ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICE ABOUT IMMEDIATE NEWBORN CARE AMONG HEALTH CARE PROVIDERS IN ADDIS ABABA PUBLIC HEALTH CENTERS

A Thesis Submitted to college of Health Sciences, School of graduate studies

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ABSTRACT

Background: *Globally 4 million neonatal deaths every year, 75% (3 million) of this are in the first week and highest is in the first day of life. Ethiopia has Neonatal Mortality rate of 39/1000 LB (EDHS 2005) and contributes for more than 50% of infant mortality.*

Objective: *To assess knowledge, attitude and practice of health care providers and explore factors affecting provision of immediate newborn care in Addis Ababa public health centers.*

Methods: *This facility based cross sectional study is conducted from January to March 2011. The study used both quantitative and qualitative approaches; structured questioner for providers, observation of cases managed, in-depth interview of managers and record review.*

Results: *Over half (51.4%) of providers have satisfactory knowledge in immediate newborn care. The overall knowledge related to essential newborn care is better than care for LBW and sick newborn. Those with long years of service year, $\geq$ 10 years, have a better knowledge than others. Overall, the health providers interviewed had a very positive attitude towards newborn care interventions, 98.6% of the responses from the providers had good and very good attitude towards newborn care. The overall essential newborn care practice by providers in the last case they provided service is satisfactory, 80.7% had a correct practice. The overall extra care for premature or LBW practiced by providers in the last case they provided service was not satisfactory, only 40.4% did practice at least half of the standard actions.*

1. INTRODUCTION

Millennium Development Goal for child survival cannot be met without substantial reductions in neonatal mortality. Many countries including Ethiopia have set under-five and maternal mortality reduction as their key development goal. In preparing child mortality reduction strategies, it is important for countries to implement effective interventions strategy available to save lives of newborn babies in order to avoid newborn deaths more quickly [Darmstadt 'et al', 2005]. These interventions are bundled in very cost-effective way and it has the greatest effect on neonatal deaths and yet simple interventions. It's less dependent on technology and commodities than on people with skills [Haws 'et al', 2007].

Every year an estimated 4 million babies die in the first 4 weeks of life (the neonatal period). And three-quarters of neonatal deaths happen in the first week; the highest risk of death is on the first day of life. Almost all (99%) neonatal deaths arise in low-income and middle-income countries. The highest numbers of neonatal deaths are in south-central Asian countries and in sub-Saharan Africa. The countries in these their care was considered to be maternal regions (with some exceptions) have made little progress in reducing such deaths in the past 10–15 years [Lawn 'et al', 2005].

Although being newborn is not a disease, large numbers of newborn die soon after birth; especially neonatal deaths occur during the perinatal period. Intra partum deaths are closely linked to place of care at delivery. In addition, neonatal deaths and stillbirths stem from poor maternal health and the first critical hours after birth with lack of newborn care. Furthermore, services meet minimum standards for safe childbirth and newborn care, outdated knowledge and inadequate skills, lack of essential medicines, supplies and equipment, overcrowding and inadequate hygiene are common [WHO 2006]. The major causes of neonatal death globally were estimated to be infections (sepsis/pneumonia, tetanus, and diarrhea; 35%), preterm birth (28%), and asphyxia (23%) [Lawn 'et al', 2006].

The focus to neonatal health was delayed due to different reasons in past decades. Child survival approach lead by interventions targeting child beyond neonatal age; newborn and

issue and newborn health care was thought

to be provided with high technology as in the developed nations. Recently there are major shift made to the care in the neonatal period by implementing cost effective intervention.

Since Ethiopia is one of the poorest countries in the world, have multiple maternal and newborn health related problems like other developing countries. The neonatal health is not improving unlike health of less than five years old. Neonatal death account for more than 50% of the infant mortality and about 31% of under five morality [EDHS, 2005].

The health of newborn is affected by the magnitude of problems and quality of care. As described above, the risk of mortality is high during birth and in the early period of life. Clearly good essential care of the newborn will prevent many newborn emergences, like neonatal sepsis and tetanus infection by maintaining clean chain [Lawn 'et al', 2002].

The level of care during this risky period in Ethiopia is very low. According to the national EmONC baseline assessment, 2007_2008, the use of specific evidence based intervention is low; use of parental antibiotics for newborn is 24% and provision of extra care to premature or low birth weight is 24% [FMOH, 2008].

Now a day's, neonatal mortality is increasingly recognized as an important public health challenge and there is a shift of focus to newborn care to achieve MDG-4 through proven cost effective interventions. The implementation of these interventions is highly affected by the performance of health professionals so it is mandatory to know the knowledge, attitude and practice of health professionals [Qazi 'et al', 2009].

Since programs focusing on neonatal period are new in Ethiopia, study conducted in this area is very limited and specific. Conducting study on assessing the knowledge, attitude and practice of health care providers in different aspect of immediate newborn care are essential. It will also strategically contribute for designing programs, focusing on improving care and reducing neonatal mortality. The acceptance and utilization of new intervention in improving neonatal health can largely affected by many factors. This study do also explore factor that affect the knowledge, attitude and

practice of health care providers towards immediate newborn care.

2. LITERATURE REVIEW

2.1. Newborn Care Intervention Package

Newborn care Intervention package are effective interventions strategy available to save lives of newborn babies. The Newborn care Intervention package is divided in to three Intervention sub packages:-

- Essential Newborn care for all Babies Intervention sub package
- Extra Newborn care for LBW Babies Intervention sub package
- Emergency Newborn care for sick Babies Intervention sub package

Essential Newborn Care Intervention sub package is for every baby to have routine newborn care to enhance normal growth and development and to minimize risk factors for complications. The key interventions for essential newborn care includes: neonatal resuscitation, the clean chain (clean hands, clean surfaces, clean blade to cut cord, clean cord tie, clean cloth), the warm chain (dry baby, warm room, warm mother, wrap up, use hat), breast feeding, cord, eye, and skin care, immunization, Vitamin K and MTCT/HIV.

Extra Newborn cares for the LBW newborn sub package includes: identification of the LBW baby, extra clinical care of the LBW baby, extra support for feeding, extra support for warmth and provision of Vitamin K.

Emergency newborn care sub package for sick babies includes: identification of neonatal danger signs, severe neonatal infection, neonatal tetanus, neonatal asphyxia, neonatal jaundice, birth defects and giving appropriate emergency care for the sick newborn [Knippenberg ‘et al’, 2005; Post, 2006; Bridget ‘et al, 2007; Journal of Hospital Medicine, 2010].

2.2. Magnitude and Distribution of Newborn Health Problems

Under five and infant mortality rates are decreasing at a faster pace than neonatal mortality; consequently, neonatal deaths will represent an increasing proportion of child deaths [WHO 2006]. Every year over 4 million babies die in the first four weeks of life; 3 million of these deaths occur in the early neonatal period, about 75% of neonatal death occur in the first week of life. Ninety-eight per cent of the deaths take place in the developing world. In developing countries, the risk of death in the neonatal period is six times greater than in developed countries; in the least developed countries it is over eight times higher. With 41 neonatal deaths per 1000 live births, the risk of neonatal death is highest in Africa. The sub-Saharan regions of Eastern, Western and Central Africa have between 42 and 49 neonatal deaths per 1000 live births [Bahl 'et al', 2009; Shifman, 2010].

Ethiopia is one of the poorest countries in sub-Saharan Africa and has problem related to newborn health. As EDHS 2005 indicated there is progress in the reduction of under five than neonatal mortality [neonatal mortality 39/1000 LB; infant mortality 77/1000 LB and under five mortality 123/1000 LB [EDHS 2005].

2.3. Factor Affecting Newborn Care

Globally, 60–80% of neonatal deaths arise in low birth weight babies. The main direct causes of neonatal death are estimated to be infections (sepsis/pneumonia, tetanus, and diarrhea; 35%), preterm birth (28%) and asphyxia (23%). Neonatal tetanus accounts for a smaller proportion of deaths (7%), but is easily preventable. Low birth weight is an important indirect cause of death. Maternal complications in labour carry a high risk of neonatal death, and poverty is strongly associated with an increased risk [WHO and UNICEF, 2009].

