



**QUALITY OF IMMEDIATE NEWBORN CARE AT JIMMA UNIVERSITY  
MEDICAL CENTER, JIMMA ZONE SOUTHWEST ETHIOPIA**

**By: Birtukan Edilu Tufa**

**A research paper submitted to Jimma University, Faculty of Public Health, Department of Population and Family Health in Partial Fulfillment of the Requirements for Degree of Masters of Public Health in Reproductive Health (MPH/RH)**

**November, 2018**

**Jimma, Ethiopia**

**JIMMA UNIVERSITY**  
**INSTITUTE OF HEALTH**  
**FACULTY OF PUBLIC HEALTH**  
**DEPARTMENT OF POPULATION AND FAMILY HEALTH**

**QUALITY OF IMMEDIATE NEWBORN CARE AT JIMMA UNIVERSITY  
MEDICAL CENTER, JIMMA, NOVEMBER, 2018**

**By: Birtukan Edilu Tufa**

Advisors: Dr. Mulumebet Abera (Main Advisor)

Mrs. Misra Abdulahi (Co-advisor)

November, 2018

Jimma Ethiopia

## **ABSTRACT**

**Background:** *Immediate newborn period is a period with great vulnerability that deserves inordinate attention. Quality of care at this critical period is a global priority due to the fact that quality health care provision at the time of birth is a cost effective intervention to decrease neonatal mortality, which is very high in developing countries particularly in Sub Saharan Africa. However little is known about the overall quality of immediate newborn care provided in the health facilities found in Sub Saharan Africa, particularly in Ethiopia while no study addressed users' perspective on the area.*

**Objective:** *To assess quality of immediate newborn care in University Medical Center.*

**Methods:** *An institution based cross-sectional study design using quantitative method supplemented with qualitative data was conducted in JUMC from March 1 - 30, 2018. The sample size for quantitative study was 384 mothers who gave birth in the hospital, 99 health care providers working in obstetric unit, 14 practice observations and 14 In-depth interviews were conducted for qualitative study.*

*Quantitative data was entered into Epi-data version 4.0.2.101 and exported to SPSS version 23, for analysis. Principal component analysis was used to assess quality of INC (Immediate newborn Care) and descriptive analysis was conducted. Binary and multiple logistic regression analysis was done to identify factors associated with maternal satisfaction on INC provided and Statistical significance was declared at  $p$ - value  $< 0.05$ . Adjusted odds ratios were used to see the strength of association with 95% CI. Qualitative data was analyzed thematically by manually. Quantitative data results were triangulated with qualitative.*

**Result:** *The overall quality of INC provided in the hospital was 61.9%. Accordingly, 55.6% good care provision setup, 65.7% good knowledge and practice self-report and 73.7% of maternal satisfaction are reported on INC provided at the institution. Moreover, one-fourth (25%) of the health care providers reported availability of medical supplies, and few (19.2%) received Essential newborn care training. Health care knowledge and practice reports are also less than international standard requirement, and missed INC components reported by qualitative finding. Furthermore, the overall maternal satisfaction was about 73%. Hence, two of maternal attributes shows strong association with their satisfaction; mothers who reported the infrastructure as good were 3.6 times more likely to be satisfied compared to those who reported as poor with  $p$ -value of 0.01(AOR=3.596, 95% CI= (1.36, 9.54)), and those mothers who rated the quality of INC provided in the hospital as good were nearly five times more likely to be satisfied when compared to those who rated as poor with  $p$ - value of  $<0.001$  (AOR= 4.95, 95% CI= (2.91, 8.43)).*

**Conclusion and recommendation:** *the overall quality of INC was poor, and maternal satisfaction status on INC provided was also less-than WHO recommendation. The hospital infrastructure and INC rated by mothers had strong association with maternal satisfaction. More attention should also be given to the overall INC quality and its sub-components that helps to increases chance of neonatal survival and maternal satisfaction.*

**Key words:** *newborn care, quality, maternal satisfaction*

## **ACKNOWLEDGEMENT**

First of all I would like to thank the Heavenly God my father. Next, I want to thank Jimma University, Institute of Graduate Studies, College of Health Sciences, Department of Population Health and Family Health for running this program and approving my MPH thesis on the topic.

I would also like to forward my deepest appreciation and thanks to my advisors Dr. Muluemebet Abera and Mrs. Misra Abdulahi for their unreserved help and advice and constructive comments starting from the development of the proposal until finalizing the paper.

Next, I would like to thank my study participants for their willingness to provide information on the area.

At last, but not the least, I would like to forward my heartfelt thanks to my family (My lovely husband Dr. Adula Bekele and my four children /4Ks) for their indulgent support and tolerance while I did the thesis.

# TABLE OF CONTENTS

<b>ABSTRACT</b>	<b>2</b>
<b>ACKNOWLEDGEMENT</b>	<b>3</b>
<b>TABLE OF CONTENTS</b>	<b>4</b>
<b>LIST OF TABLES AND FIGURES</b>	<b>5</b>
<b>ACRONYMS AND ABBREVIATIONS</b>	<b>6</b>
<b>CHAPTER ONE</b>	<b>7</b>
1.1. Introduction	7
1.2. Statement of the Problem	9
<b>CHAPTER TWO: LITERATURE REVIEW</b>	<b>1 1</b>
<b>CONCEPTUAL FRAME WORK</b>	<b>1 4</b>
<b>SIGNIFICANCE OF THE STUDY</b>	<b>1 5</b>
<b>CHAPTER THREE: OBJECTIVES</b>	<b>1 6</b>
3.1. General Objective	1 6
3.2. Specific Objectives	1 6
<b>CHAPTER FOUR: METHODS AND MATERIALS</b>	<b>1 7</b>
4.1. Study Area and Period	1 7
4.2. Study Design	1 7
4.3. Population	1 7
4.4. Eligibility criteria	1 8
4.5. Sample Size and Sampling Technique /Sampling Procedures	1 8
4.6. Study Variables	1 9
4.7. Data Collection tool and Procedures	1 9
4.8. Operational Definitions	2 1
4.9. Data Analysis Procedures	2 1
4.10. Data quality control	2 2
4.11. Ethical Consideration	2 3
4.12. Dissemination plan	2 3
<b>CHAPTER FIVE: RESULT</b>	<b>2 4</b>
5.1 Sample characteristics of Mothers and Health care providers	2 4
5.2. INC quality measurement dimensions/ indices	2 7
5.3. Overall quality of INC provided in the hospital	3 5
<b>CHAPTER SIX: DISCUSSION</b>	<b>3 8</b>
<b>STRENGTH AND LIMITATION OF THE STUDY</b>	<b>4 2</b>
<b>CONCLUSION</b>	<b>4 3</b>
<b>RECOMMENDATIONS</b>	<b>4 4</b>
<b>REFERENCES</b>	<b>4 4</b>
<b>APPENDICES</b>	<b>4 7</b>

## LIST OF TABLES AND FIGURES

### TABLES

Table 1: Background characteristics of the mothers who gave birth at JUMC March, 2018. ....	2	5
Table 2: The socio-demographic and economic status of Health care providers at JUMC, March, 2018..	2	6
Table 3: Knowledge and practices self-report assessment on process dimension at JUMC, March, 2018.	3	1
Table 4: Practice Observation finding report to assess quality of INC at JUMC, March, 2018. (N=14)	3	3
Table 5: Proportion of maternal satisfaction on INC areas, JUMC, 2018 .....	3	4
Table 6: The overall quality of immediate newborn care provided in JUMC, November, 2018.....	3	6
Table 7: Factors associated with maternal satisfaction on INC, JUMC, 2018.....	3	7

### FIGURES

Figure 1: Model to Assess Quality of Immediate Newborn Care in JUMC, Jimma, 2018.....	1	4
Figure 2: Practice environment situation reported by health care providers at JUMC, March, 2018 (N=99) .....	2	7
Figure 3: Human resource and capacity building report to assess quality of INC in JUMC, March, 2018	2	8
Figure 4: Availability of medications and other supplies to assess quality of INC at JUMC, March, 2018 .....	3	0
Figure 5: Availability of continuous water supply in the unit to assess quality of INC at JUMC, March, 2018 .....	3	1

