondents in terms of age, sex, profession and work experience(36).

Another cross sectional study conducted in public health institutions in eastern Ethiopia found that nurses and midwives who had received training, were unmarried, and held a degree or higher were significantly associated with a high level of knowledge(35).

An institutionally based cross sectional study done in eastern Ethiopia using a pre-test organized and observational checklist from midwives and nurses. When compared to nurses, midwives had a 7-fold higher likelihood of keeping their knowledge in NR. There was a four-fold increase in skill retention among those with a BSc or higher. Additionally, respondents who had ever practiced were three times more likely to retain the skill and those with good NR knowledge were three times more likely to do so those with low knowledge(10).

Another study done in Gonder northwest Ethiopia revealed that sex, training and the profession of the participant had a significant association with the knowledge level of NR. Respondents who received training increased knowledge by almost eight times compared to non-trained participants. Participants who were female exhibited about two times less knowledge than those who were male(38).

Good quality, affordable, accessible and appropriate neonatal resuscitation equipment is required for a successful neonatal resuscitation(45)

Conceptual Framework

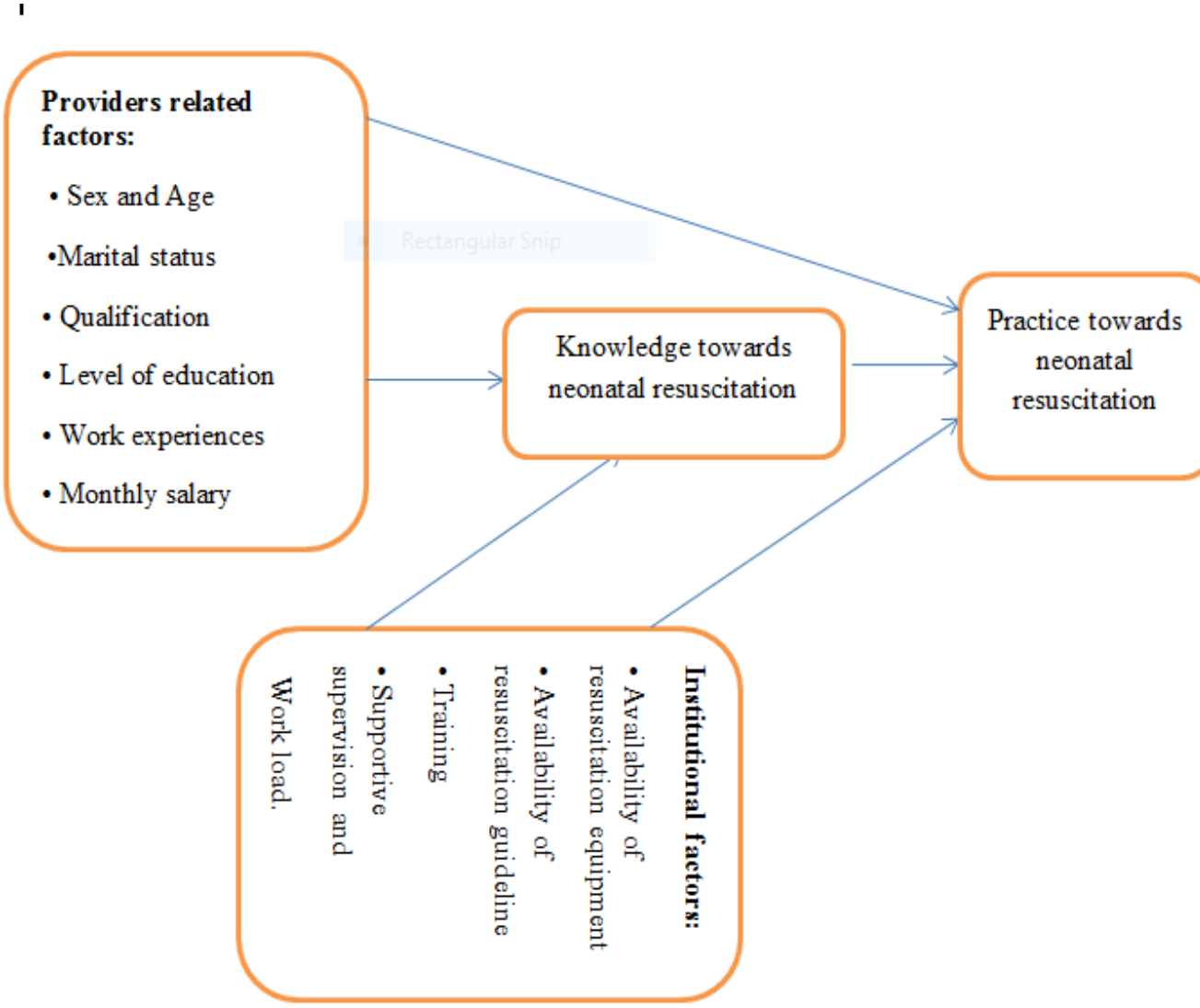

Figure 1.Conceptual framework adapted from similar literatures, similar studies and modified knowledge practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers Addis Ababa, Ethiopia, 2023.

3. OBJACTIVES

General objective

To assess the knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers in Addis Ababa Ethiopia 2023.

Specific objective

1. To assess knowledge level of midwives towards neonatal resuscitation working in delivery room of public health centers in Addis Ababa Ethiopia 2023.

2. To assess practice level of midwives towards neonatal resuscitation working in delivery room of public health centers in Addis Ababa Ethiopia 2023.

3. To identify factors affecting knowledge and practice level of midwives working in delivery room towards neonatal resuscitation in public health centers of Addis Ababa Ethiopia 2023.