Although effective and simple interventions for prevention of newborn death exist, it doesn't reach for the majority of neonates in the developing countries. With in sub-Saharan African and south Asian countries for which DHS data are available, the NMR is consistently higher and Lack of skilled personnel is one of the most important cause for neonatal death. Many Africa countries train insufficient numbers of providers and programs competes for in adequate health personnel. There is lack of standards for care in the health system and even those guidelines available at national level are not known by

majority of health providers. The poor management, lack of supervision and low pay for care providers are also contributes for low standard for care [Lawn ‘et al, 2002; Bahl ‘et al’, 2009].

Labour and the time around birth are the riskiest time in the human life cycle. Lack of immediate newborn care leads to neonatal problem like newborn infections, it claim an estimated 1.4 million lives each year. The risk of dying due to birth asphyxia is about eight times higher for babies in countries with very high NMRs [Bahl ‘et al’, 2009].

A series of reviews in the International journal of obstetrics and Gynecology in September 2009 summarize, Neonatal resuscitation in a facility could reduce mortality of term and intra partum related neonatal death by 30%. And studies also showed that it reduce death of preterm babies [Lawn ‘et al’, 2009].

A retrospective record review conducted in Gonder college pediatrics ward showed that Hypothermia was prevented by rubbing the newborn in dry cotton, towel and keeping under the radiant [Teshome & Dejene, 2005]. A randomized control trial conducted over one year period in Addis Ababa showed that survival for preterm low birth weight infant was remarkably better for the early kangaroo mother care group than the baby with conventional method of care in the first 12 hr and thereafter [Bogale 2005].

Universal (99%) coverage of cost effective newborn intervention packages could avert an estimated 41–72% of neonatal deaths worldwide. At 90% coverage, intrapartum and Postnatal packages have similar effects on neonatal mortality, two-fold to three-fold greater than that of antenatal. This intervention mostly affected by knowledge, attitude and practice (KAP) of health professional [Darmstadt ‘et al’, 2005].

A needs assessment at Tansen Mission Hospital in Nepal established gaps in knowledge, skills and attitudes of health professionals, contributing to the high neonatal mortality. After intervention, consisted of four teaching sessions, significant improvements were observed in all groups (nurses, doctors and community health workers) [Allen 2006]. A Study that documented the pre-service training of nurses on newborn care in Brazil showed scientific knowledge and technical skills are essential for a rigorous control of vital

functions to ensure the survival of newborns [Costa ‘et al’, 2010].

The Making Pregnancy Safer initiative project in Ethiopia that was piloted in four hospitals and 16 health centers provided training on EmOC and found that five year later the trained staff had improved over untrained staff in practical test score on both knowledge and skill for infection prevention, new born resuscitation and vacuum extraction [FMOH 2009].

Study conducted in Zambia to determine the association of ENC with all cause 7 day (early) neonatal mortality among the infants of less educated mothers compared to those of more educated ones. ENC training for health care workers is associated with decreases in early neonatal mortality; rates decreased from 11.2/1000 live births pre-ENC to 6.2/1000 following ENC implementation ($p<0.001$), who treat women with less formal education [Chomba ‘et al, 2008].

2.4. Importance of the Study

To reduce neonatal mortality and to achieve the Millennium Development Goal for child survival by 2015, much more needs to be accomplished. A study specific to KAP of immediate newborn care will strategically contribute for designing programs focusing on improving skilled care [Bahl ‘et al’, 2009].

In order to decrease the mortality caused by Asphyxia and to practice a scientific method for resuscitation. A descriptive cross sectional study was conducted in Sari, Iran, to determine the rate of knowledge, attitude and practice of every learner about neonatal resuscitation in the governmental hospitals. Results obtained suggest that 44.5% had good knowledge and 11.7% had very good knowledge on neonatal Resuscitation. The Data also suggested that 96.3% of the subjects had good and very good attitudes towards neonatal resuscitation and the results show that only 38.4% of the subjects under the study had a good level practice [Ahmady ‘et al’, 2005].

Ethiopia Federal Ministry of Health proposed implementation of high impact and cost effective child survival interventions in the child survival strategy for the country to reduce neonatal mortality, so as to reach MDG.

A study conducted in Ethiopia on knowledge, attitude and practice of the

health care providers about immediate newborn care are very limited and specific to single component of newborn care. This study can be used as a base line study. One of the key reasons for inadequate and ineffective interventions is lack of knowledge. This gap in knowledge can only be filled by appropriately targeted research [Bahl 'et al', 2009]. This study assessed the knowledge, attitude and practice of health care providers and factors affecting care provision so as to recommend possible action.

3. OBJECTIVES

3.1. General Objective

To assess knowledge, attitude and practice of health care providers and explore factors affecting provision of immediate newborn care in Addis Ababa public Health centers.

3.2 Specific Objectives

1. To identify the level of Health care providers' knowledge, attitude and practice about immediate Newborn care.
2. To explore factors affecting provision of immediate Newborn care by health care providers.

4. MATERIALS AND METHODS

Since the Ethiopian government prioritize maternal and newborn care and promotes facility based delivery care, this study would potential identify gaps related to providers capacity in provision of immediate newborn care. This study also indicates some other gaps in providing quality immediate newborn care that would be further investigated by others, it will provoke further study.

4.1. Study Setting

The study covered twenty four public Health centers which provide delivery and other MCH related services from all twenty six health centers that are owned by Addis Ababa city administration. Addis Ababa is the capital city of Ethiopia and sit of African Union & Economic Commission for Africa. The Addis Ababa city Administration is further structured into 10 Sub cities and 116 woreda. Based on 2007 census and annual growth rate of 2.1 percent, the estimated population of Addis Ababa for the year 2010 is 2,914,404 and women of reproductive age group accounts for 34.6% of the total population.

4.2. Study Design

It is a health facility based cross sectional study. The study uses both quantitative and qualitative approaches. The quantitative study section includes questionnaire and record review. The qualitative study section includes observation of cases managed and in-depth interview of the head of the facility.

4.3. Study Population

The source population was health care providers who were working in public health centre of A.A. The study populations were those health care providers who were engaged in immediate newborn care service provision in these facilities during the data collection period.

Inclusion criterion: Health care providers who were providing immediate newborn care were included in the study.

Exclusion criteria: Health care providers who were not providing immediate newborn care for more than three months were excluded from the study.

4.4. Sample Size Determination

4.4.1. Sample size for quantitative study

To determine the sample size to study health care providers' knowledge, attitude and practice about immediate newborn care, the formula for single population proportion used and the following assumptions made. A Significance level of 95% and 5% margin of error was taken.

The study on assessment of Knowledge, Attitude and Practice of health care provider about Neonatal Resuscitation in the Health centre in Sari-Iran showed a prevalence levels for knowledge, attitude and practice of 56%, 96% and 38% respectively [Ahmady 'et al', 2005].

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

Assumption

n= number of the study subjects

Z= is standardized normal distribution curve/value for the 95% confidence interval (1.96)

p = proportion of knowledge, attitude and practice of the health care providers about immediate newborn care (Knowledge, attitude and practice levels are 56%, 96%and 38% respectively)

d = the margin of error taken (0.05 taken)

Since expected population is less than 10000, population correction is done using the formula $n_o/(1+n/N)$

Non response rate=10%

Table 1: Sample size calculation for Knowledge, Attitude and Practice

Variable	Prevalence	Confidence Level	Degree of Precision	n_o	Sample size calculated	Non-response rate (10%)	Total sample size
Knowledge	56%	95%	0.05	378	114	11	125
Attitude	96%	95%	0.05	59	112	11	123
Practice	38%	95%	0.05	362	114	11	125

Of the three sections used to calculate the sample size, a larger sample size was found in a section for Knowledge and practice study (table 1). Therefore a sample size of 125 was considered as appropriate for this study. However, since the number of health care provider fulfilling the inclusion criteria in the study area did not reach 125, all health professionals (census) involved in provision of newborn care in all public health centers were enrolled in the study. Of the total 26 public health centers that are owned by the city administration, only 24 health centers that were providing delivery and other MCH serves during the time of data collection were enrolled in this study. The study managed to interview 109 out of 114 health care providers who were actively providing services during the time of data collection.

Service utilization data were extracted from all 24 public health centers of Addis Ababa by reviewing records for the time period of January 1st to December 31st, 2010.