## **ACRONYMS AND ABBREVIATIONS**

**ANC** = Ante Natal Care

**BF** = Breast feeding

**CSA** = Central Statistical Agency

**C/S** = Caesarean Section

**EENC** = Early Essential Newborn Care

**ENAP** = Every Newborn Action Plan

**ENC** = Essential Newborn Care

**INC** = Immediate newborn care

**JUMC** = Jimma University Medical center

**LBW** = Low Birth Weight

**MCH** = Maternal Child Health

**NICU** = Neonates Intensive care Unit

**OR** = Operation Room

**PFSA** = Pharmaceutical funding and supply agency

**PNC** = Post Natal Care

**SPSS** = Statistical Package for Social Sciences

**UNICEF** = United Nations Children's Fund

**USAID** = United States Agency for International Development

**WHO** = World Health Organization

# CHAPTER ONE

## 1.1. Introduction

According to WHO definition, neonatal period is a period within 28 days of life after birth (1). And, immediate new born care is defined as a care given to neonates by skilled personnel immediately after birth that include immediate drying and skin-to-skin contact to keep the newborn warm, hygienic cord care, giving appropriate stimulation for newborns unable to breathe, providing additional neonatal resuscitation measures as necessary, preterm or Low birth weight (LBW) care, early initiation of exclusive breast feeding, eye care, ensuring infection prevention and vaccination (1,2). Globally about 2.7 million neonates die in the first month of life each year, and from this 1 million die on their first day of birth. Most neonatal deaths occur in low and middle-income countries. From this, developing countries accounts for more than 98% (3). Particularly Sub-Saharan African countries carries the highest risk share and shows the least progress in reducing neonatal mortality (4).

Whereas, the first few hours after birth have a major influence on the future health and well-being of a newly born infant (5). This implies that initial adaptation is crucial to the baby's subsequent well-being that should be understood and facilitated by the health care providers at the time of birth.

Hence, WHO and UNICEF developed an action plan emphasized on creating an enabling environment for the practice of Early Essential Newborn Care (EENC) to improve quality of care and reduce the mortality burden as 80% of them are preventable using cost-effective interventions(5). Thus, provision of quality care to neonates is global focus and several attempts have been made by WHO and other responsible bodies through developing guide lines and provision of training, designing policies and strategies as an example. But there are very few studies conducted to assess the quality of care provided in Africa particularly in Ethiopia(1,6). Moreover, majority of those studies focused on health service utilization though very few studies assessed quality of immediate new born care (1).

Coming to the locality, JUMC referral hospital is the only referral hospital providing comprehensive health services for about 15-20 million people in southwest Ethiopia. Hence,



pregnant mothers were referred from every health facilities in the south west region for better and urgent management that demanded quality maternal and immediate newborn care to effectively manage complications as this helps to save life of many.

Furthermore, study conducted in Jimma zone revealed high infant mortality, and recommended quality improvement is compulsory in immediate newborn care, yet there is no study that assessed quality of immediate newborn care in the area (6,7). Furthermore, the university has made persistent efforts in extensive renovation and expansion work to make the hospital conducive for service, teaching and research while producing work force for the country. Therefore, assessing quality of immediate newborn care is vital to indicate skill gaps in the institution for improvement, and also to serve as baseline for further investigation.

## 1.2. Statement of the Problem

Deaths among children are more and more concentrated in the first days of life which makes focus on newborn care more critical than ever before (1). However considerable mortality reduction was observed globally during the last decade, developing countries still accounts for more than 98% of these deaths (8).

Consequently, neonatal mortality rate in low- and middle-income countries particularly Sub-Saharan Africa and South Asia is high which is 29 per 1000 live births (4). Moreover, as majority of the newborns in resource limited countries do not receive optimal care during the period, number of newborn deaths has shown inclination to even four times higher in Africa when compared to Europe. Whereas 80% of neonatal complications are preventable using cost-effective interventions (4) mainly through provision of immediate newborn care. This further helps to ensure a safe start to life and physiological adaptation to the immediate environment. Moreover, the life of 3 million babies and women could be saved by providing quality care around the time of birth as well (9). On the contrary, study findings from Tanzania, Pemba shown poor quality of care mentioning ill treatment by hospital staff and poor infection prevention system(10).

Therefore, Newborn Action Plan has been endorsed by the World Health Assembly and ratified by stakeholders and donors to reduce neonatal deaths to 10 per 1000 births by 2035 targeting to bring newborn mortality reduction by 38% (4). Similarly, 950,000 newborn deaths can be prevented each year if essential health services were provided (11).

However, Ethiopia is among countries with high neonatal, infant and under-5 mortality rates with 29, 48 and 67 deaths per 1,000 live births respectively according to EDHS 2016 report (12). Additionally, 17.89% of facilities faced the problem of skilled health professionals and lack of training (13), and 51% of births in sub-Saharan Africa and 72% of births in Ethiopia were not attended by skilled health care providers which further diminishes quality of care while increase risk of deaths (13). However, research findings in Jimma zone reported a neonatal mortality rate of 35.5% which is even higher than the average sub-Saharan countries mortality rate. The study also recommended immediate neonatal care quality improvement as an strategy of mortality reduction (6) whereas, there is no study conducted in the area aiming at quality of immediate

newborn care at institutional level which can basically hinders strive for achievement of the targeted goal. Besides, quality of immediate newborn care should get a concern when prompt action and improvement has been desired. Therefore, studies regarding quality of immediate newborn care are very critical as evidence for the current quality care status measurement, and also to dig the reason behind. On top of that, the finding will serve as a base line for further investigation and quality improvement interventions.

## CHAPTER TWO: LITERATURE REVIEW

Immediate newborn care is a care provided around time of birth which could avert more than 40% of global neonatal mortality (14). The quality of care provided at this time can highly impact the health of newborns which deserve an immense attention to ensure their survival. Accordingly, it is paramount important to know the quality of care provided at this critical life time. However, quality of care is measured using different models. According to Donabedian quality care is defined as “a care which is expected to maximize an inclusive measure of client welfare, after one has taken account of the balance of expected gains and losses that attend the process of care” with the following three distinct factors or dimensions (structure, process and outcome).The three specified are helpful to draw information in assessing quality of health care provided which is tried to be applied in this research.

**1. Structure:** according to the model, structure refers to the settings in which care is provided, including hospital buildings, staff adequacy, enabling practice environment and availability of supplies (medications, medical equipment or materials and other supplies). Globally Fifty two percent of neonatal death are due to lack of appropriate care, yet there was a plan emphasized on creation of an enabling environment for the practice of EENC (Earl essential newborn care) that can prevent about 50 000 newborn deaths annually (14). In the same way, in South Asia and sub-Saharan Africa about 25% of all neonatal deaths are due to infections which necessitates availability of life saving medications or antibiotics in the in health facility at any time (15). Thus, availability of basic supplies facilitates provision of timely and quality health care services. However, lack of basic medical supplies are the main reason that compromised quality and it accounts for about 58.54% while 20% health facilities required women to buy supplies for maternal and child health services to provide health care (13). Similarly, study findings from Tanzania justified seldom utilization of sterile glove and hand washing practice before care provision to the newborns (10). The study conducted in Sudan, Khartoum shown 93% ENC training coverage (16). Additionally, 17.89% of facilities faced the problem of skilled health professionals and lack of training in Ethiopia (21), and less than half (46%) of the health care providers get training in newborn care within the past two years while 70.9% of health care providers were getting access to newborn care national guideline (17).

**2. Processes:** process designates the transactions between patients and providers throughout the delivery of health care which can comprises knowledge and practice of health care providers. A qualitative Study conducted in Tanzania showed knowledge gap on the way of keeping instruments sterile (10), and 56.6% of them had poor knowledge in Sudan. (16).According to study conducted in North Ethiopia, Bahir Dar city, revealed that about 56% of respondents had good knowledge on INC (18). Another study also confirmed that health care provider skills and competencies within health facilities are insufficient to increase neonatal survival (13). Thus, study conducted in Sudan Khartoum indicated 41.1% and in Tigray 52.4% immediate newborn care practice (17). Thus, the health care providers' overall INC (immediate newborn care) knowledge report was 69% in 11 Sub-Saharan African countries, 78% in India, 68% in Uganda, 55% in Ethiopia and 75% in Tigray respectively (17,19–22) though there was variation between knowledge and practice or skill observation (20,22).