4. METHODES AND MATERIALS

Study area and Period

The study was conducted in selected public health centers in Addis Ababa from March 25 to April 15, 2023. Addis Ababa, the capital city of Ethiopia, is one of the largest cities in the country and is divided into 11 sub-cities and 116 woredas. According to the United Nation World Urbanization Prospects estimation the population of Addis Ababa is approximate to around 5,005,524 by 2021 with 4.1% annual growth rate. Fourteen public hospitals and 101 health centers are found in Addis Ababa. The estimated catchment area of a health center in Addis Ababa is 40,000 people.

Study design

A cross-sectional study was conducted to assess the knowledge, practice, and associated factors of NR among midwives working in delivery rooms of public health centers in Addis Ababa, Ethiopia, 2023.

Population

Source of population

All midwives working in delivery room of Addis Ababa public health centers.

Study population

All midwives working in delivery rooms of selected public health center.

Study unit

All selected midwives working in delivery rooms of selected public health center.

Eligibility Criteria

Inclusion Criteria

Midwifes working in delivery rooms of public health center during data collection time.

Exclusion criteria

Midwives unavailable during data collection, on sick leave, maternal or annual leave, had less than six months work experiences and who are not permanent staffs were excluded from the study.

Sample Size determination

The sample size for this study was calculated Epi info version 7 software using the single population proportion formula by taking from previous study which was done to asses magnitude and associated factors of NR among health care providers in selected public hospitals of Addis Ababa, 87.3% and 89.2% proportion of health professionals had good knowledge and practice respectively(39). Based on p value of 0.87 and a confidence level of 95%, a margin of error of 0.05, and a none response rate of 10 % the final sample size was calculated as:

$$n=\frac{(Z\alpha/2)^2 p(1-p)}{d^2}$$

- n=required sample size
- p = health professional knowledge on neonatal resuscitation (87.3%)
- Z = 95% confidence interval and α =0.05
- Zα /2 = Standard normal distribution (Z = 1.96)
- d = level of accuracy; which set at 5%. Hence;

$$n = \frac{(1.96)^2 * 0.87\ (1-0.87)}{(0.05)^2} = 146$$

Because the source population was small, a correction formula was used to adjust the sample size calculation as bellow

$$nf = \frac{no}{1 + \frac{no}{N}}$$

Where:

no = The sample size before using the correction formula

nf = The sample size after using correction formula

N = Total source population is 1010. Using this formula the total sample size was 128 and by adding 10% non-response rate the final sample size was **141** midwifes.

Sampling Procedure and Technique

Addis Ababa city administration is divided into 11 sub-cities. From these sub-cities 4 sub-cities; Addis Ketema, Lideta, Nifas Silk Lafto and Yeka SCs were selected by using lottery method. There were 14 HCs in Addis Ketema, 8 HCs in Lideta, 8 HCs in Nifas Silk Lafto, and 10 HCs in Yeka SC. Next proportional number of health centers; 5Hcs, 3HCs, 3HCs and 4HCs respectively were selected by simple random sampling method from the selected sub cities. After calculating total number of sample size, proportional number of midwives was allocated depending on number of midwives in each selected health center. The final sample of midwives was selected using simple random sampling.