4.4.2. Sample size for qualitative study

An in-depth interview was conducted with the head of each public health centers. Of the total eligible 24 public health centers in Addis Ababa, the head of all 24 facilities were interviewed.

The study planned to observe all newborns that were managed during the data collection periods. The study managed to observe 18 newborns that received care during data collection period.

4.5. Sampling Procedures

The list of facilities that were providing delivery and other MCH services was found from Addis Ababa Regional Health Bureau. A list of providers that were involved in neonatal care was received from the head of delivery/MCH department of the respective health centers. The maximum effort was done to ensure that all the providers involved in immediate newborn care provision during the study period were interviewed. The data collection was conducted during working hours in week days but data collectors reach to each health center as early as possible to make possible arrangements for interviewing night duty providers. The data collectors also reached those providers, not available during data collection, and arranged time for interview. An in-depth interview was conducted with the head of all 24 public health centers.

The data collection process was set up to facilitate that all newborns receiving care during data collection period are observed by data collectors. The registers available in the facility were identified to determine the source of data for record review.

4.6. Data Collection Procedure

The time and location for one-to-one questionnaire interview with health care provider was arranged based on convenience for each provider. The interview started with explaining the purpose of the study and after informed consent. The data collector preceded the interview with each part of the questioner. An in-depth interview with head of the facility was conducted on a time convenient at his/her office. All efforts were done to observe all newborn cases that received care during the day of data collection, interview with health care providers were reschedule a few times to observe these cases. The proper register identified and records of interest were reviewed from record.

The questionnaire was prepared and used in English. The data collectors were four BSc Midwifes and one BSc Nurse that have the technical knowledge about the subject of interest, capacity to understand the questioner and experience in data collection. The data collectors were trained on content of each questionnaire, data collection techniques and procedures. The data collectors further enriched their understanding through pretesting the instruments and ongoing support from the investigator. The detailed logistics and field schedule was prepared with data collectors.

4.6.1. Pre-test

Before conducting the study, pre test was carried out in one of non-governmental health centre called SIPAR MCH Health centre, which would not be included in this study. All parts of the study tools were tested for its clarity, understandability, completeness, and reliability. The questionnaire that assesses Knowledge, Attitude and Practice were administered for 10 neonatal health care providers. A two separate in-depth interview was conducted with the heads of labour and neonatal ward of the facility. Two cases were observed while receiving care during pretesting. Record review format was also pretested using General admission and discharge register along with maternity and delivery register. The questionnaires were reconstructed based on the additional information that was obtained during the pre-test.

4.7. Variables of the Study

This study focus on the Knowledge, attitude and practice of health providers about immediate newborn care, which are comprehensive and cost effective interventions provided to newborns to save life, prevent morbidity and mortality.

The independent variables that looked in the study are:

i. Socio demographic characteristics: Age and sex of the health care provider
ii. Professional category
iii. Service year of health care providers
iv. In service training

4.8. Operational Definition

The key danger signs in the newborn include: poor sucking or not sucking at all; inactivity or lethargy; fever or hypothermia; respiratory distress; convulsions; vomiting; abdominal distension; umbilical infection and baby very small.

Immediate Newborn Care: is care provided to a newborn immediately after delivery which includes the time between birth to 24 hours care.

Thermal care is keeping the baby dry, clean and warm and avoiding bathing within 24 hours after birth.

Intervention package: A group of evidence based interventions proven to be

individually effective in reducing neonatal mortality and are combined to apply to the same time period.

LBW (Low birth weight): Birth weight less than 2500gram.

Satisfactory Knowledge: Those health providers who correctly answer to at least half of the knowledge questions are categorized as having satisfactory knowledge.

Good Attitude: Those health providers who responded agree to strongly agree for attitude questions are categorized as having good attitude.

Satisfactory Practice: Those health providers who were able to provide half of the standard actions during the last care they provided services are categorized as having satisfactory practice.

4.9. Data Quality Management

In order to have credible result, it is very crucial to ensure the quality of data controls at all levels of design and implementation of the study. When the questionnaire was designed, attention was given to have standard questions which were stated in clear, complete and simple language. It was pre tested in similar population for clarity and sensitivity and then made necessary modifications. To ensure the quality of data, data collectors were senior BSc Midwife and Nurse, who were working in hospitals and NGO sector. The data collectors were trained on all data collection tools and procedures through reviewing, discussing and field testing the tools. A close supervision, daily visit by the investigator, was done on site during data collection period to ensure that quality information were collected and recorded. Proper coding of data carried out after the information was checked again for completeness and internal consistency. The investigator and data collector took corrective discussion. Remarks were given every day on how to minimize errors and took corrective actions timely.

4.10. Data Analysis

After all the necessary data collected, the collected data were cleaned, coded and entered using EPI-Info version 3.5.1,2008 then transferred to SPSS, recoding and categorizing made through transformation. Descriptive analysis of major dependent and independent variables are made through univariant analysis and frequency distribution produced accordingly. The association of the dependent variables to

socio-demographic, professional category, training and service year was tested using cross tab and logistic regression. Crude and adjusted OR with 95% confidence interval (CI) was seen to appreciate the level of association. The association of selected knowledge variable like the time that takes to clear the airway and stimulate breathing and treatment of neonatal jaundice was tested with training, professional category service year and age.

The level of Knowledge about immediate newborn care was assessed based on whether the providers know all intervention package of newborn care or not (Essential or Basic, Extra and Emergency newborn care). A criterion used to level whether the provider is knowledgeable or not are: if he/she answers all of the responses for questions related to classification (component); mention at least half of the options for multiple responses and correctly responded to questions with single response. The total knowledge score of providers is calculated from all the questions related to knowledge; range and median is also looked. To have satisfactory knowledge they have to answer at least 19 out of 38 knowledge questions correctly.

A scale of one for strongly disagree to four for strongly agree are used to evaluate providers attitude. A median attitude score is calculated and histogram is used to look for the distribution of the score. A provider is considered having good practice when he/she provides all essential/basic care to all newborns during labor and birth; diagnose and provide appropriate care for LBW and sick newborn consult seniors and refer cases timely.

The qualitative data for practical observation and in-depth interview of head of health centers are summarized thematically to relate with other section of the study.

4.11. Ethical Consideration

Ethical approval obtained from university of Haramaya and Addis Continental institute of public health. An official letter of cooperation was also obtained from Health Bureau of Addis Ababa City Administration, which communicated to each public health centre enrolled in the study. The study participants were informed about the purpose of the study and the importance of their participation in the study, and then verbal consent was

taken from each study participants to confirm willingness. In order to ensure confidentiality of respondents, their name was not mentioned. In the process of observing care for mothers and newborns, the data collector or investigator support and ensure proper care of those exposed to mismanagement or with serious complications.

4.12. Dissemination of Results

The result of the study will be communicated to the relevant organizations and submitted to Addis Continental institute of public health and to the school of public health in Haramaya. The study will be presented to relevant forums, professional conferences and workshops. A paper will be sent for publishing in one of the local scientific journals.

5. RESULT AND DISCUSSION

5.1. Result

5.1.1. Knowledge, Attitude and Practice on Immediate Newborn Care

5.1.1.1. General

A total of 109 health professionals, with a response rate of 95.6%, interviewed in all 24 public health centers. Three to eight providers, on average of five, providers interviewed from each health center. The average age of respondents is 31 years and most are females (78.9%). Almost equal proportion of Midwives (50.4%) and Nurses (49.6%) are interviewed for the study. The mean service year of providers interviewed is about 6 years. A little over one third (38.5%) of providers are trained on newborn care (table 2). Of those trained, 66.7% are trained in the last one year and 78.6% had training for duration of at least three days. The training content reported by those providers trained, included: resuscitation (95.2%), thermal care (47.6%), clean chain (45.2%), MTCT/HIV (33.3%), immunization (31.0%) and breast feeding (4.8%). There was no one reporting training on treatment of severe neonatal infection.