Additionally, the study findings of each INC components exposed differences among countries, as 62% and 79% of care provider have knowledge to clamp or tie the cord after pulsation stops in sub-Saharan Africa and in Ethiopia respectively (18,22) whereas, 90.8% use sterile glove while 74.6% washed their hands before newborn care provision in Bahir Dar (18). About 80%, 95% and 94% of newborns were also immediately dried with towel after birth while 65%, 96% and 54.9% of the care providers discarded wet towel to replace with the dry one in sub-Sahara, Tanzania and in Bahir Dar respectively (1,18,23). The report of keeping newborns in skin-to-skin contact was also 45% in Sub-Saharan Africa and, 74.6% and 86.4% in Ethiopia (1,17,18). Regarding early initiation of breast feeding, 85.8% started breast feeding within one hour of birth while 59.4% mothers taught about good attachment of breast feeding (18). Moreover, the research findings from India revealed that 76% of care providers were knowledgeable about how to manage birth asphyxia (20). Besides, TTC eye ointment application practice was 73% in Tigray while 94.8% in Bahir Dar (17,18). Concerning preterm birth, findings shown that 83% and 86% care providers had knowledge to determine gestation or low birth weight(18,24). The study findings of Vitamin K injection knowledge report was 100 % in Philippines, 66.2% in Tigray and 85.8% in Bahir Dar (17,18,25) while there is variation between knowledge and practice as 76% good knowledge while 55% good practice (20). Research findings of care provides' knowledge in infection

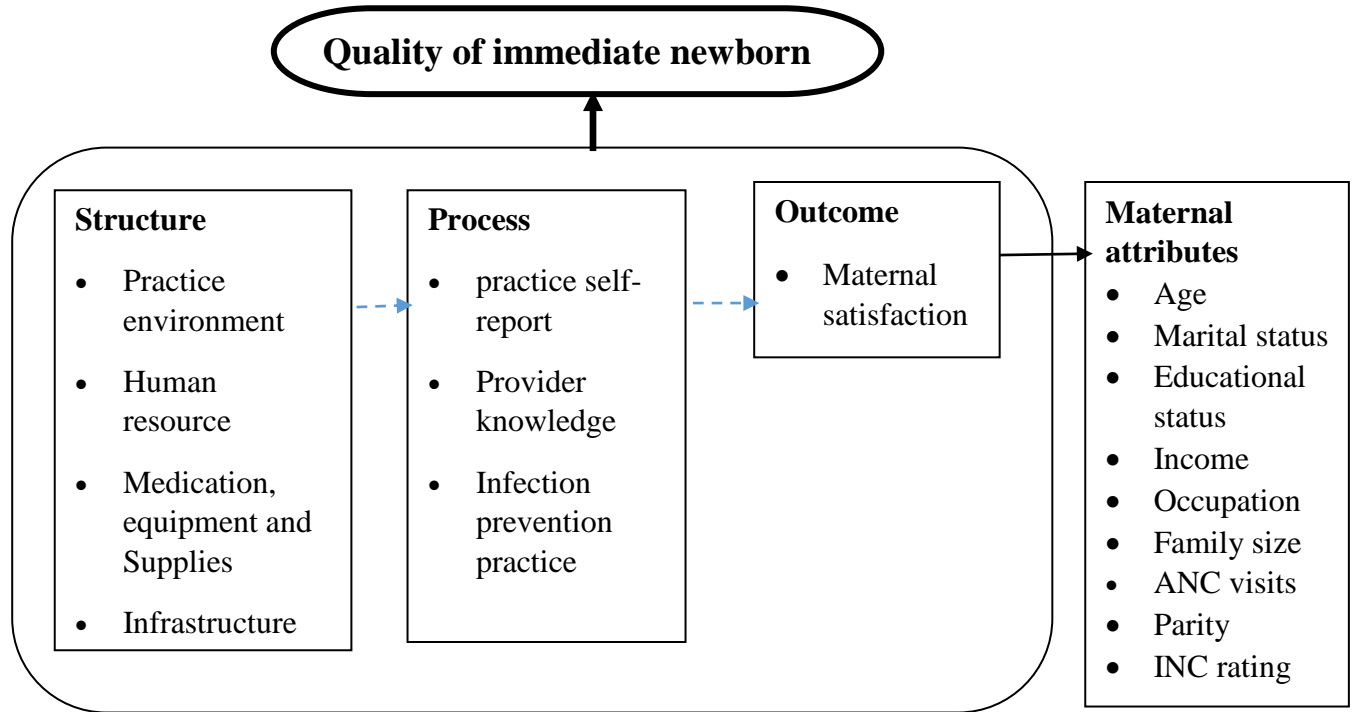
detection and management was also <50%, 59%, and 76.1% in Vietnam, Tanzania and Ethiopia respectively (18,23,24) where 70% of newborn received Hepatitis B vaccine before discharge (25).

- 3. Outcome:** refers to the effects of health care on the health status of patients which can be measured or indicated by length of stay in the hospital and their health status and satisfaction. It is fact that quality of care provided impacts client satisfaction which indirectly helps to assess the quality of health services. The study finding from Serbia shows that 74.6% of mothers were satisfied on newborn care and interpersonal communication while the lowest satisfaction rate of all aspects was environmental factors as only 54.7% mothers were satisfied about the hospital environment convenience and cleanliness (26). Conversely, about 63.7% mothers were satisfied with the overall hospital infrastructure in Ruwanda (27). Other studies done in Ethiopia also revealed that 60% of mothers were satisfied on advice for breast feeding and vaccination in Gojam referral Hospital. Whereas, the overall maternal satisfaction on INC was 80% in Amahara region hospitals and 88.7% in Debre Markos (28–30).

In general, immediate newborn intervention skill can prevent neonatal deaths and disabilities in early life (31). Thus, WHO suggested that facilities must have sufficient medicines, supplies, equipment and trained health care providers to provide adequate care (2). There is also great variability in immediate newborn care quality and associated factors in different settings and area (1,17,18,22). The findings of this study may be different that require specific intervention to the health facility based on the findings as standardized evaluation system and instant action is also a key to address the reality. Besides, very few studies have been conducted to assess quality of newborn care provided in health institutions in Ethiopia. Coming to the study area, Jimma, there is no similar study that assesses health institutions quality of care. Therefore, this study has a contribution in improving quality of immediate newborn care in the hospital as it will be able to identify gaps and health facility readiness in provision of immediate newborn care. It will also help to detect the reason behind poor immediate newborn care in the setup, and serve as a baseline data for further studies and intervention actions.

## CONCEPTUAL FRAME WORK

The conceptual framework was developed based on Donabedian model of structure, process, and outcome framework (25). The box indicates the dimensions of weighted quality measures of immediate new born care.



**Sources:** The model was adapted from Donabedian quality of health care assessment model, WHO Essential Newborn Care guide line and other similar literatures (1,30,32).

*Figure 1: Model to Assess Quality of Immediate Newborn Care in JUMC, Jimma, 2018.*

## **SIGNIFICANCE OF THE STUDY**

Despite the fact that provision of quality newborn care immediately after birth increases their chance of survival and health of subsequent life time, it is the most neglected time for the provision of quality services. Lack of appropriate care during this period could also results in significant ill health and even death while equipping health care providers with the correct knowledge, technical skills and enabling infrastructure can allow them to carry out essential newborn care practices that can reduce neonatal mortality by half. Moreover, studies conducted in the area were very scarce particularly in sub Saharan Africa where resource limitation and poor infrastructure is highly observed. Moreover, majority of the studies done were focused on the general neonatal care practice and determinants that pave the way to improve health service utilization. However, very few studies assessed quality of care provided in health institutions while death rate in the neonatal period is concentrated in the first day of life. In addition, studies undertaken in the area didn't address service users' perspective which is important to improve health service quality and service utilization.

Thus, the findings of this study will be paramount important for the institution to design quality improvement schemes, for health care provider to use as an input to improve their daily practices in the provision immediate newborn care, and for clients to get safe newborn care at the facility. It may also contribute empirical evidences to the body of literature in the field of newborn care. Furthermore, the study result will provide additional information for further investigation in the area.