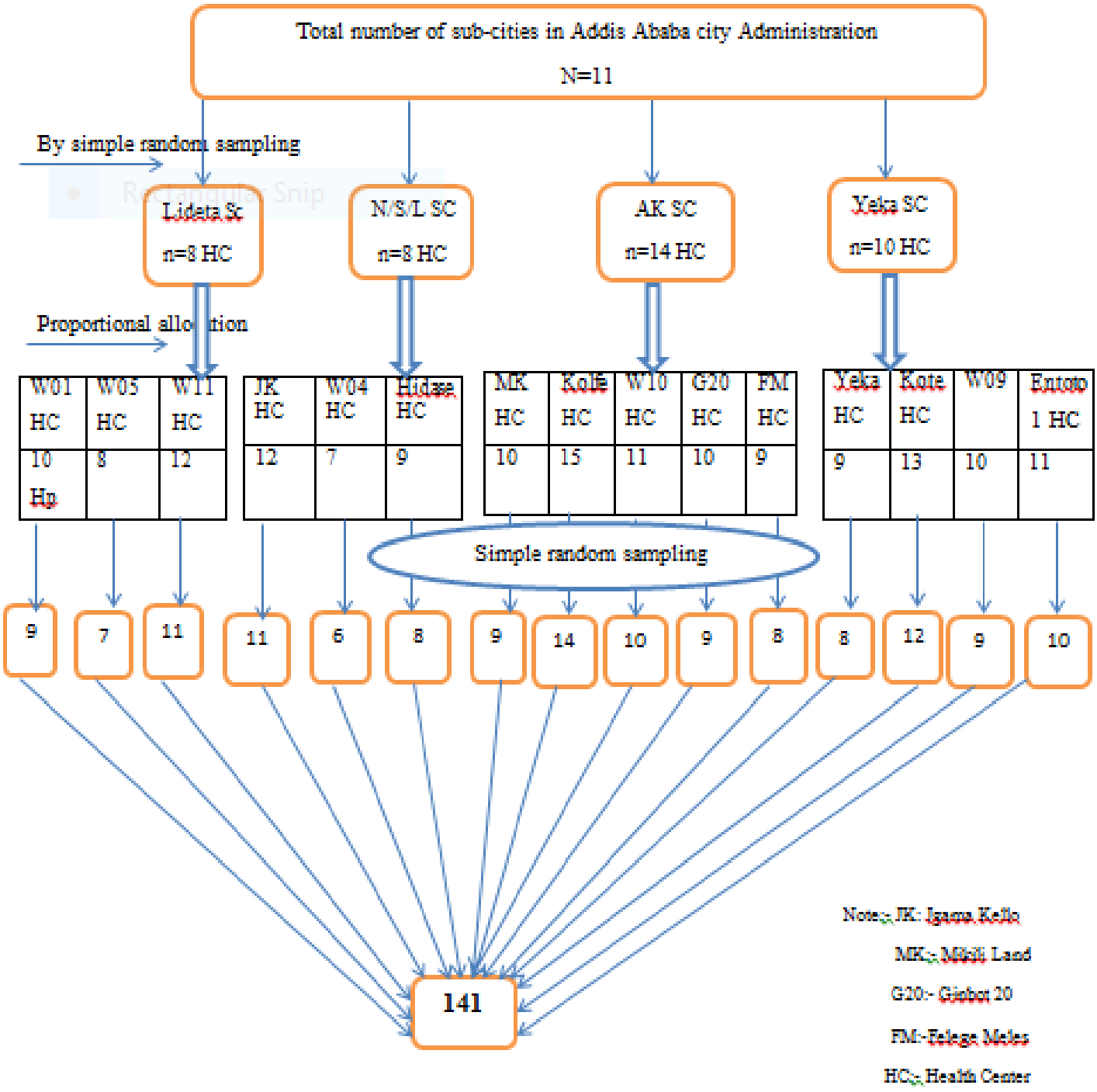

Figure 2 sampling procedure for knowledge practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers Addis Ababa, 2023.

Study variables

Dependent Variables

- Knowledge towards Neonatal Resuscitation.
- Practice towards Neonatal Resuscitation.

Independent variables

Provider related factors:-

- Age
- Sex
- Marital status
- Monthly salary
- Level of education
- Work experiences

Institutional factors:

- The availability of NR equipment
- The availability of NR guidelines
- Supportive Supervision
- Workload
- Provision on job training

Data collection tool and Procedure

Data collection tool was prepared from different similar literatures. A structured self-administered questionnaire was used to assess provider characteristics, institutional characteristics and knowledge; and structured interview was used to asses practice level of health professionals regarding neonatal resuscitation. The data-gathering process involved four data collectors (BSc midwives) and one supervisor (MPH). Prior to the data collecting date, a one-day training was provided on the purpose of the study, data gathering methods, instruments, respondents' approach, data confidentiality, and respondent's rights.

Data quality management

Before commencement of data collection, the questionnaires were pretested on 5% randomly selected participants from Addisu Gebeya health center which are not included in the study. The questioners were amended as needed after pretesting. Before any attempt was made to enter code and analyze the acquired data, it was examined for consistency and completeness. Finally, to manage and control data entry errors, Epidata version 4.6 was employed.

Data Processing and Analysis

Data was checked, coded, and put into Epidata version 4.6 before being exported and analyzed in SPSS version 26. The analysis was not conducted with incomplete or inconsistent data. The proper text, figures, and tables were used to generate and provide descriptive analysis, such as percentage, proportions, frequencies, and mean. Binary logistic regression was used to assess the potential association between factors and the knowledge and practice levels of health professionals. Bivariate analysis was first used to identify factors associated with the outcome variable. Variables with a p-value < 0.25 in bivariate analysis were considered for multivariate logistic regression. The magnitudes of the association between different independent variables and the dependent variable were

measured using p-values. A p-value of less than 0.05 was considered to be statistically significant.

Operational Definitions

Neonatal resuscitation: - Interventions after birth to 28days of the baby to assist in breathing and circulation.

Work load: - According to the Ethiopian Pediatric Society, nurses and midwives who care for more than 5 neonates per day or work for more than 8 hours per day are considered to be working with a heavy workload.

Knowledge:- Midwives who scored at least 75% (≥24 correct responses from 32 knowledge questions) on a structured knowledge questionnaire were considered to have good knowledge of NR, while those who scored below 75% (<24 correct responses from 32 knowledge questions) were considered to have poor knowledge(46).

Practice:- Midwives who scored at least 80% (≥24 correct responses from 30 practice questions) on an interview-based practice questionnaire were considered to have good practice of NR, while those who scored below 80% (<24 correct responses from 30 practice questions) were considered to have poor practice(37).

Ethical Consideration

Ethical approval was obtained from the Department of Emergency Medicine and Critical Care at Addis Ababa University's College of Health Sciences. Permissions were granted by the Addis Ababa Health Bureau, sub-city health offices, and health centers in the study area. Prior to data collection, all study participants provided written consent. Participation in the study was voluntary, and the autonomy of participants was respected.

The confidentiality of the study participants' data was protected by de-identifying the data, such as removing names and other identifying information. The only identifier used was a unique identification number. The written questionnaires were kept confidential throughout the research process, and no other identifying information was included.

Dissemination of the Result

Finding of the study will be submitted and presented to AAU, college of health sciences, department of Emergency Medicine and critical care. A copy of the document will be made available to the AAU Health Science College Library for future learning. It will also be disseminated to the Addis Ababa Regional Health Bureau and sub-cities health offices to provide basic information about Midwives knowledge and practice of NR. Hard copies of the study findings will be made available to participating health centers for use in training and development activities. The paper will be submitted to peer-reviewed scientific journals for possible publication. The findings will also be presented at relevant conferences.

5. RESULT

5.1 Socio demographic characteristics

Of the 141 participants who were randomly selected from 15 public health centers, 134 participated in the study, resulting in a response rate of 95%. Out of 134 study respondents 70 (52.20%) of the respondents were females. Regarding educational status, 86 (64.2%) were first degree holders and the remaining 48 (35.8%) were diploma. The ages of the respondents ranged from 20 to 39 years, with a mean age of 28.54 years and a standard deviation of 3.973 years.

5.2 Knowledge level of the participant towards neonatal resuscitation

This study revealed that inadequate knowledge (score less than 75%) toward NR among midwives were 57.5%. The mean score of the respondents were 22.26 (SD±5.95) with maximum and minimum knowledge scores of 30 and 8 out of 32 knowledge questions respectively (Figure3).