Table 2: Characteristics of immediate newborn care providers working in 24 public health centers of Addis Ababa, 2011

No.	Characteristics	Response	Frequency # (%)
1	Age (Years)	20 – 30	68 (62.4%)
		31 – 40	26 (23.9%)
		41 – 50	13 (11.9%)
		51 – 60	2 (1.8%)
		Mean = 30.7$\pm$ 7.8 years	
2	Sex	Male	23 (21.1%)
		Female	86 (78.9%)
3	Professional Category	Midwife – BSc	18 (16.5%)
		Midwife – Diploma	37 (33.9%)
		Nurse – BSc	16 (14.7%)
		Nurse – Diploma	38 (34.9%)
4	Service Year after last graduation	1 – 3	38 (34.9%)
		4 – 6	37 (33.9%)
		7 – 9	11 (10.1%)
		$\geq$ 10	23 (21.1%)
		Mean = 5.68 $\pm$ 1.12 years	
5	Ever trained on newborn care	Yes	42 (38.5%)
		No	67 (61.5%)

5.1.1.2. Knowledge

The knowledge of describing the interventions under each category of newborn care is low. Only 27 (24.8%) of the providers correctly classified the three newborn care interventions. Fifty one (46.8%) providers know all the interventions under essential newborn care. All the interventions under extra care for LBW and emergency newborn care are listed in 19.3% and 4.6% of providers respectively. Over half (55%) of the providers know all the components of clean chain (table 3).

Table 3: Knowledge of immediate newborn care providers on classification and packages of newborn care interventions working in 24 public health center of Addis Ababa, 2011

No.	Knowledge	Response	**Frequency # (%)**
1	Know classification of newborn care interventions	Yes	27 (24.8%)
		No	82 (75.2%)
2	Know interventions under essential newborn care	Yes	51 (46.8%)
		No	58 (53.2%)
3	Know interventions under extra care for LBW	Yes	21 (19.3%)
		No	88 (80.7%)
4	Know interventions under emergency newborn care	Yes	5 (4.6%)
		No	104 (95.4%)
5	Know components of clean chain	Yes	60 (55.0%)
		No	49 (45.0%)

The same proportion (96.3%) of providers correctly knows the first action for a baby with clear amniotic fluid or meconium stained amniotic fluid. The right time, < 1 minute, which takes to dry baby, clear airway and stimulates breathing, was reported by 35.8% of providers. Close to a quarter (28.4%) of providers know the time to clamp or tie cord, wait 1 to 3 minutes. Over half (57.8%) of providers listed at least half of the options for alternative methods to keep baby warm. The most commonly mentioned methods are: wrap up and use hat for baby (80.7%); dry thoroughly (79.8%) and keep baby skin to skin of mother (79.7%). The least mentioned method is post pond bathing for 24 hours (14.7%). Over ninety percent (92.7%) of providers interviewed know what to do for bleeding from umbilical cord, applying another tie between first one and baby skin. Though 105 (96.3%) of providers stated that Vitamin K should be given for all newborn, only 52 (47.7%)

know the correct dose for normal newborn. The two common vaccination given at birth, BCG and Oral polio, are known by 106 (97.2%) of providers. The knowledge for how to care baby eye and when to initiate breast feeding was found to be 77.1% and 89.9% respectively (table 4).

Table 4: Knowledge of immediate newborn care providers on Essential Newborn Care Interventions working in 24 public health centers of Addis Ababa, 2011

No.	Knowledge	Response	**Frequency # (%)**
1	First action for a baby with meconium stained amniotic fluid	Clear air way	105 (96.3%)
		Drying	12 (11.0%
		Breast feeding	10 (9.2%)
2	How long it take to dry baby, clear airway & stimulate breathing	< 1 minute	39 (35.8%)
		2 -3 minute	50 (45.9%)
		5 minute	14 (12.8%)
		≥ 10 minute	6 (5.4%)
3	Time to clamp or tie cord	Immediately	78 (71.6%)
		Wait 1 -3 minutes	31 (28.4%)
4	Alternative methods to keep baby warm	Dry thoroughly	87 (79.8%)
		Wrap up and use hat for baby	88 (80.7%)
		Warm mother	50 (45.9%)
		Warm the room	63 (57.8%)
		Baby skin to skin of the mother	76 (79.7%)
		Put under incubator	38 (34.9%)
		Post pond bathing for 24 hours	16 (14.7%)
5	Know how to care for baby eye (clean eye and give eye drop)	Yes	84 (77.1%)
		No	25 (22.9%)
6	When to start breast feeding?	Within one hour of delivery	98 (89.9%)
		After one hour of delivery	11 (10.1%)

The definition for LBW, weight < 2.5 kgs, is known by 93 (85.3%) of providers. Over half (54.1%) of providers listed at least three kinds of extra care for newborn weighs < 2.5 kgs. The most common kind of care listed by providers are: thermal protection (87.2%) and extra support to establish breast feeding (86.2%) followed by monitor ability to breast feed (59.6%) and ensure infection prevention (32.1%). Only 7 (6.4%) providers correctly responded to the dose of Vitamin K for LBW.

Only nine (8.3%) providers listed over half of the danger signs in newborn. The most common danger signs listed are: poor sucking (86.2%), respiratory distress (78.9%), fever or hypothermia (46.8%) and inactivity or lethargy (43.1%). Eighty nine (81.7%) providers are able to diagnose birth asphyxia using at least two of the criteria. The most common signs providers' looks for diagnosing asphyxia are depressed breathing (85.3%) and central cyanosis (63.3%), (table 5).

Over half (54.1%) of providers know on how to identify baby for resuscitation but only 11 (10.1%) and 24 (22.0%) know all the steps of resuscitation and at least half of the actions to do when baby fails to breath after ventilation respectively. Though a high proportion (88.1%) of providers knows on how to select the correct mask, it's only 42 (38.1%) providers who know what to do when resuscitating with bag and mask or tube and mask. Ninety Eight (89.9%) providers know the position of baby head, slightly extended, to open the airway. Over half (59.6%) of the providers know when to check heart rate, after 1 minute of ventilation, while breathing with bag and mask. In response to what the provider will do in case when bag and mask or oxygen is not available for resuscitation to save baby life, 70 (64.2%) mentioned mouth to mouth resuscitation with care. Over half (58.7%) of providers listed at least two of the newborn resuscitation practices that should be discouraged. Of those practices that should be discouraged, 94.5%, 54.1% and 37.6% of providers listed holding baby upside down, heavy suctioning of back of the throat and routine suctioning of mouth and nose of a well baby respectively.

Thirty one (28.4%) providers know at least half of the signs and symptoms of infection in newborn. Most providers listed hypothermia or hyperthermia (79.8%) and poor or no breast feeding (66.1%) followed by less movement or poor muscle tone (44.0%); restlessness or irritability (42.2%) and difficulty or fast breathing (41.3%). The most common action that the providers know for newborn with signs of infection are beginning antibiotics (71.6%) followed by referral (58.7%), continue breast feeding (44.0%) and keep airways open (22.9%). Close to two third (63.3%) of the respondents know at least three of the common way to prevent infection in neonate. The most common ways of prevention listed by providers are clean delivery (87.2%) followed by eye prophylaxis (60.6%), good cord care

(59.6%), treatment of STI in the mother during pregnancy (55.0%) and antibiotics for prolonged rupture of membrane (41.2%).