## **CHAPTER THREE: OBJECTIVES**

### **3.1. General Objective**

- ✚ To assess quality of immediate newborn care in JUMC from March, 2018.

### **3.2. Specific Objectives**

- ✚ To assess infrastructural status of the hospital for immediate new born care (INC) provision in JUMC
- ✚ To assess health care providers' competence for INC provision in JUMC
- ✚ To assess maternal satisfaction status on INC provided in JUMC
- ✚ To identify factors associated with maternal satisfaction in JUMC

## **CHAPTER FOUR: METHODS AND MATERIALS**

### **4.1. Study Area and Period**

The study was conducted at Jimma University medical center (JUMC) which is one of the public hospital found in Jimma zone, south west Ethiopia. This Hospital is a tertiary hospital in Jimma town which is 357 km far away from Addis Ababa the capital city of Ethiopia. It provides health services for 15-20 million people in Southwest of the country. JUMC contain four major wards (Obstetrics and gynecology ward, pediatrics ward, surgical ward and medical ward) with outpatient department for each. In Obstetrics and gynecology department, maternal health services such as antenatal care service, delivery service and post natal care are being provided that has the highest patient flow. In 2017, 5973 deliveries were conducted, and total number of live births was 3,976, among which 3,504 were live term births and 472 were live preterm births(6,7). Regarding maternal and newborn facilities, 60 beds in gynecology ward, 52 beds in maternity ward; 9 first stage bed, 8 postnatal bed and 8 delivery coach in labor ward, 1 recovery room and 2 OR tables in maternity OR, 2 admission room for neonatal admission and 8 rooms for mothers in NICU were found. The study was conducted from March 1- 30, 2018.

### **4.2. Study Design**

Facility based cross-sectional study was conducted in JUMC obstetric/ maternity unit for quantitative and descriptive phenomenological study design for qualitative study.

### **4.3. Population**

#### **Source population:**

**For quantitative study:** all health care providers working in JUMC and all mothers who gave birth in JUMC.

**For qualitative study:** all health care providers working in labor ward for practice observation and all health and administrative staffs working in relation with obstetric care.

#### **Study population:**

**For quantitative study:** all mothers who gave birth in JUMC during period of data collection, all health care providers working in obstetric unit.

**For qualitative study:** 14 health professionals and administrative bodies interviewed, and 14 healthcare providers were observed while providing immediate newborn care in the labor ward during the study period.

#### **4.4. Inclusion and exclusion criteria**

**Inclusion criteria:** all mothers who gave birth to live baby with SVD and instrumental assisted deliveries; all administrative bodies working in the maternity service area and all health professionals (Nurses, Midwives, Residents and Gynecologists) who provide INC in the unit.

**Exclusion criteria:** mothers who were severely ill and unable to respond to the interview were excluded from the study.

#### **4.5. Sample Size and Sampling Technique / Procedures**

##### **4.5.1 Sample size determination**

##### **Quantitative data:**

Sample size for mothers was determined using single population proportion formula. As there was no institution based study on mothers regarding immediate newborn care, 50% is used to generate larger sample size.

##### **Single population proportion calculation formula:**

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

- **Where:** -n= minimum sample size required for the study
  - Z= standard normal distribution (Z=1.96) with confidence interval of 95%
  - P= proportion of the overall status of neonatal care practice, 50% because there is no similar study.
  - d= is a tolerable margin of error (d=0.05)

**Therefore, the calculated sample size with the formula will be 384.**

**Sample size determination for health care providers:** the sample size for health care providers wasn't calculated as their total number (including Senior Obstetrician and gynecologists,

Residents, Neonatology nurses, midwives, nurses and MSC in maternity nursing) were **130**, but those who will not be willing to participate in the study were taken as non-respondent.

### **Qualitative study:**

A total of 20 newborn care practices was observed. A total of 14 qualitative informants (two senior obstetricians, nursing service director, vice nursing service director working on the maternity side one, supply-chain directors, quality officers, pharmacy unit head, Maternity operation theater head nurse, neonatal intensive care unit head, labor ward head midwife, maternity ward head nurse, and two midwives) were participated in the study.

#### **4.5.2. Sampling technique**

All mothers who fulfill inclusion and exclusion criteria were approached at the time of discharge for interview and all health care providers who were available during the study period were approached through head nurses and head midwives in each unit to fill the questionnaire. All qualitative informants were purposely selected.

### **4.6. Study Variables**

#### **4.6.1. Independent Variables**

- ✚ **Background characteristics of mothers and/ or Health care professionals:** Age, Sex, Ethnicity, Marital status, Religion, Educational status, Income, Work experience, ANC follow-up, Parity and Family size, INC quality rated by mothers
- ✚ **Structure:** Practice environment; Human resource; Medication, equipment and Supplies; and Infrastructure.
- ✚ **Process:** health care providers' practice self-report, knowledge and Infection prevention practice.
- ✚ **Outcome:** Maternal satisfaction

#### **4.6.2. Dependent Variable**

- ✚ Quality of immediate newborn care

### **4.7. Data Collection tool and Procedures**

#### **4.7.1. Data collection tools**

**For quantitative:**

Data collection tool was adapted from different relevant literatures (1,17,18,23,34). The tool for assessing quality consists of 59 items categorized under three major dimensions: structure, process and outcome. The structure items have four subscales: Practice environment (4 items), Human resource (2 items), Medication, equipment and Supplies (3 items), water supply (1 item), the process items have three sub scales: practice self-report (18 items), Provider knowledge (17 items), and Infection prevention practice (2 items), and the outcome scale consist of seven common satisfaction items. Information on structure and process were collected from health care provider whereas outcome information were collected from the mothers. Quantitative data collection tool was organized under three parts. (Part I is about background characteristics of respondents, part II is about knowledge and practice self-report of health care providers or maternal satisfaction on INC provided, and Part III is about infrastructure of the hospital. Qualitative data were collected using an interview guides developed by the research team and validated checklist was used for observation (1,18).

#### **4.7.2 Data collection procedure**

Data was collected through face to face interview from mothers, self-administered questionnaire from health care provider, participatory practice observation, and in-depth interview. Data collectors were four trained midwife professionals recruited from other health care institution. **In-depth interview** was made by two mid-wives form Agaro Hospital who has experience of data collection to conduct interview with purposively selected administrative bodies and health professionals to get rich information. Field notes were taken and all interviews were audio-recorded after verbal consent was obtained from study participants. Observation of normal and complicated births was made by experienced midwives in the first 2 hours after birth to evaluate the quality of immediate newborn care and supplies.

## 4.8. Operational Definitions

**Immediate newborn care:** is a care given to the neonates following birth within two hours in the delivery room by skilled health professionals (Midwives, nurses, and physicians). It includes cord care, thermal protection care, resuscitation care, protection from infections, preterm/ LBW baby care, initiation of breast feeding, infection management care by early assessment of neonatal condition and continuation of further care as per protocol (1,17,18).

### **Measurements:**

**Quality of immediate newborn care:** refers to the sum of weighted indices of structure, process, and outcome items. If the score is  $\geq 80\%$ , it was considered as good quality of INC otherwise poor. Weighted indices were calculated by multiplying the relative weight assigned to each sub scales with the participant scores on each sub scales and dividing by 100. Relative weight assigned to each sub scale was computed by dividing the number of items in each sub scale for the total items and multiplying by 100. Weight for each dimension (structure, process, and outcome) determined by adding relative weight assigned to each sub scale.

**Structure:** refers to the conditions under which care is provided which include: Practice environment, Human resource, Medication, equipment and Supplies, and Infrastructure. It was considered as good when the overall responses for each area scores are  $\geq 80\%$ .

**Process:** refers to the interaction between care giver and client (recipient). According to this study includes the three subscales (Health care providers' knowledge, Practice self-report, and infection prevention practices. It was considered as good when the overall responses for each area scores are  $\geq 80\%$ .

**Outcome:** according to this study outcome includes maternal satisfaction scale which consists of 9 satisfaction items. It is considered as good when the overall satisfaction score is  $\geq 80\%$ .