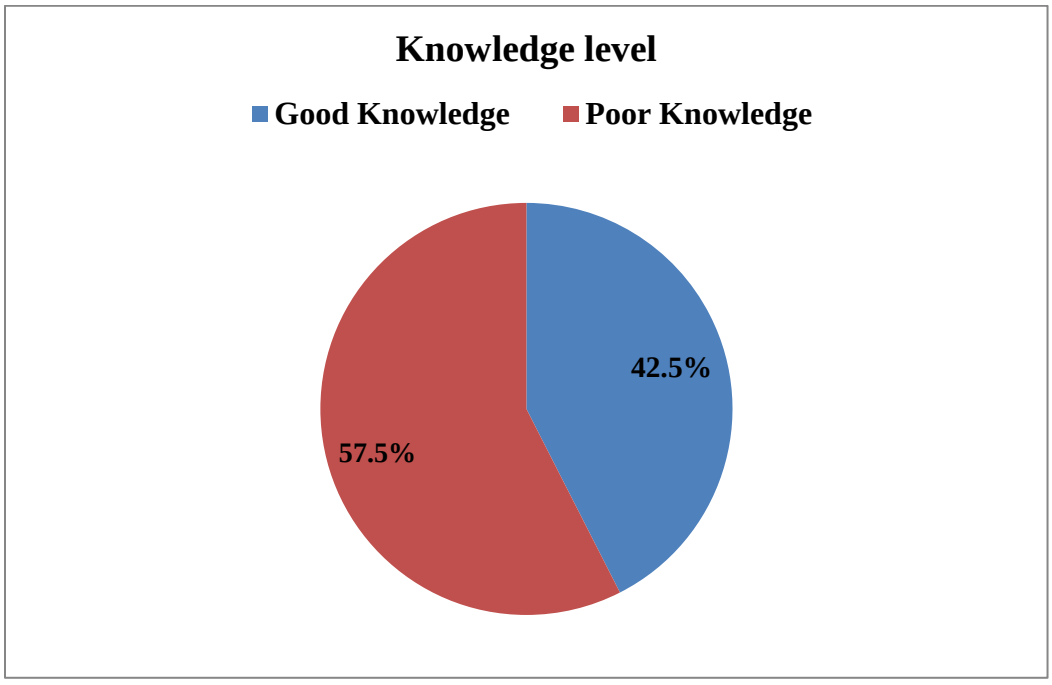

Figure3. Knowledge level of midwives towards NR in selected public health centers of Addis Ababa, Ethiopia, April 2023.

Knowledge level the participants in different steps

Majority (80.6%) of participants in this study know that all newborns need an initial evaluation and (90.3%) participants know the indications when to start chest compression during NR. Additionally, 79.1% of the participants knew that recommended ratio of chest compression to ventilation 3:1.

Table1.Response of participants in common knowledge questions towards neonatal resuscitation in selected public health centers of Addis Ababa, Ethiopia, 2023

Question	**Yes** **N (%)**	**No** **N (%)**
All new born require initial assessment	108 (80.6)	26 (19.4)
HR <60b/m after BMV is an indication to start chest compressions during NR	121 (90.3)	13 (9.3)
Epinephrine is preferred medication during resuscitation	121 (0.3)	13 (9.3)
Recommended ratio f chest compression to ventilation 3:1	106 (79.1)	28 (20.9)
The depth of chest compressions should be one-third the anteroposterior diameter of the chest	87 (64.9)	47 (35.1)
A heart rate of less than 60bpm after 30 seconds of ventilation and 60 seconds of coordinated chest compression and ventilation is an indication to start medication during NR.	100 (74.6)	34 (25.4)
Mask should cover the mouth, nose, and tip of the chin during NR, but not the eyes	108 (80.6)	26 (19.4)
Two thump techniques for chest compression	69 (51.5)	65 (48.5)
The baby's neck should be in a slightly extended position for NR	104 (77.6)	30 (22.4)

5.3 Factors affecting knowledge of the participants

Fifty-five of the participants responded that there is a lack of guideline in their institution. From these majority (76.3%) of them had inadequate knowledge score towards NR. Out of 76 participants who had no in-service training the majority of the participants (71.05%) had inadequate knowledge towards NR and similarly from a total of 55 midwives without ongoing supportive supervision most of them (76.36%) had inadequate knowledge towards NR.

The results of this study showed that there was no statistically significant association between the knowledge scores of the participants and their age, sex, marital status, monthly salary, level of education, work experience, or workload. However, there was a statistically significant association between the knowledge scores of the participants and their NR training, the availability of NR guidelines, and supportive supervision they received. Midwives who received neonatal resuscitation training were 2.4 times more likely to have adequate knowledge than those who had no training (AOD=2.47, 95% CI: 1.086-5.640, P-value=0.031). Participants who had neonatal resuscitation guidelines were 4.3 times more likely to have adequate knowledge than who had no guidelines (AOD=4.34, 95% CI: 1.78-10.59, P-value=0.001) and midwives who had supportive supervision were 3.3 times more likely to have adequate knowledge than those who had no (AOD=3.27, 95% CI: 1.38-7.74, P-value= 0.007) (Table 2).

Table 2.Factors affecting knowledge toward neonatal resuscitation in public health centers of Addis Ababa, Ethiopia, April, 2023.