Table 5: Knowledge of immediate newborn care providers on Extra care for LBW and Emergency Newborn Care working in 24 public health centers, Addis Ababa, 2011

No.	Knowledge	Response	**Frequency # (%)**
1	Kind of extra care for newborn weighs <2.5 kgs	Ensure thermal protection	95 (87.2%)
		Support to establish breast feeding	94 (86.2%)
		Monitor ability to breast feed	65 (59.6%)
		Monitor baby for first 24 hour	12 (11.0%)
		Ensure infection prevention	35 (32.1%)
2	Danger signs in newborn	Poor sucking or not sucking well	94 (86.2%)
		Inactivity or lethargy	47 (43.1%)
		Fever or hypothermia	51 (46.8%)
		Respiratory distress	86 (78.9%)
		Convulsions	16 (14.7%)
		Vomiting	16 (14.7%)
		Abdominal distension	9 (8.3%)
		Umbilical infection	16 (14.7%)
		Baby very small	26 (23.9%)
		Jaundice, pale and bleeding	41 (37.6%)
		Serious abnormality	13 (11.9%)
3	How you diagnose birth asphyxia?	Depressed breathing	93 (85.3%)
		Floppiness	30 (27.5%)
		Heart rate <100 beats/minute	44 (40.4%)
		Central cyanosis	69 (63.3%)
4	Signs and symptoms of infection in newborn	Less movement	48 (44.0%)
		Poor or no breast feeding	72 (66.1%)
		Hypothermia or hyperthermia	87 (79.8%)
		Restlessness or irritability	46 (42.2%)
		Difficult or fast breathing	45 (41.3%)
		Deep jaundice	15 (13.8%)
		Severe abdominal distension	13 (11.9%)
		Others	2 (1.8%)
5	Actions when newborn presents with signs of infection:	Explain to mother or care giver	15 (13.0%)
		Continue breast feeding	48 (44.0%)
		Keep airways open	25 (22.9%)
		Begin antibiotics	78 (71.6%)
		Refer	64 (58.7%)
6	Prevention of infection in neonate:	Treatment of STI during pregnancy	60 (55.0%)
		Antibiotics for PROM	45 (41.3%)
		Clean delivery	95 (87.2%)
		Good cord care	65 (59.6%)
		Eye prophylaxis	66 (60.6%)

Twenty seven (24.8%) of providers are able to diagnose neonatal jaundice. Almost similar proportion (25.7%) of providers knows on how to treat neonatal jaundice. The most common treatment option mentioned was phototherapy (44.0%) followed by exchange transfusion (28.4%) and antibiotic therapy if infection is suspected (17.4%). Only 11 (10.1%) of respondents know at least three serious abnormalities of newborn.

5.1.1.3. Practice

The overall essential (basic) newborn care practice by providers in the last case they provided service is satisfactory, 80.7% had a correct practice. Only 22.0% of providers practiced at least two ways that helped the baby to cry or breath immediately after birth, majority (93.6%) did rub or massage the baby. The practice of drying and wrapping baby immediately after birth (97.2%) and Keeping the baby on the mother abdomen or chest immediately after birth (95.4%) are almost universal. At least half of the reasons why the newborn kept close to the mother was listed in 71 (65.1%) of providers, the reasons mentioned most by providers are for bonding (90.8%) followed by to keep baby warm (69.7%) and stimulate breast feeding (11.9%).The advice for immediate initiation of breast feeding, before the placenta is delivered/ immediately after birth, was given by 63 (57.8%) providers. 70.6% of the providers did bath the baby for the first time after 24 hours of birth (table 6).

The extra care for premature or LBW was provided by 68 (62.4%) of providers. The overall extra care for premature or LBW practiced by providers in the last case they provided service was not satisfactory, only 40.4% did practice at least half of the standard actions. Of those extra care services provided for premature or LBW in the last three months, the most common are thermal protection (89.7%) and support to establish breast feeding (88.2%) followed by ensuring infection prevention (22.9%) and monitor baby for the first 24 hours (14.7%).

Over three quarter (78.0%) of providers reported practice in neonatal resuscitation in the past three months. There is no provider that reported providing parenteral antibiotics for newborn infection in the last three months. The reasons listed for not having practice on provision of parenteral

antibiotics by all providers are: lack of supplies, equipment and drugs; no training related to care provision and management issues. All of the providers did practice testing for HIV and providing ARV for mothers and newborn. Though counseling on clean cord care during last postnatal visit was given by 105 (96.3%) providers, good postnatal care with at least half of the standard activities were performed in only 19 (17.4%) of providers. Checking and counseling for danger signs are practiced in only 11.0% and 4.6% of the providers respectively. The providers weighed baby and counseled skin to skin contact /warmth in 27.5% and 19.3% of cases respectively.

Table 6: Immediate Newborn Care provider Practice during the last care they provided in 24 public health centers, Addis Ababa, 2011

No.	Practice	Response	**Frequency # (%)**
1	What do you do for the baby to cry or breath easily immediately after birth?	Rubbed/massaged	102 (93.6%)
		Dried	22 (20.1%)
		Mouth cleared	17 (15.6%
2	Did you dry and wrapped baby immediately after birth?	Yes	106 (97.2%)
		No	3 (2.8%)
3	Where was the baby put immediately after birth?	Mother abdomen or chest	104 (95.4%)
		With someone else	4 (3.7%)
		Separate abdomen	1 (0.9%)
4	Did you advice to immediately breast feed the baby after birth?	Yes	63 (57.8%)
		No	46 (42.2%)
5	How long after birth was the baby bathed for the first time?	6 hours	17 (15.6%)
		24 hours	77 (70.6%)
		72 hours	8 (7.3%)
		Don't know	7 (6.4%)
6	Provided extra care for premature or LBW	Yes	68 (62.4%)
		No	41 (37.6%)
7	Of those who do practice extra care for LBW, kind of care	Thermal protection	61 (89.7%)
		Establish breast feeding	60 (88.2%)
		Monitor breast feeding	50 (73.5%)
		Monitor baby for 1st 24 hours	10 (14.7%)
		Ensure infection prevention	25 (22.9%)
8	Has neonatal Resuscitation with bag and mask been performed in the last three months	Yes	85 (78.0%)
		No	24 (22.0%)
9	Has parenteral antibiotics given for newborn with infection in the last three months	Yes	0
		No	109 (100%)
10	HIV rapid testing been performed and ARV given to mothers & newborns in the last three months	Yes	109 (100%)
		No	0

5.1.1.4. Attitude

One hundred three (94.5%) providers said providing newborn care is part of their job. 100 (91.7%) of the respondent said they are happy to practice neonatal care. 101 (92.7%) of the respondent said they are willing to give care for neonate in the future. The reasons mentioned by those not happy to practice neonatal care or not willing to give care for neonate in the future are work load, lack of equipment and supply and low salary.

Overall, the health providers interviewed had a very positive attitude towards newborn care interventions, 98.6% of the response from the providers had good and very good attitude towards newborn care. Almost all agree to strongly agree for care related to maintaining clean and warm chain; screening for HIV and giving ARV and immediate initiation of breast feeding. Only few providers (4.6%) disagree for avoiding bath within 24 hrs of birth and provision of Vitamin K for all newborn, the others agree to strongly agree for these interventions (table 7). An average attitude score of 27.5 (out of 28) is found and more skewed distribution towards positive attitude is seen (figure 1).

Table 7: Attitude of immediate newborn care provider to the newborn care interventions in 24 public health centers, Addis Ababa, 2011

No	Do you agree:	Frequency # (%)			
		Strongly agree	Agree	Disagree	Strongly disagree
1	To Maintain clean chain?	108 (99.1%)	1 (0.9%)	0	0
2	To Maintain warm chain?	107 (98.2%)	2 (1.8%)	0	0
3	To avoid bathing of baby within 24 hours after birth	96 (88.1%)	8 (7.3%)	5 (4.6%)	0
4	To give Vitamin K for all newborn?	95 (87.2%)	9 (8.3%)	5 (4.6%)	0
5	To give screening test for the mother?	107 (98.2%)	2 (1.8%)	0	0
6	To give ARV to newborns in the maternity/labour ward (MTCT/HIV)?	105 (96.3%)	4 (3.7%)	0	0
7	To counsel postpartum woman on immediate initiation of breast feeding?	102 (93.6%)	6 (5.5%)	1 (0.9%)	0