## 4.9. Data Analysis Procedures

### **Quantitative data:**

Data was cleaned, coded, and entered to Epi-data version 4.0.2.101 and exported to SPSS version 23 for analysis. Principal component analysis (PCA) with varimax rotation methods was done to reduce the structure and process items. After PCA, the structure and process items were

reduced to 47 items under seven major themes. Items under each theme were added using compute variables after transforming the negative questions. Then each of them was recorded as 1= good and 0=poor using mean as cut points. Then the percentage was computed using descriptive analysis. In addition descriptive summaries of socio-demographic variables were done for the two data materials from mother and health care providers. Finally the results were presented using tables, graphs and narratives.

#### **Qualitative data:**

The qualitative data was transcribed, coded and categorized under three themes manually and triangulated with the major quality dimensions of INC. Narrative description of the findings from the observation was done. Finally the level of quality was judged based on preset criteria above and results from qualitative data.

### **4.10. Data quality control**

The questionnaires were prepared in English and common understanding was reached upon them by all data collectors before data collection. In addition, questionnaire used for mothers were translated to the local language Afan Oromo and back translated to English to ensure consistency. Standardized tool was used and experts on the area were consulted to ensure validity of the tools. Collected data was also checked for completeness by principal investigator every day after data collection. Epi-data was used for quantitative data entry to minimize errors, and transported to SPSS version 23, then coded and cleaned before analysis. The interview guide and checklists were developed from WHO guidelines in combination with Donabidean quality care measurement model and quality of newborn assessment related literatures.

#### **4.10.1 Data collectors and supervisors**

Four experienced BSc midwives were recruited for quantitative data collection and another two midwives who have an experience of qualitative data collection were recruited for qualitative data collection. All recruited data collectors were trained for two days before data collection. Discussion was made on tools for clarification, supervision strategies, ethical issues, and also demonstration of how to fill or collect the data has been made on training. The Principal investigator supervised the overall data collection process at all stages.

#### **4.10.2 Pretest**

The tools were pretested at Shenen Gibe Hospital maternity unit on 10 (ten) health professionals and 42 mothers to detect misunderstandings, ambiguities, or other difficulties participants may encounter with instrument items. Correction or modification was made based on the feedback obtained from pretest. Cronbach alpha test was also done to check reliability of the tools, and was 0.76.

#### **4.11. Ethical Consideration**

Ethical clearance was obtained from Jimma University Ethical review board (ERB). Official letter was taken from department of Population and Family Health to JUMC medical director and Maternity unit head. Then Verbal consent was obtained from each study participant after explaining study objective before data collection. Study participants' autonomy was respected and they were assured that the data they provide will be kept confidential by not mentioning name of participants rather code has been given to each participants for identification. Each department head was communicated before the start of observational study and the data was collected for long time to minimize bias. The collected data was not accessed by other person and kept separately in locked cabinet.

#### **4.12. Dissemination plan**

Based on the findings of the study, summary reports and policy briefs will be communicated to all concerned bodies including examiners, invited guests, JUMC Medical director and staffs working in maternity unit. The written documents will be submitted to JU CBE office, Maternity unit administrative body, Jimma zone Health office and concerned NGOs. Presentation of the main findings will be done on National and International conferences. Publication on reputable journals will also be attempted/ made.



## **CHAPTER FIVE: RESULT**

### **5.1 Sample characteristics of Mothers and Health care providers**

#### **5.1.1 Background characteristics of Mothers**

From the total of 384 mothers participated in the study with the response rate of 100%, more than one-third 135 (35.2%) were in the age group of 25-29 years, 260 (67.7%) were Oromo by ethnicity, 290 (57%) were Muslim by religion. More than three-fourth (76.5%) of the study participants also attended primary school and above, 167 (43.5%) were housewives by occupation, 260 (67.7%) of them reside in urban area and 117 (30%) earns  $\geq$ 5000 ETB monthly.

Concerning family size, more than two-third (68%) of study participants had less than five family members, 168 (43.8%) mothers were primi-para who gave their first birth in the hospital and almost all (98.2%) of them had ANC follow up out of which 279 (72.7%) of them had four or more visits (Table 1).

Table 1: Background characteristics of the mothers who gave birth at JUMC March, 2018.

VARIABLES		FREQUENCY (%)
<b>Age</b>	<20	21 (5.5)
	20-24	123 (32.0)
	25-29	135 (35.2)
	30-34	66 (17.2)
	>34	39 (10.2)
<b>Ethnicity</b>	Oromo	260 (67.7)
	Amhara	52 (13.6)
	Yem	18 (4.7)
	Kafa	17 (4.4)
	Gurage	14 (3.6)
	*Others	23 (6.0)
<b>Religion</b>	Muslim	219 (57.0)
	Orthodox	111 (28.9)
	Protestant	54 (14.1)
<b>Marital status</b>	Married	361 (94.0)
	Unmarried	10 (2.6)
	**Others	13 (3.4)
<b>Educational status</b>	No formal education	90 (23.5)
	Primary school education	126 (32.8)
	Secondary school and above	167 (43.6)
<b>Occupation</b>	house wife	167 (43.5)
	Government and NGO employee	94 (24.5)
	Self-employee	49 (12.8)
	Farmer	19 (4.9)
	Unemployed	55 (14.3)
<b>Place of residence</b>	Urban	260 (67.7)
	Rural	124 (32.3)
<b>Monthly family income</b>	<1200	97 (25.3)
	1200-2999	99 (25.8)
	3000-4999	63 (16.4)
	>=5000	117 (31)
<b>Family size</b>	1-4	261 (68.0)
	5-8	110 (28.6)
	>8	13 (3.4)
<b>Parity</b>	1	168 (43.8)
	2-5	201 (52.3)
	>5	15 (3.9)
<b>ANC follow up</b>	Yes	377 (98.2)
	No	7 (1.8)
<b>Number of ANC visits</b>	<4 visit	98 (25.5)
	>=4 visits	279 (72.7)

Note: \*Other included Tigre, Dawuro, Wolayita, Hadiya &, \*\*Other represented separated, divorced, widowed

### 5.1.2 Background characteristics of Health care providers

Ninety nine (99) health care providers from the total of 130 in four units (Labor ward, Maternity ward, Maternity OR and NICU) participated in the study making the response rate of 76.2%. From this, 58(58.6%) of them were male, 61(61.6%) were found in the age group of 25-29 years, 37(37.4%) were followers of Orthodox Christianity by religion, 65(65.7%) were Oromo by ethnicity, 49(49.5%) were married , 54(54.5%) were BSC holders, 37(37.4%) had net monthly income in the range of 2, 384 to 3,104 ETB. More than half of them had work experience of 2-5 years while 57 (57.6%) stayed in the current unit for 7-24 months 50 (50.5%) (Table 2).

Table 2: The socio-demographic and economic status of Health care providers at JUMC, March, 2018.

VARIABLE	FREQUENCY (%)	
<b>Sex</b>	Male	58 (58.6)
	Female	41 (41.4)
<b>Age</b>	20-24	22 (22.2)
	25-29	61 (61.6)
	≥ 30	16 (16.1)
<b>Religion</b>	Orthodox	37 (37.4)
	Muslim	27 (27.3)
	Protestant	30 (30.3)
	*Other	5 (5.0)
<b>Ethnicity</b>	Oromo	65 (65.7)
	Amhara	26 (26.3)
	**Other	8 (8.1)
<b>Marital status</b>	Married	49 (49.5)
	Single	47 (47.5)
	Divorced	3 (3.0)
<b>Educational status</b>	Diploma	32 (32.3)
	BSC	54 (54.5)
	Gynecologist	13 (13.1)
<b>Monthly income in birr</b>	≤ 3104	38 (38.4)
	3105-3825	21 (21.2)
	3826-4546	9 (9.1)
	4547-5267	9 (9.1)
	>=5268	22 (22.2)
<b>Work experience in year</b>	<=1	18 (18.2)
	2-5	57 (57.6)
	6-10	21 (21.2)
	≥ 11	3 (3.0)
<b>Duration of stay in current unit</b>	<=6 months	17 (17.2)
	7-24 months	50 (50.5)
	≥ 25months	32 (32.4)

Note: \*Other included Catholic, Wakefata, Adventist &, \*\*Other included Gurage, Hadiya, Kefa

## 5.2. INC quality measurement dimensions/ indices

The study findings assessed quality of INC at JUMC from the three dimensions including structure, process, and outcome. Thus, the overall quality of INC care in these aspects will be presented in this section one after the other. (See Appendix five for the details)

### 5.2.1 Structure Dimension

The structure dimension of INC was assessed from the perspectives of practice environment, human resource and capacity building, availability of medications, availability of medical instruments and other supplies, and continuous water supply.