Variable		Good n (%)	Poor n (%)	COR {95% CI}	AOR{95% CI}	P-value
Age	20-24years	10 (7.5)	10 (7.5)	1	1	
	25-29years	18 (13.4)	42 (31.3)	1.375 (0.388-4.867)	1.548 (0.265-9.050)	0.628
	30-34years	18 (13.4)	17 (12.7)	3.208 (1.106-9.307)	3.566 (0.790-16.103)	0.098
	35-39years	11 (8.2)	8 (6.0)	1.299 (0.421-4.006)	1.669 (0.370-7.530)	0.505
Experience	<5	28 (20.9)	36 (26.9)	1	1	
	5-9	18 (13.4)	33 (24.6)	1.768 (0.627-4.982)	1.129 (0.255-4.993)	0.873

	>=10	11 (8.2)	8 (6.0)	2.521 (0.859-7.398)	2.172 (0.495-9.537)	0.304
Guideline	Yes	44 (32.8)	35 (26.1)	4.062 (1.891-8.721)	4.343 (1.781-10.588)	**0.001**
	No	13 (9.7)	42 (31.3)	1	1	
Supervision	Yes	44 (32.8)	35 (26.1)	4.062 (1.891-8.721)	3.267 (1.379-7.737)	**0.007**
	No	13 (9.7)	42 (31.3)	1	1	
Training	Yes	35 (26.1)	23 (17.2)	3.735 (1.813-7.696)	2.474 (1.086-5.640)	**0.031**
	No	22 (16.4)	54 (40.3)	1	1	

Key: 1= Reference, COR= Crude odds ratio, AOR= Adjusted odds

5.4 Practice of the participant toward neonatal resuscitation.

This study revealed that poor practice (score less than 80%) toward NR among midwives were 73.1%. The mean score of the participants were 15.3 (SD±6.87) with maximum and minimum scores of 28 and 6 out of 30 practice questions respectively (Figure4).

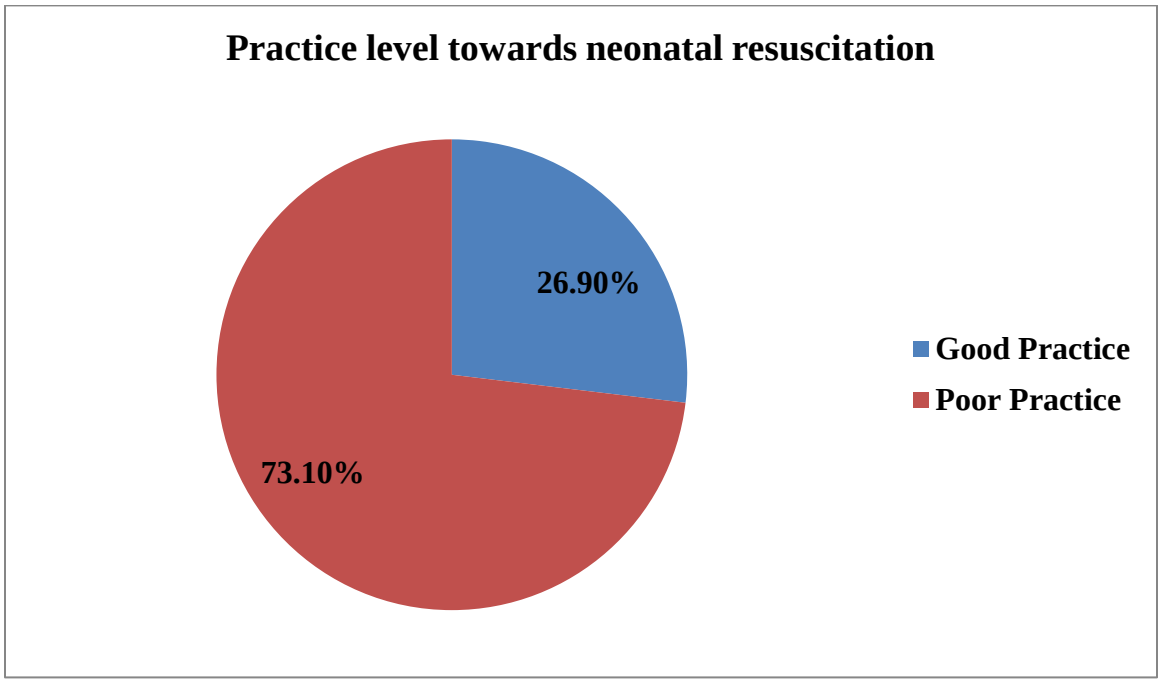

Figure 4:- Practice level of the participants towards neonatal resuscitation in public health centers of Addis Ababa Ethiopia, April, 2023.

Practice level of the participants in different steps

The practice questions that were most often answered were asses the baby for breathing and clear the babies' airway 116 (86.6%), 111(82.8) respectively. (**Table 3)**

Table 3: Response of participants in common practice questions towards neonatal resuscitation in selected public health centers Addis Ababa Ethiopia, April, 2023.

Questions	**Yes** **n (%)**	**No** **n (%)**
Collect the necessary materials	102 (76.1)	32(23.1)
Assess for color	94 (70.1)	40 (29.9)
Dry the new born	85 (63.4)	49 (36.6)
Administer the correct dose of drug	102 (76.1)	32 (23.9)
Apply chest compression	97 (72.4)	37 (27.6)
Assess need for chest compression	80 (59.7)	54 (40.3)
Assess need for ventilations	82 (61.2)	52 (38.8)
Assess the baby for breathing	116(86.6)	18(13.4)
Clear the Airway	111(82.8)	23(17.2)

5.5 Factors affecting practice level of the participants

Seventy six of the participants responded that they did not receive neonatal resuscitation training. From this majority (84.2%) had poor practice toward NR. Out of 55 midwives who had no resuscitation guideline (89%) had poor practice towards NR and 55 participants who had no supportive supervision (85.4%) had poor performance towards NR.

This study found that the practice scores of the participants were not significantly associated with their age, sex, work experience, workload, availability of resuscitation materials, or level of supervision. However there was a strongly association between the participants practice score and availability of training, neonatal resuscitation guideline and level of education. Lack of NR training, absence of NR guideline and level of education were associated with low level of performance. Midwives who had access to guideline in the workplace were 4.5 times higher likelihood good practice than those who had no guideline (AOD=4.57, 95% CI: 1.47-14.12, P-value= 0.009). Regarding to level of education, participants with degrees were 3.3 times higher likelihood of good practice than diploma holders (AOD=3.34, 95% CI: 1-11, P-value= 0.048). Midwives with in-service training had practices that were 3.3 times more adequate than those who did not (AOD=3.32, 95% CI: 1.17-9.4, P-value= 0.024).