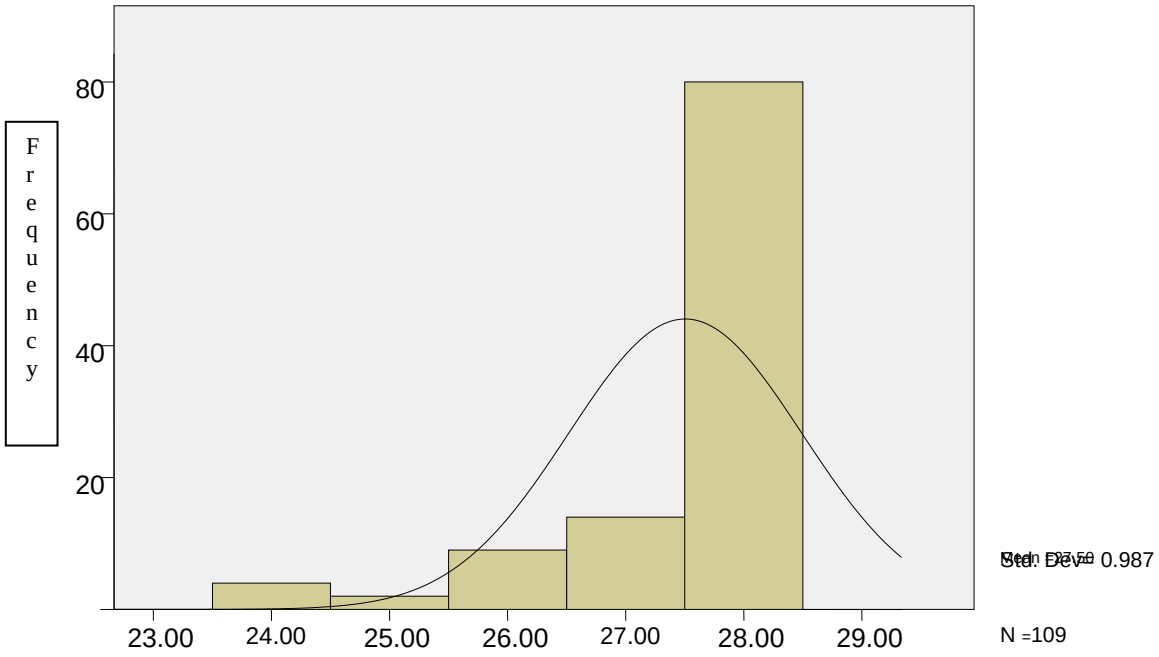

Figure 1: Attitude Score of immediate newborn care providers to the newborn care intervention in 24 public health centres, Addis Ababa, 2011

5.1.2. Practical Observation

A total of 18 cases were observed during the data collection period. Of these, 16 (88.8%) are essential care for newborn immediately after birth and the other two are care for LBW and neonate with complications. Most of these cases were attended by midwife (61.11%) and the remaining cases (38.9%) are attended by nurses.

During labor and birth; proper support to mother and newborn and maintaining clean chain was done in 83.3% and 77.8% of the cases respectively. The provider supported early initiation of breast feeding and gave proper cord and skin care in 27.8% and 66.7% of the cases respectively. Provision of Vitamin K, Immunization and MTCT/HIV services are observed in 83.3%, 94.4% and 100% of the cases respectively. The other observations are: suturing episiotomy without giving anesthesia in nine cases; lack of clean clothes in 15 of the cases and lack of Vitamin K and TTC eye ointments in three and one facilities respectively. Overall,

good basic care was given to 55.6% of the cases observed during the study period.

The only case of neonate with LBW was not given appropriate care. In most of the health centers there was no heater or cotton cloth. A case of neonate with complication observed during the study period was referred to higher facility for appropriate care. Most of the health centers are not ready to respond to emergencies. In most of the health centers, there was no neonatal corner.

Except in one case, findings from all the other cases (94.4%) were properly recorded on the registration book.

5.1.3. Interview with Key Informant (Head of Health Center)

The type of immediate newborn care services provided by health centers are listed by head of the facilities. Except thermal care (37.5%) and resuscitation (50.0%), all the other essential care services are available in all health centers. All the health centers reported that they don't have services related to care for LBW or for the sick.

The most common problems in provision of immediate newborn care listed by head of the facilities are related to lack of supplies and equipment followed by lack of trained staff and budget. Twenty one (87.5%) of the health centers reported stock out of supplies/equipment to give immediate newborn care. Twenty (83.3%) facilities reported having at least one trained provider. A total of 50 providers have been trained in these facilities, an average of two providers are trained in each health center.

Fourteen (58.3%) health centers have protocols for management of obstetric and newborn complications. Eighteen (75.0%) health centers have protocol on essential newborn care. All managers of study facilities responded that immediate newborn care is a priority for their facility. Three fourth (75.0%) of managers interviewed said that the quality of immediate newborn care services has improved during the past one year. The changes in quality of immediate newborn care services listed by managers are: procurement of drugs and equipments; facilitation of training and assignment of staff. Almost all managers would like to improve immediate newborn care services in their facility through training and assigning staff; allocating more budgets; improving supply and equipment and establishing neonatal corner.

5.1.4. Record Review

All the registers are looked for information's related to delivery and immediate postnatal care. Each health center have at least two register with key information related to immediate newborn care. The type of register are Maternity and delivery register (24, 100%); General admission and discharge (20, 83.3%); Postnatal (9, 37.5%); Referral (5, 28.8%) and HMIS (3, 12.5%). The quality of data was also looked in these facilities: missing data reported only in four health centers and all the health centers have up to date information in their registers

A twelve month (one year) service utilization data was collected from all 24 study health centers. A total of 20,007 deliveries registered in these facilities. The average delivery per facility per year is 834. The median number of deliveries reported in all facilities per month is 69 ± 4, no special variation observed in month (figure 2). The few of institutional based quality and outcome indicators are: newborn complication rate of 0.3 per 100 live births; LBW rate of 4.0 per 100 live births and still birth rate of 7.7 per 1000 total deliveries (table 8).

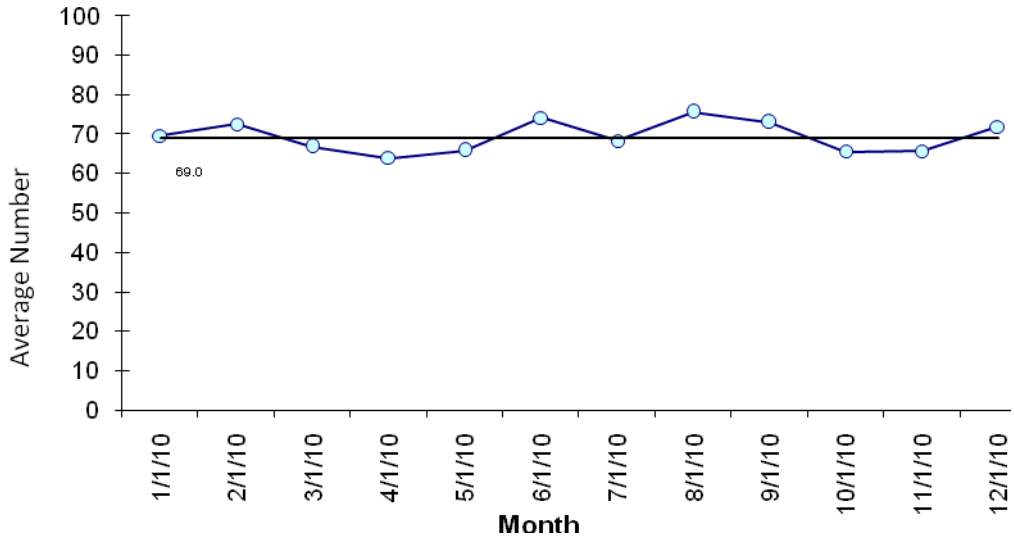

Figure 2: Average number of deliveries per month in 24 public health centers of Addis Ababa, 2011

Table 8: Service related to immediate newborn care provided from the period of January to December 2010, in 24 public health centers of Addis Ababa

Number of cases received care during a year (January to December 2010)		
Services	# of HCs reporting	Total # of cases in a year
1. Delivery	24	20,007
2. Mode of Delivery		
2.1. Normal (SVD)	24	19,952
2.2. Instrumental (Forceps & vacuum)	10	55
3. Live births and Deaths		
3.1. Still Births	22	154
3.2. Live Births	24	19,853
3.3. Early Neonatal deaths	4	10
4. Preterm and LBW		
4.1. Preterm	2	2
4.2. LBW	23	800
5. Newborn Complications		
5.1. Asphyxia	7	51
5.2. Aspiration Pneumonia	0	0
5.3. Sepsis	0	0
5.4. Congenital Anomalies	2	5

5.1.5. Factors Affecting Providers Knowledge, Attitude and Practice

The median knowledge score for knowledge is 19 out of 38 and range from 9 to 31. Based on the total average score for knowledge, 51.4% of providers have satisfactory knowledge. Those who are trained on newborn care, midwife by profession and long years of service looks more knowledgeable than the other group. The result is only significant for those with ten and over years of service (table 9).