#### Practice Environment attributes of quality INC

Concerning the practice environment of the hospital, more than two-third (69.7%) of the health care providers responded that the hospital has adequate space to provide INC, 63 (63.6%) of them perceived that the physical environment is clean and comfortable, 49(49.5%) reported that INC guideline is available in the unit while only 24 (24.2%) reported presence of staff reinforcement mechanism (Figure 2).

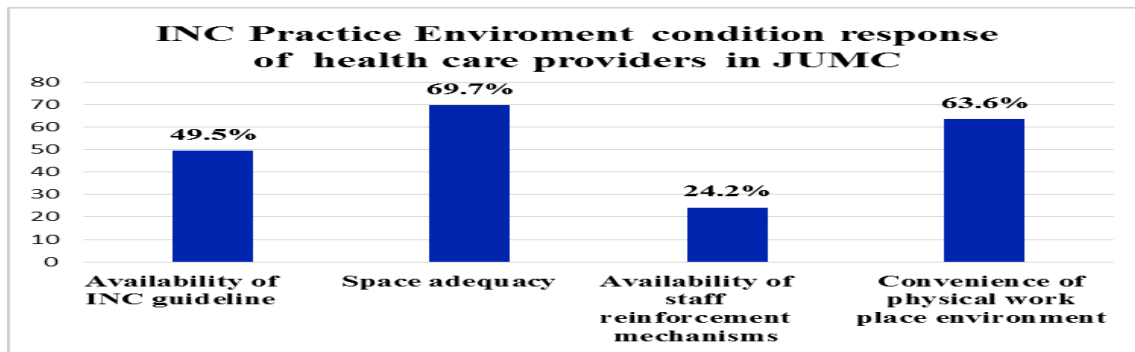


Figure 2: Practice environment situation reported by health care providers at JUMC, March, 2018 (N=99)

In-depth interview finding also supported these findings as many of them said that there is lack of system in the hospital that can reward those who are performing better and punish those who failed to carry out their responsibilities. For example, a senior staff who had 8 years of work experience narrates his experience as follow:

*“...there is no system to motivate staffs in the hospital. Hence, good and poor performers are being treated equally; now there is high tendency of inclining to poor performance. For example, if I take a wrong measure and if nobody is there to question me why I did so, if no one is there to*

*oversee my activities I may not care and I may do only what I want to do disregarding the required standard of practices...*”

Another staff from Quality office added:

*“...Last time when we audited maternity area, almost more than half of the staffs responded that they were ready to leave. There is high turnover. Many of their problems are interlinked and the main reason they have raised were problem of incentive, work environment inconvenience and lack of good management. Though subdivision or structures are just set up to lower level or team level, it is not functioning well...”*

Moreover, most (12) of in-depth interview participants stated that hard copy of ENC guideline was not available in the units. For instance, one of the senior staff who was 35 years old said:

*“...we have a protocol adapted from different guide lines that was prepared before five years. We put it on first stage area in labor unit twice at some time but it stayed there only for two days, we don't know who took it. Even though all Residents (R1-R4) have the soft copy now, there is no hard copy available to be used/ referred...”*

### **Human resource related quality attributes of INC**

Regarding adequacy of staffs in the hospital to provide care to the newborns, 60 (60.6%) of the respondents perceived that there is adequate staffs to provide INC. However, very few (19.2%) of them received training on INC (Figure 3).

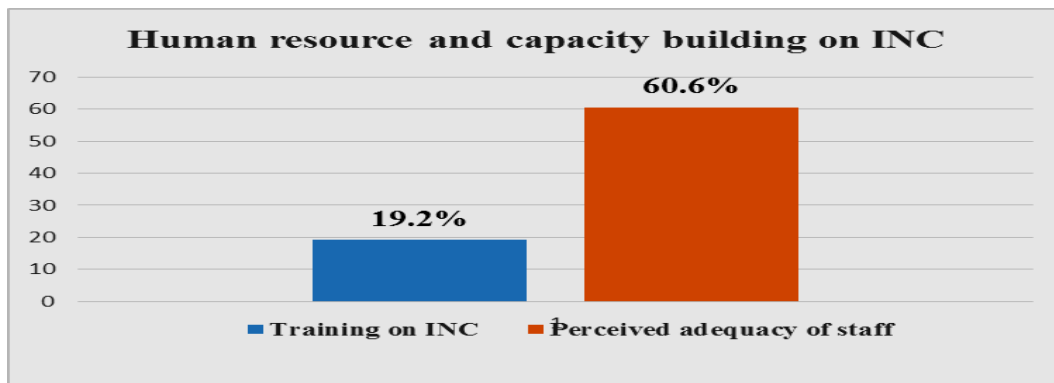


Figure 3: Human resource and capacity building report to assess quality of INC in JUMC, March, 2018

Similarly, participants who offered interviews also discussed seriously the limitation of in-service training on the area. For illustration, a BSC mid-wife who was 26 years old with two years' work experience stated lack of training as follows:

*“...I didn't see any training about newborn care within these two years, but may be those staffs who stayed longer in the unit might have received it before my arrival at the unit...”*

Participants of the study were also questioned fairness in the selection of trainees in the limited training opportunity offered by the hospital. The interview extract taken from the interview of BSc Nurse Informant who is 45 years old with 25 year work experience illustrates the case as follows:

*“... since there is no staff motivation system, we want to use this rare training opportunity as a mechanism to motivate well performing staffs, but administrative bodies didn't allow us to do so. When there is a training opportunity, they told us to send them lists of all staffs in the unit and then they select participants randomly. I see that the equal treatment of all staffs in this regard disregarding their performance de-motivate staff members.*

### **Medications, Medical equipment and other Supply availability related quality attributes**

Coming to availability of medical supplies, only one-fourth (25%) of the health care providers reported the availability of medical supplies like surgical gloves, catheter, newborn size I.V cannulas and laboratory test tubes etc. On the other hand, report about availability of newborn warming clothing was 54.5% whereas less than half (48.5%) availability of essential medications and antibiotics including Intra-venous fluids, TTC eye ointments and vitamin K injections (Figure 4).

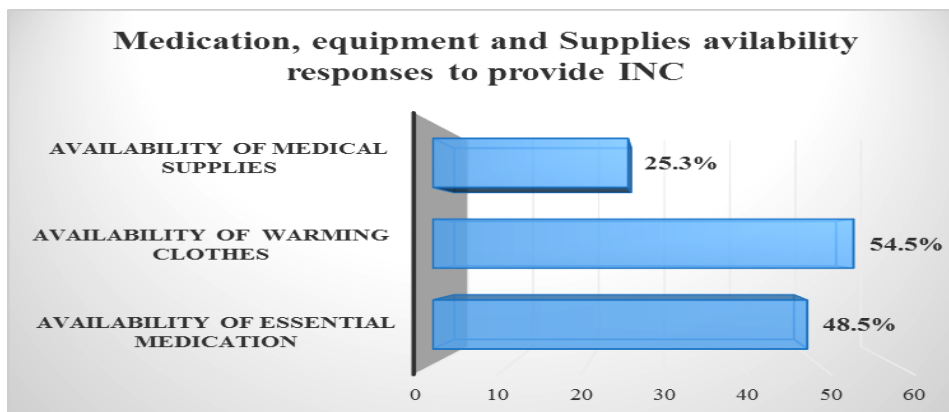


Figure 4: Availability of medications and other supplies to assess quality of INC at JUMC, March, 2018

The observation finding also revealed that only half (50%) of the newborns received vitamin K injection while almost all the mothers buy surgical gloves, test tubes, IV cannulas, vitamin K injections and TTC eye ointments as needed. However, those who couldn't afford didn't buy. Thus, few surgical gloves in the stock were used in such a case. The finding from key informants also confirmed the persistent existence of supply problem.