Table 4: Factors affecting good practice toward neonatal resuscitation in public health centers of Addis Ababa Ethiopia, April, 2023.

Variable	Category	Good N (%)	Poor N (%)	COR{95% CI}	AOR{95% CI}	P-value
Age	20-24year	2 (1.5) 11	18 (13.4)	1	1	
	25-29year	(8.2)	49 (36.6)	4.154 (0.720-23.954)	3.488 (0.376-32.393)	0.272
	30-34year	17 (12.7)	18 (13.4)	2.056 (0.640-6.609)	2.410 (0.440-13.210)	0.311
	35-39year	6 (4.5)	13 (9.7)	0.489 (0.151-1.579)	0.632 (0.121-3.293)	0.586
Level of education	Diploma	29 (21.6)	57 (42.5)	1	1	
	Degree	7 (5.2)	41 (30.6)	2.980 (1.190-7.461)	3.34 (1.010-11.033)	**0.048**
Provide NR before	Yes	31 (23.1)	64 (47.8)	3.294 (1.173-9.245)	1.14 (0.326-4.011)	0.835
	No	5 (3.7)	34 (25.4)	1	1	

Experience	<5	13 (9.7)	51 (38.1)	1	1	
	5-9	16 (11.9)	35 (26.1)	2.288 (0.752-6.968)	1.16 (0.246-5.430)	
	>=10	7 (5.2)	12 (9.0)	1.276 (0.423-3.849)	1.04 (0.219-4.890)	0.965
Equipment	Yes	33 (24.6)	73 (54.5)	3.767 (1.062-13.363)	1.93 (0.423-8.829)	0.395
	No	3 (2.2)	25 (18.7)	1	1	
Guideline	Yes	30 (22.4)	49 (36.6)	5.000 (1.911-13.082)	4.57 (1.472-14.162)	**0.009**
	No	6 (4.5)	49 (36.6)	1	1	
Supervisio	Yes	28 (20.9)	51 (38.1)	3.225 (1.338-7.776)	1.57 (0.545-4.485)	0.4
n	No	8 (6.0)	47 (35.1)	1	1	
Work load	Yes	17 (12.7)	32 (23.9)	1	1	
	No	19 (14.2)	66 (49.3)	1.845 (0.847-4.021)	1.57 (0.549-4.485)	0.401
Training	Yes	24 (17.9)	34 (25.4)	3.765 (1.678-8.448)	3.32(1.172-9.389)	**0.024**
	No	12 (9.0)	64 (47.8)	1	1	
Spending	>8hr	24 (17.9)	54 (40.3)	1	1	
Hrs./ Day	<8hr	12 (9.00)	44 (32.8)	1.630 (0.733-3.624)	1.32 (0.490-3.546)	0.584

6. DISCUSSION

The study aimed to assess the knowledge and practice level of midwives towards NR in Addis Ababa Ethiopia. Prompt and effective resuscitation is essential for preventing death and disability in newborns secondary to birth asphyxia. Asphyxia-related infant mortality and morbidity is mainly caused by poor resuscitation, this resulted in a rapid decline in knowledge and skills, as well as poor retention of knowledge and competence after training.

This study revealed that adequate knowledge of NR among the midwives was 42.5%. This finding was supported by studies in northwest Ethiopia(46.5%) and Pakistan (49%) (30,38).

In contrary the knowledge score of this study was higher than studies in eastern Ethiopia and Kanyakumari district Hospitals in India 9.8% and 34% respectively (29,35). Lack of work place training, supportive supervision and the absence of neonatal resuscitation guidelines could all contribute to this discrepancy. However, the result of this study were lower than those of a study done in Ethiopia, where 87.3% of participants had adequate knowledge(39). This variation might the difference in institutional setup, with hospitals having more senior physicians and residents available and midwives in hospitals have more opportunities to learn from and observe the practice of these experienced professionals.

The mean knowledge score of the midwives in this study was (54.5%) which was similar study done in India which is 57.5% (41). This is lower finding when compared to similar study in South Wollo public hospitals which was (68.68%), but higher when compared to study in Gonder teaching hospital(42.8%) (36,37). This variation may result from the different level in institutional characteristics, educational and infrastructural difference in different hospital and country.

Knowledge score of midwives in this study significantly associated with their training in neonatal resuscitation, availability of guideline and supervision. This was in line with finding in Afghanistan found that training with supportive supervision was strongly linked to greater knowledge and also studies conducted in university of Gonder comprehensive hospital and south wollo northeast Ethiopia(37,38,44).

In this study the practice level of midwives was only 26.9% of good practice. This result were comparable with study done in public hospitals of South Wollo, Ethiopia which was 24.5% (37). In contrary the result higher than study done in Eastern Ethiopia(11.2%) and Nigeria (5%) of the participants were good neonatal resuscitation practice(10,32). But lower when compared with study done in Addis Ababa Ethiopia selected public hospitals; shows 89.2% (39). The participants' level of education, insufficient refresher training, and a lack of guidelines could all contribute to this low level of resuscitation practice.

The mean practice score of the participants in this study was 32.8%. This result was lower than studies done at South Wollo governmental hospitals in northeastern Ethiopia, 62.96%, and Gondar teaching hospital, which was 59.2%(36,37). The difference in quality of resuscitation training, exposure to neonatal resuscitated cases, and the setup of the institution may explain the discrepancy in practice scores. The study found that poor resuscitation performance was significantly associated with a lack of guidelines, training, and education among midwives. This could be because midwives without guidelines may not have access to the latest information or follow the correct steps to resuscitate newborns. Furthermore, without ongoing supervision, the practice level of midwives may decline over time, leading to poor NR practices.

This study found that the participants had poor knowledge and practice of NR, which could lead to poor resuscitation outcome and increased asphyxia related death and morbidity**.** As a result, midwives should receive simulation-based training, get access to resuscitation guidelines, and update their educational level.