The knowledge of providers on how long should it take to dry baby, clear air way and stimulate breathing is slightly more in ever trained than not trained; midwives than nurses and those with 7 - 9 years service than the other but the result are not significant (table 10).

Table 9: Association of immediate newborn care provider's knowledge on immediate newborn care with training, professional category, service year and age working in 24 public health centers, Addis Ababa, 2011

Variable	Response	Knowledgeable, (#,%) N = 109			Crude OR with 95% CI	Adjusted OR with 95% CI
		Yes	No	Total		
Ever Trained	Yes	24 (57.1%)	18 (42.9%)	42	1.46 (0.67-3.17)	1.27 (0.53-3.04)
	No	32 (47.8%)	35 (52.2%)	67		
Professional category	Midwife	31 (56.4%)	24 (43.6%)	55	1.50 (0.70-3.19)	0.87 (0.37-2.07)
	Nurses	25 (46.3%)	29 (53.7%)	54		
Service year	1 -3	19 (50.0%)	19 (50.0%)	38	1.88 (0.73-4.67)	1.86 (0.70-4.94)
	4 -6	13 (35.1%)	24 (64.9%)	37	1	1
	7 -9	7 (63.6%)	4 (36.4%)	11	3.23 (0.80-13.12)	3.06 (0.73-12.84)
	10+	17 (73.9%)	6 (26.1%)	23	5.23 (1.66-16.52)	4.15 (1.19-14.50)*
Age	20 – 30	31 (45.6%)	37 (54.4%)	68	1	1
	31 – 40	15 (57.7%)	11 (42.3%)	26	1.19 (0.07-19.88)	1.28 (0.46-3.51)
	41 – 50	9 (69.2%)	4 (31.8%)	13	1.63 (0.65-4.05)	2.10 (0.53-8.38)
	51 – 60	1 (50.0%)	1 (50.0%)	2	2.69 (0.75-9.57)	0.71 (0.04-13.93)

*- Made to show statistical significant association. 1- is representing referent

Table 10: Association of Knowledge of immediate newborn care providers on how long should it take to dry the baby, clear the airway and stimulate breathing by training, professional category, service year and age working in 24 public health centers, Addis Ababa, 2011

Variable	Response	Knowledgeable, (#,%) N = 109			Crude OR with 95% CI	Adjusted OR with 95% CI
		Yes	No	Total		
Ever Trained	Yes	17 (40.5%)	25 (59.5%)	42	1.39 (0.63-3.01)	1.18 (0.49-2.85)
	No	22 (32.8%)	45 (67.2%)	67		
Professional category	Midwife	23 (41.8%)	32 (58.2%)	55	2.08 (0.49-8.79)	0.62 (0.26-1.51)
	Nurses	16 (29.6%)	38 (70.4%)	54		
Service year	1 -3	11 (28.9%)	27 (71.1%)	38	1	1
	4 -6	12 (32.4%)	25 (67.6%)	37	1.18 (0.44-3.15)	1.40 (0.50-3.95)
	7 -9	6 (54.6%)	5 (45.5%)	11	2.95 (0.74-11.69)	2.93 (0.72-11.92)
	10+	10 (43.5%)	13 (56.5%)	23	1.89 (0.64-5.57)	1.79 (0.54- 6.01)
Age	20 – 30	24 (35.3%)	44 (64.7%)	68	1	1
	31 – 40	8 (30.8%	18 (69.2%)	26	1.23 (0.47-3.24)	1.32 (0.46-3.79)
	41 – 50	6 (46.2%)	7 (53.8%)	13	1.93 (0.49-7.61)	1.98 (0.47-8.23)
	51 – 60	1 (50.0%)	1 (50.0%)	2	2.25 (0.13-40.65)	2.51 (0.12-52.44)

1- is representing referent

Those who are trained on newborn care, midwife by professional and long years of service looks more knowledgeable on treatment of neonatal jaundice than the other group. Before adjusting, the difference is significant among trained, those who are midwives and with ten and over years of service. But after adjusted, the adjusted odds ratio, only service years has significant relation with treatment of jaundice. The knowledge of providers on treatment of jaundice increases with increase in service years (table 11).

Table 11: Knowledge of immediate newborn care providers on treatment of neonatal jaundice by training, professional category and service year working in 24 public health centers, Addis Ababa, 2011

Variable	Response	Knowledgeable, (#,%) N =			Crude OR with 95% CI	Adjusted OR with 95% CI
		Yes	No	Total		
Ever Trained	Yes No	17 (40.5%) 11 (16.4%)	25 (59.5%) 56 (83.6%)	42 67	3.46 (1.42-8.46)	2.37 (0.91-6.20)
Professional category	Midwife Nurses	20 (36.4%) 8 (25.7%)	35 (63.6%) 46 (85.2%)	55 54	3.29 (1.30-8.33)	2.72 (0.91-7.71)
Service year	1 -3 4 -6 7 -9 10+	7 (18.4%) 7 (18.9%) 3 (27.3%) 11 (47.8%)	31 (81.6%) 30 (81.1%) 8 (72.7%) 12 (52.2%)	38 37 11 23	1 0.97 (0.30-3.10) 1.61 (0.34-7.66) 3.93 (1.23-12.54)	1 1.38 (0.39-4.87) 1.38 (0.27-7.22) 3.63 (1.05-12.53) *

*- Made to show statistical significant association. 1- is representing referent

5.2. Discussion

The three newborn care intervention packages are: essential newborn care for all babies, extra newborn care for LBW babies and emergency newborn care for sick babies. Universal implementation of these intervention packages could avert up to 41-72% of neonatal death.____The implementation of these interventions is highly affected by the performance of health professionals which could mostly be related to knowledge, attitude and practice (KAP) of health professional.

A study conducted in Ethiopia on knowledge, attitude and practice of health care providers in relation to immediate

newborn care are very limited and specific to single component of newborn care. This facility based cross sectional study is conducted to assess the knowledge, attitude and practice of health care providers and explore factors affecting care provision. The study could be used as a base to strategically design facility based newborn care interventions.

The study included administration of questioner to all providers involved in newborn care provision; observation of cases managed during data collection period; interview head of health centers and review one year service utilization data from the facilities. A total of 109, with response rate of 95.6%, providers were responded to questioner and 18 cases observed while receiving care. The head of all public health centers (24) were interviewed and data on service utilizations extracted from all these facilities.

Of those with ten and more years of service, 61% are Midwives. Similar (61%) proportions of providers with less than four year of experience are with BSc education. This is related to both the current system for higher education and the previous training program for nurse midwife. It's only 42 (38.5%) providers, similar to what managers reported (50), received training on newborn care. The training on newborn care with focus on neonatal resuscitation in the last year relates with focused program effort to address the common neonatal health problem, Asphyxia. This figure of trained providers is a little higher than what is found in 2008 national EmONC assessment, 24% of providers received in-service training on neonatal resuscitation. This is also reflected on availability of neonatal resuscitation services in over three fourth of the facilities (83%). The availability of neonatal resuscitation is higher than what the national EmONC assessment reported for the health centers, 41%. The study in Zambia even showed a higher level impact of the training, a decrease in early neonatal moratlity from 11.5 to 6.8 deaths per 1000 LB [Waldemar 'et al' 2010].

Though infection is the major cause of neonatal death, no one had training related to managing neonatal infection and there is no health center providing paraenteral antibiotics or managing sick newborn. This figure is lower than what is reported in national EmONC assessment, 15% of health centers provided parenteral antibiotics for newborn during three month before the survey. These figures are very low compare to what other countries are

reached to expand the services to the community level.

The health centers in Addis Ababa are attending over one third of births expected in the city. This could be related to easy access and strong referral system. Almost all health centers are attending normal deliveries and serious cases seems to go for higher facilities. The findings on complication and still birth rate of 0.3 per 1000 LB and 7.7 per 1000 total deliveries respectively are very low compare to other national studies; national EmONC study found a still birth rate of 22/1000 total deliveries at health center level.

Based on the total average score for all knowledge related variables, little over half (51.4%) providers have satisfactory knowledge and this figure varies for different component of newborn care interventions. Though midwives and those trained on newborn care looks to have a better total average score, significant relation is only observed in those with service year ten and over. This could be related to: most of those who are ten and over years of experience are midwives; strong nurse midwife training program in previous years and poor quality of pre-service education in the recent years. The overall knowledge related to essential newborn care is better than care for LBW and sick newborn.