A 31 years old health professional who was MPH holder, and served for 7 years elaborated about supply shortage in the hospital as follows:

*“... Our main problem is supply shortage. Last year when we had meeting with MOH about supply issue, the report revealed that Jimma has got the lowest supply among all regions. But they didn't dig out the reason behind. May be the staffs working with PFSA do not request and process on time. They might be too late in receiving the supplies from PFSA. There might be internal requesting gap though it is not this much serious problem...”*

The same informant added:

*“... We have also a problem of utilization, the budget allocated for supply didn't consider the supply to be utilized by all clinical health students. It is requested only for the service and brought here for service; but as it is a teaching hospital, all those who wear white gown utilize it. This caused the finishing of supplies before the planned utilization time. This is also a great problem...”*

A 24 years old BSc mid-wife working in the unit said that:

*“...we give vitamin K and TTC eye ointment if available, if not we write prescription. We tell the attendants to buy but as they buy many things they are tired of it and didn't want. Due to this reason neonates missed the medications. For example there is no TTC eye ointment in the unit for the last two weeks...”*

### **Continuous water supply availability related quality attribute**

Regarding continuous water supply in the unit, the health care providers' report shows that less than half (45%) reported continuous water supply. There were two sinks observed in the labor ward second stage room (one is functioning) and there was continuous water supply, but there is

no detergent to be used during the whole observation period, and no one washed his/her hands before sterile glove is worn while providing INC (Figure 5).

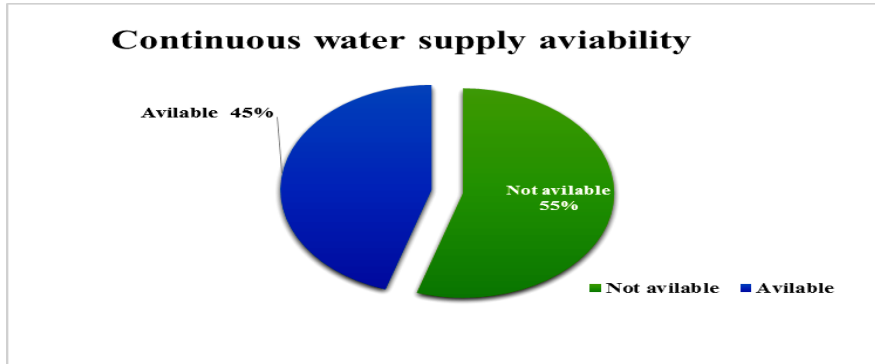


Figure 5: Availability of continuous water supply in the unit to assess quality of INC at JUMC, March, 2018

### 5.2.2 Process Dimension

Healthcare providers participated in the study responded to knowledge and practice questions of INC. The mean score was used as a cut point to be categorized as good and poor.

Accordingly, majority (85.3%) of them had good knowledge about preparation made before cord care. 71.5% of them had good knowledge about prevention of hypothermia care, 77 (77.8%) had good knowledge about EEBF care practice (Table 4).

Table 3: Knowledge and practices self-report assessment on process dimension at JUMC, March, 2018.

INC Attributes	INC Attributes	Frequency (%)
<b>Knowledge report</b>	Preparation made for Cord care	85 (85.3)
	Knowledge of hypothermia prevention methods	71 (71.5)
	Knowledge on early exclusive breast feeding	77 (77.8)
<b>Practice self-report</b>	Birth asphyxia practice-self report	69 (70)
	Eye care practice self-report	73 (73.1)
	Preterm/ LBW birth care practice self-response	74 (74.2)
	Medical procedure provision practice self-response	62 (62.5)
	Infection prevention practice self-report	45 (45.5)



Moreover, the qualitative data collected from care provider on this dimension was in contrary to the above findings. For instance, a 32 year MSc holder participated in the study described the knowledge and practice status of the health workers as follows:

*“...I don’t think there is knowledge and skill gap in this hospital as diversified professionals are found in the facility, if they are motivated professionals, they can easily learn from others who are specializing in the area...”*

Another senior physician added that the problem is not lack of knowledge and skills but leaving their duties and responsibilities to trainees, which is believed to affect the quality of care and life of newborn infants. For illustration:

*“...Quality issue is a new concept and it is a bit difficult for me to assess quality of their performance. But according to my observation, some do their responsibilities properly, other are not, they simply sit in the unit by leaving it to residents and interns. This should not be, I do not have to give my duties and responsibilities to others when someone (students) wants to do, it is me who should permit and I have to supervise them, and he/she should ask for my permission to do...”*

Moreover, a 32 year old quality officer with eight year work experiences asserted that his office has conducted quality assessment and noted that some units are doing to the required level while others are lagging behind in giving services to the expected level. For illustration:

*... As a quality officer when we assessed technical quality of INC provided in the unit using some indicators, in the last assessment there is a gap as some were done in a good way and others were not, full ENC components were not given to the newborns”.*

The same interviewer underscored that the limitation in INC is more attributed to lack of effective management of materials and human resources as some of the equipment are not functional and no effective system of monitoring if staffs are in duty or not.

*“... Quality of care provided in NICU is better even though there is shortage of some medical supplies. Some supplies are available but not functional; few others were not available at all. There is also lack of proper utilization of trained professionals, lack of system for supervising seniors’ involvement, hence, they don’t avail themselves as a full time staff in the unit. I think this is management problem...”*

In general, self-reported knowledge and practice report were shown to be below the required standard. Moreover, the findings from observation pin it to lower level of performance as 31% preparation procedures made before INC provision, 38% thermal care practice, 27.4% EEBF care practice and 20% eye care practice while newborn vaccination care scores the lowest among all practice observations (3.55%). However, proper resuscitation care and cord care practice were 73.3% and 69.1%, respectively.

### 5.2.2.1 Practice observation of INC in the facility

Out of the total 20 practice observations made, 14 complete observations were included in the analysis. From this, 7 (50%) of the care provides were male, 11 (78.6%) were in the age group of 25-29 and 6 (42.9%) were BSc mid-wives by profession. Regarding INC component practiced, resuscitation practice was more practiced than others as the study finding reported 73.3% followed by cord care practice (69%). Vitamin K injection was provided in only one-half of the newborns while the rest were below half. Moreover, newborn vaccination was the least practiced INC component as only 3.55%practice observed. Yet, illness management care wasn't observed during the practice observation. (See Table 4 and Appendix VI for the details).

Table 4: Practice Observation finding report to assess quality of INC at JUMC, March, 2018. (N=14)

INC	Average of correctly performed care			Overall performance
	Diploma midwives	BSC midwives	Physician	
<b>Preparation</b>	33.3	27.8	33.3	31.0
<b>Identification</b>	33.3	33.4	31.7	32.8
<b>Cord Care</b>	66.7	66.7	74	69.1
<b>Thermal care</b>	37.0	33.3	46.7	38.9
<b>EEBF care</b>	33.3	27.8	23.3	27.4
<b>Resuscitation care</b>	-	-	73.34	73.34
<b>Eye care</b>	19.98	13.34	28	20
<b>Illness mgt. care</b>	-	-	-	-
<b>LBW/preterm care</b>	-	31.25	56.25	43.75
<b>Vitamin K</b>	100	33.3	40	50
<b>General assessment</b>	16.675	20.85	5	14.3
<b>Give vaccination</b>	0	0	10	3.55

Moreover, evidences emerged from in-depth interviews shows that some INC components were missed and inappropriately provided. For instance, a 38 years old senior Obstetrician serving for 8 years mentioned the reason for inappropriate or missed INC as follows:

*“... As this hospital is referral hospital, specialist such as pediatricians and Neonatologists should have been there to provide INC care to the newborns. Most of the time, health care providers attending delivery are focusing on mothers by overlooking INC and that is why it is missed. I think we should work on this in future”.*

### 5.2.3 Outcome Dimension

The Outcome dimension was measured by maternal satisfaction on the INC provided including the hospital infrastructure. Based on factor analysis, the relative weight indices of outcome calculated using six satisfaction items which holds 16.1%. Accordingly, 73.7% of mothers were satisfied on the overall care provided to their newborns. The rest three items were analyzed separately (Table 5).