7. LIMITATION OF THE STUDY

The main difficulty of the study was to assess practice level by using an interview rather than an observational checklist. The respondents may not have provided accurate information about the knowledge and practice questions since they were busy in working while the data were being collected.

8. CONCLUSION AND RECOMMENDATION

8.1 Conclusion

The overall knowledge and practice of midwifes were insufficient. Lack of training, unavailability of guideline and supportive were all significant factors that contribute to the poor knowledge score of midwives towards NR. While the level of education, resuscitation training and guideline were all associated with poor practice performance of midwives towards neonatal resuscitation.

8.2 Recommendation

The study's findings led to the following recommendations:-

- Health bureau should enhance midwives' in service training programs to improve their proficiency in neonatal resuscitation.
- Health center directors and managers in collaboration with sub cities and health bureau should strengthen continuous and regular training on NR for midwifes.
- Health center directors also need to facilitate periodic supervision, mentoring and evaluation to assess midwives knowledge and practice of NR.
- Delivery units should fulfill all necessary supplies, equipment's including resuscitation manuals.
- It is important to carry out simulation session on newborn resuscitation practice frequently

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ANNEXES

Annex I: Information Sheet and informed consent

Addis Ababa University, college of health sciences, department of Emergency Medicine and critical care

Questionnaire to assess Knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers Addis Ababa, Ethiopia.

Title of the project: Knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers Addis Ababa, Ethiopia.

Name of investigator: Tsegaye Yitayih

Name of the organization: Addis Ababa University, college of health sciences.

Introduction: The information sheet and consent form prepared by the investigator with the aim of explaining the research project that you are asked to join by the group of research investigators. The main aim of this research project is to assess knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers. Decision on your involvement will be made by you and only you. The investigator includes 4 data collectors, 1 supervisor and two advisors from Addis Ababa University, college of health sciences.

Purpose: To assess knowledge, practice and associated factors towards neonatal resuscitation and recommend possible interventions based on the finding.

Procedure: To assess knowledge, practice and associated factors towards neonatal resuscitation, you are invited to participate in the project. If you are willing to participate in this project you need to understand and sign the agreement form. Then you will be requested to give response to some questions that will take few minutes (about 30 minutes). All the responses given by you will be kept confidentially by using coding system whereby no one will have access to your response.

Risk: By participating in this study you may feel that it has some discomfort especially on wasting your time (20-30 minutes) to respond questions but this may not be too much as you are one of the member of the institution, your response will help as important input to determine the knowledge, practice and associated factors towards neonatal resuscitation. However there is no physical or psychological risk expected being involved in the study.

Benefits: If you participate in this study, you may not gain direct benefit but your participation will help us to know the level of knowledge and practice of health professionals towards neonatal resuscitation and to identify factors in neonatal resuscitation. Finally it helps to take measures based on the finding.

Confidentiality: Information about you will be collected without your name but a cod number assigned to it will be stored in a file and kept secured. Your personal information will only be used for the purpose of the study. Your response will be aggregated to yield summary data, but your individual response will not be reported.

Participation: You have to know that your participation is largely based on your willingness and approval. There are questions to be answered by you .you are expected to answer all of the questions but you have the right to say "no" and not participate in the study (you can choose not to respond to some or all of the questions). You have also a full right to withdrawal from this study at any time you wish without losing any of your right and without any penalty.

Person to contact: This research project will be reviewed and approved by the ethical committee of Addis Ababa University, college of health sciences, department of emergency medicine. If you want to know more information and ask any questions at any time you went you can contact with the following address.

1. Ms. Achamyelesh Tadele Addis Ababa University, college of health sciences.
2. Dr Finote Debebe Addis Ababa University, college of health sciences.
3. Dr Muluwork Dinberu Addis Ababa University, college of health sciences.

Email-tsegayitayih2@gmail.com

Phone No-0913014292

Greeting

How are you, I am Tsegaye Yitayih. I am studying my MSc in emergency medicine and critical care nursing in Addis Ababa University. I would like to ask you a few questions through self-administered questionnaire about your knowledge and practice of neonatal resuscitation. This will help us to assess knowledge and practice of neonatal resuscitation and the factors that associated with this. Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obligate to answer any question you do not wish to answer. If you fill discomfort with the questions, please fill free to drop it any time you want. These questions will take about 30 minutes. Could I have your permission to continue?

Informed consent Certified by

I Agree

Signature----------

Questionnaire Code NO…….

Name of interviewer…….

Date of interview……. Time started…….. Time ended……..

Annex II: Questionnaire to assess Knowledge, practice and associated factors towards neonatal resuscitation among midwives working in delivery room of public health centers Addis Ababa, Ethiopia.

Code_____ Date of data collection _____

Self-administered questions		
PART I: Questions related to socio-demographic and Providers characteristics.		
101.	Sex?	1. Male 2. Female _____
102.	Age in years?	_____
103	Marital status	1. Single 3. Divorced 2. Married 4. Widowed
104	Monthly salary	_____
105	Field of study/profession?	3. Midwifery. 3. HO 4. Nurse. 4. GP 5. Others specify_____
106.	Level of education?	1. Diploma 2. Degree 3. Masters
107.	Have you ever provided neonatal resuscitation?	1. Yes 2. No
108.	How many years have you provide neonatal resuscitation?	_____
Part II: Questions related to institutional characteristics		

201	Does your health center is fully equipped with resuscitation material? (A minimum of the following materials: Radiant warmer, bag with mask, suction	1. Yes 2. No 3. I don't know
202	Does your health center have neonatal resuscitation guidelines?	1. Yes 2. No 3. I don't know
203	Does your health center provide you supportive supervision?	1. Yes 2. No 3. I don't know
204	On average, for how many neonates you serve per day?	_____
205	Have you taken resuscitation training in the work place?	1. Yes 2. No
206	How many hours/days do you spend providing neonatal services?	_____