Overall, the health providers interviewed had a very positive attitude towards newborn care interventions, 98.6% of the responses from the providers had good and very good attitude towards newborn care. This figure is higher than what the study in Sari, Iran, reported; 96.34% had good to very good attitudes towards neonatal resuscitation.

The overall essential newborn care practice by providers in the last case they provided service is satisfactory, 80.7% had a correct practice. The overall extra care for premature or LBW practiced by providers in the last case they provided service was not satisfactory, only 40.4% did practice at least half of the standard actions. This figure is almost similar to what the national EmONC assessment in 2008 found; average score of 2.5 out of 5 for essential care and similar proportion in terms of different care components; most common care practiced were thermal protection and support to establish breast feeding.

The quality of postpartum/post natal counseling seems poor. Though 96.3% of providers did counseling in the last three months before the study, only 17.4% of

providers were able to perform at least half of the standard list of activities.

In the cases observed while receiving care in the facilities, good care was given to 55.6% of the cases. Since most cases observed were essential care (89%) for newborn, the overall care observed was much lower than what they reported in their practice in the last case they attended. This figure is higher than what the study in Sari, Iran, reported; only 38.4% had good level of practice.

The steps of clearing airway and drying baby immediately after birth are known by most (96.3%) of the providers. Almost all (97.2%) providers dried and wrapped the baby immediately after birth during the last time they attended birth. The knowledge and practice of these basic newborn cares are almost universal.

The provider's knowledge of the time for critical step is limited; time to clear airways is known only by 35.8% of providers. The sense of emergency to prepare and respond depends on knowing the right time to wait or act. This limited knowledge could lead to complications and delay in referral to higher facilities.

Though over half (57.8%) of providers know most of the methods to keep the baby warm, post pond bath for 24 hours is indicated in only 14.7% of providers. Over two third (70.6%) of providers did bath the baby for the first time after 24 hrs of birth during the last time they attended birth.

Though most (89.9%) of the providers know on when to initiate breast feeding; only 57.8% advice for immediate initiation of breast feeding in the last birth they attended and 27.8% supported early initiation of breast feeding in the cases observed. The differences in knowledge and practice related to initiation of breast feeding could be related to roles of providers, flow of care and assumption that the mothers know it.

The universal knowledge and availability of immunization and PMTCT services are related to focused program efforts and supports. In those cases observed while receiving care, 94.4% and 100% received immunization and PMTCT services. Vitamin K was also given to 83.3% of those cases observed.

In the year before the survey, one year service data from the facilities, the rate of LBW in the study facilities was found to be 4.0 per 100 LB. Over half (54.1%) knows the kinds of care for newborn who weighs <2500kgs. Though close to two third (62.4%) of providers reported practice of caring newborn with LBW in the last three

month before the survey, the managers feel that there is no extra care services for LBW in their facilities. The national EmONC assessment also showed a lower rate, 16%, of care for LBW at the health center level.

The providers have better knowledge on danger signs of newborn related to respiratory problems than LBW newborn and baby with infection. Over eighty percent (81.7%) of providers have a good knowledge on how to diagnose asphyxia. Though over half (54.1%) know on how to identify baby for resuscitation, only 10% know all the steps for resuscitation. This figure is almost similar to what is reported in Sari, Iran, study; 44.5% have good and 11.7% very good knowledge about neonatal resuscitation.

The providers interviewed have better knowledge on how to prevent infection (63.3%) than actions for newborn with sign of infections (36.7%) and listing most of the signs and symptoms of infection in newborn (28.4%). This figure is similar to what the 2008 national EmONC assessment indicated; low average score for action (2.1 out of 5) and for signs and symptoms of infection (3.1 out of 7). This could be related to the content/curriculum of pre-service education for midlevel providers and lack of in-service training program focusing on managing infections in newborn.

The effort to improve the quality of newborn care services in some of the health centers focused on ensuring supplies/equipment, training and assigning staff. 87.5% and 20.8% of health centers reported stock out of supplies/equipment and lack of trained provider respectively. Three fourth (75%) and over half (58.3%) of facilities have protocols for essential newborn care and management of newborn complications respectively. The registration books for keeping information on newborn care services are complete and of good quality in most of the facilities.

Strength and Limitation of the Study:

The strengths of the study are:

- Comprehensiveness (all components of care) of the study to assess KAP of providers in newborn care
- Looked complementary areas: observation of case management, review of service records and interview of facility managers
- Inclusion of all public health centers providing newborn care services
- Inclusion of all health professionals who are involved in newborn care service provision

The limitations of the study are:

- Since the study on KAP of providers in immediate newborn care are limited and focused, it was not easy to design some of the study sections and compare results.
- Since the study is on KAP, it is not easy to find standards that defines the cut off point for satisfactory knowledge, attitude and practice for providing newborn care services and compare across different study settings
- Though the study focused on KAP of providers at health center level, it also included observation of care provision, review of records and interview of facility managers. But this study is not exhaustive enough to identify factors affecting KAP of providers. Other enabling or restraining factors like facility infrastructure, equipment/supplies, set up of services, management and policy issues were not looked in detail in this study.

6. CONCLUSION AND RECOMMENDATIONS

Those who serve long years, $\geq$ 10 years, have a better knowledge than others. Those with long years of service are more midwives than nurses. The knowledge for prevention is better than clinical care component for newborn care intervention.

- Improve quality of pre-service education and ensuring adequate exposure for clinical practices
- Assigning midwives for obstetric and newborn care services

A little over one third (38.5%) of providers had focused training on neonatal resuscitation, those trained have better knowledge than non trained providers. The report on improved performance, availability (78%) of neonatal resuscitation services, is related to the proportion of facilities with trained providers (83%). Though providers are trained on one of the major cause of neonatal death, asphyxia, they are not trained on the other two major causes of deaths, infection and LBW.

- Organize comprehensive in-service training program to address all the major causes of neonatal deaths.
- Encourage trained providers to transfer knowledge and skill to others and organize on job training.

The knowledge and practice for essential care are better than for LBW and sick newborn. A clear gap is observed in

knowledge and practice in some of the newborn care intervention. Though providers have good attitude for newborn care, most couldn't able to put it in to practice what they know.

- Create an enabling environment for providers to practice what they learn and know

The vertical programs with a lot of efforts and resources are doing well. Almost all health centers have testing services for HIV and provide ARV.

- Integration of services to ensure that all clients are getting comprehensive care and available resources are used effectively.

The effort to improve quality of newborn care services included a few traditional approaches of procuring supplies/equipment and training providers.

- Introduce a system of continuous quality improvement in the facilities.

The study mainly focused on providers KAP at health center level, which indicated some of the gap in provision of quality immediate newborn care that relates with the provider at health center level. But most of the factors related to level of care, facility infrastructure, management and policy issues are not captured in this study.

- Conduct comprehensive study to assess quality of immediate newborn care services by including all levels of care and issues related to facility infrastructure, management and policy.

Conclusionand Recommendations:

The knowledge and practice for essential care are better than for LBW and sick newborn. A clear gap is observed in knowledge and practice in some of the newborn care intervention.

- Improve quality of pre-service education, organize comprehensive in-service training program and encourage trained providers to transfer knowledge and skill to others.
- Create an enabling environment and introduce a system of continuous quality improvement in the facilities.

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ACKNOWLEDGEMENTS

I would like to thank my advisor, Dr ALEMAYEHU WORKU, for his ongoing support and constant comment throughout my thesis work.

I would also like to extend my gratitude to all of Addis Continental staff especially my instructors and those working in Library and Computer Lab., for their encouragement and support during the whole research process.

My special thanks go to Professor BOGALE WORKU, for his critical review, comment and support in the thesis work.

I would also like to express my respect and appreciation to all my close relatives and friends who showed their love and support to me and this helped me in one way or other to reach the end of this thesis work.

At last, but not least, I would like to thank Addis Ababa Regional Health Bureau and respective health offices at sub cities for their support and facilitation; all senior providers who serve as data collectors; study participants (providers, head of facilities and clients) in Addis Ababa Public Health Centers, without their kind support it would have been impossible to accomplish the study.