Part III: Knowledge Assessing questions		
301.	When you should be prepared to resuscitate the new born?	1. At every birth. 2. If we are sure that resuscitation is needed. 3. If there is anticipated risk only.
302.	To which new born does initial assessment is required?	1. All new born. 2. Only those who had perinatal/ Intrapartum risk factor. 3. Preterm fetus only. 4. Others (specify) _____
303.	What is the correct method of stimulating the new born?	1. Slapping/flicking the soles of the feet. 2. Slapping the back. 3. Squeezing the rib cage. 4. Holding upside down and shaking

304.	How much time is allotted for the initial steps of resuscitation?	1. 30 sec. 2. 40 sec. 3. 60 sec. 4. 90 sec.
305.	When do you stop the initial steps of resuscitation? (More than one answer is possible).	1. When baby is cried. 2. When breathing rate > 30beat/minute. 3. When the bay is gasping. 4. When Heart < 60beat/minute.
306.	When do you start Bag and mask ventilation? (More than one answer is possible).	1. Baby is not Breathing or is Gasping 2. Heart rate <100beat 3. Persistent cyanosis 4. Others
307.	What are the reasons for failure of bag & mask ventilation? (More than one answer is possible).	1. The seal is inadequate 2. The airway is blocked 3. Inadequate pressure 4. Inappropriate position
308.	What is the correct position of newborn's neck for resuscitation?	1. Slightly extended. 2. Flexed. 3. Hyper extended 4. Others
309.	Which mask size is appropriate for resuscitations of term & preterm babies respectively?	1. Size 1 &0. 2. Size 2 & 1. 3. Size 0 for both. 4. Size 1 for both.
310.	During resuscitation of the neonate by bag and mask, the mask should cover?	1. Mouth, nose and tip of chin but not the eyes. 2. Part of chin, mouth, nose and eyes. 3. Part of nose, mouth but not eyes and chin. 4. Parts of mouth, nose & chin but not the eyes.
311.	What are the indications to start chest compressions during neonatal resuscitations?	1. HR< 60b/m after bag & mask ventilation. 2. HR<100b/m after bag and mask ventilation. 3. Persistent cyanosis after initial resuscitation. 4. Apneic after initial resuscitation
312.	Which technique of chest compression is recommended during neonatal resuscitation?	1. Two thumps 2. Two fingers 3. One hand 4. Two hands
313.	What is the recommended ratio of chest compression to ventilation?	1. 3:1 2. 4:1 3. 3:2 4. 5:1

314.	For how long does cardio-pulmonary resuscitation (CPR) continued before reassessing heartbeat.	1. 15 sec. 2. 20 sec. 3. 30 sec. 4. 60 sec.
315.	What depth of chest compression you provide to produce the required pressure?	1. 1/3rd of anteroposterior diameter. 2. 2/3rd of anteroposterior diameter. 3.1/4th of anteroposterior diameter. 4. 3/4th of anteroposterior diameter.
316.	What are the indications to start medications (Epinephrine) during neonatal resuscitations?	1. Heart rate <60 b/m after 30sec ventilation & 60sec coordinated chest compression & ventilation. 2. Heart rate <100 with adequate ventilation & chest compression. 3.To all new born immediately after birth appearing cyanosed. 4. Others (specify)_____
317.	What is preferred medication during resuscitation?	1. Epinephrine 2. Naloxone 3. Steroids 4. Other (Specify)_____
318.	When does volume expander indicated during neonatal resuscitation? (More than one answer is possible).	1. If there is sign of shock. 2. If there is history of blood loss. 3. To all resuscitated babies 4. Other (specify) _____
319.	What is the preferred volume expander during resuscitation? (More than one answer is possible).	1. 0.9% NaCl 2. Unmatched type O Rh- packed RBC 3. Ringer lactate 4. Others (specify) _____
320.	After how many seconds you assess for the effects of Epinephrine?	1. After 20seconds of epinephrine. 2. After 30seconds of epinephrine. 3. After 40secconds of epinephrine. 4. After 60seconds of epinephrine.

Part IV: Participants Practice Assessment guide; please put sign (✓) on the space done if you perform the procedure and on not done if not performed.			Done	No
		1. Wash hands		

401.	In which way you prepare for resuscitations?	2. Tell the mother what is going to be done.		
		3. Collect the necessary materials.		
		4. Check functionality of the equipment.		
		5. Provide continual emotional support.		
		6. Others (Specify) _____		
402.	What do you do immediately after birth to determine the need for resuscitation?	1. Assess for gestational age.		
		2. Assess for color.		
		3. Assess for muscle tone.		
		4. Assess breathing.		
		5. Assess for amniotic fluid.		
		6. Others (Specify) _____		
403.	What do you do initially if the new born is not breathing?	1. Dry the new born.		
		2. Position the new born		
		3. Maintain thermo-regulations.		
		4. Provide tactile stimulation.		
		5. Clear the air way.		
		6. Others (specify) _____		
404.	What do you do to provide bag and mask ventilation?	1. Assess the need for ventilations.		
		2. Place the baby faces up on flat surface with neck slightly extended.		
		3. Place the mask on the face so that it covers nose, mouth and tip of chin.		
		4. Check the rise of chest with 2-3 ventilation.		
		5. Ventilate 40-60breath/minute.		
		6. Others (Specify) _____		
405.	What do you do to provide chest compression?	1. Assess the need for chest compression		
		2. Select the correct site for chest compression.		
		3. Provides back support throughout.		
		4. Apply chest compression.		
		5. Assess the response of the new born.		

		6. Others (Specify) _____		
406.	What do you do to give medication or volume expander?	1. Calculate the correct dose of medications.		
		2. Choose the correct size of syringe.		
		3. Draw the correct dose of the drug.		
		4. Administer the correct dose of drug.		
		5. Check heart rate after 30 sec. and repeat as Needed		
		6. Others (Specify) _____		