However, among 25 (6.5%) mothers whose newborns were given resuscitation care, only 9 (36%) were satisfied. In addition, out of 30 (7.8%) mothers who gave birth of LBW/ preterm babies, more than half (56.7%) of them were satisfied and all of those who were not satisfied claimed that they were given no information about their newborns’ health condition. Besides, among 39 (10.2%) mothers whose newborns’ had illness at birth, only 16 (41%) were satisfied. In contrast, more than half (50.8%) mothers were satisfied about immunization care provided to their newborns (Table 5).

Table 5: Proportion of maternal satisfaction on INC areas, JUMC, 2018

VARIABLE	SATISFACTION PERCENT
<b>Cord care provided to the newborn (384)</b>	<b>98.7</b>
<b>Hypothermia care (384)</b>	<b>92.7</b>
<b>Breast Feeding care (384)</b>	<b>78.9</b>
<b>Breathing initiation care (n=25)</b>	<b>36</b>
<b>Eye care (384)</b>	<b>73.7</b>
<b>LBW/preterm baby care (n=30)</b>	<b>56.7</b>
<b>Illness management care (n=39)</b>	<b>41</b>
<b>Immunization care (384)</b>	<b>50.8</b>
<b>Infrastructure (384)</b>	<b>87.0</b>
<b>Overall satisfaction (5 common items)</b>	<b>73.7</b>

Main reasons for no satisfaction on INC includes: did not get health information about EEBF 66 (80.5%), care providers didn't teach them about correct BF attachment 61 (74.4%), nothing is done as eye care to the newborn 54 (52.9%), didn't not see what the care providers did to their newborn 47 (46.1%), newborns didn't get vaccine 152 (80.4%), and mothers didn't received health information about complication management care and vaccination 126(66.7%).

Similarly, findings from In-depth interview also showed lack of communication. A 38 years old senior Gynecologist describes communication gap as follows:

*"...lack of communication is also there, some mothers are communicated in the postpartum period but others are not. They go home without getting enough information."*

Another informant whose age was 27 and MSC holder also said:

*"...for example, if blood sample is taken or vaccine is given, correct information is not given why this and that is done. Mothers have to know about the treatment provided to their baby and what they need to do. We have discussed always to improve this gap though there is no much improvement..."*

Another senior staff whose age was 35 eloquently spoke the cause of lack of constructive communication as problem in the way health care providers have been brought up professionally:

*"...our health care providers were not well equipped with effective communication and counseling skill in their training. As a result, now they tend to attribute to mothers when asked for missed and ineffective communication..."*

Likewise, practice observation report has also shown that newborn vaccination, eye care and EEBF care scored less proper performance than other INC components as the average score indicated 3.55%, 20% and 27.4% practice performance, respectively.

### **5.3. Overall quality of INC provided in the hospital**

Based on the three dimension quality of health care measurement indices, the overall quality of INC provided in the hospital is 61.9 % which is calculated from the three dimensions as each sub-scale were described above.

Table 6: The overall quality of immediate newborn care provided in JUMC, November, 2018

Dimensions	Subscales	Relative weight assigned (%)	Percent	Weight (%)
Structure (17.9%)	Practice environment	7.1	69.7	4.9
	Human resource	3.6	66.7	2.4
	Medication , equipment and Supplies	5.4	40.4	2.2
	Water supply	1.8	45.5	0.8
Process (66.0%)	practice self-report	32.1	57.6	18.5
	Provider knowledge	30.4	60.6	18.4
	Infection prevention practice	3.6	78.8	2.8
Outcome (16.1)	Maternal satisfaction	16.1	73.7	11.9
	Total	100.0		61.9

### 5.3.1 Predictors of outcome dimensions (maternal satisfaction)

Coming to factors associated with maternal satisfaction on INC, ten maternal attributes (Age of the mother, marital status, educational status, occupation, family monthly income, family sizes, number of births (parity), ANC visit, the hospital infrastructure and quality of INC rated by mothers) were entered in to bivariate analysis. From these, age of the mothers, occupation of the mother, family size, the hospital infrastructure and INC rate were candidate multivariate analysis having p-value less-than 0.25. The assumption was also checked with Hosmer-Lemeshow goodness of-fit-test model and the model was good fitted with p-value of 0.98; the overall hospital infrastructure and maternal quality of INC rated by mothers have shown an association. Accordingly, those mothers who reported the overall hospital infrastructure as good were nearly 3.6 times more likely to be satisfied with INC as compared to those who reported as poor with p-value of 0.01, (AOR=3.596, 95%CI= (1.36, 9.54)). Mother those who rated INC quality as good were also about five times more likely to be satisfied with INC care provided when compared to those who rated as poor with p- value of <0.001 (AOR= 4.95 , 95% CI= (2.91, 8.43)).

Table 7: Factors associated with maternal satisfaction on INC, JUMC, 2018

Variables	Category	Satisfaction		COR (95%CI)	AOR (95%CI)
		Not satisfied	Satisfied	P-value	P-Value
<b>Age</b>	<20	3	18	1	1
	20-24	29	94	.54 (.149, 1.965) 0.35	.86 (.221, 3.34) 0.83
	25-29	39	96	.41 (.114, 1.472) 0.17	.79 (.198, 3.11) 0.73
	30-34	18	48	.44 (.117, 1.692) 0.23	1.30 (.29, 5.79) 0.73
	>34	12	27	.375 (.093, 1.52) 0.17	1.37 (.28, 6.73) 0.70
<b>Occupation</b>	House wife	43	124	.564 (.26, 1.25) 0.16	.698 (.28, 1.74) 0.44
	Government and NGO employee	32	62	.379 (.17, .87) 0.02	.54 (.20, 1.42) 0.21
	Self-employee	10	39	.763 (.28, 2.07) 0.59	1.03 (.34, 3.16) 0.96
	Farmer	7	12	.335 (.10, 1.09) 0.07	.31 (.08, 1.13) 0.08
	Unemployed	9	46	1	1
<b>Family size</b>	1-4	59	202	1	1
	5-8	39	71	.53 (.33, .87) 0.01	.53 (.28, 1.00) 0.05
	>8	3	7	.68 (.17, 2.72) 0.59	.71 (.15, 3.43) 0.67
<b>Infrastructure</b>	Good	84	275	6.96 (2.90, 16.69) 0.00	<b>3.60 (1.36, 9.54) 0.01</b>
	Poor	17	8	1	<b>1</b>
<b>INC quality rated</b>	Good	41	229	6.21 (3.78, 10.19) 0.00	<b>4.95 (2.91, 8.43) 0.00</b>
	Poor	60	54	1	1

## CHAPTER SIX: DISCUSSION

The study aimed to assess the quality of immediate newborn care at JUMC maternity units. Thus, the study finding shows that the overall quality of INC was 61.9%, which is poor as compared to international quality care standard ( $\geq 80\%$ )(29). Even though slight variation was observed between the three INC quality assessment dimensions (structure, process and outcome), all of them were below international quality care requirements.

Therefore, it is an important information indicating that majority of the newborns in the hospital received a sub-standard care which might have been resulted in negative health outcomes in this critical and essential period (18,35). Compared to other study findings, the study finding is low as quality of INC report shows 76.9% in Egypt and 78% in India (5,20). This discrepancy could be due to lack of effective management, conducive infrastructures, lack of commitment and high work load. In addition, as it is a tertiary level hospital, others perceived that all performed to the standard as elaborated by interviewees.

Similarly, 65.7% of health care providers reported that the process dimension is good though there is variation among sub-scales as 60.6% of the study participants have good knowledge, 57.6% have good practice and 78.8% have good infection prevention practice self-report on INC.

Thus, the overall quality of process aspect report is also below minimum international standard recommended by WHO. When compared to other findings, the result is slightly lower as the overall INC knowledge report of the staffs was 69% in 11 Sub-Saharan African countries, 78% in India and 68% in Uganda (19,20) whereas, higher than the findings from Ethiopia (55%) (22). The variation in knowledge status could be due to the difference in study institutions as this is a teaching hospital and, also due to lack of in-service trainings for the staffs.

Similarly, the overall practice self-report was also vary from the study conducted in Tigray as 72.77% of care providers has good INC practice (17). Besides, there is variation in skill observation done as some of the INC steps were missed and very few participants provided complete INC that is also supported by in-depth interview findings. Yet, all aspects were below international standard that shows more focus is needed in the area. When compared to other findings, it is analogous with other practice findings as two to three steps were omitted or missed while care provision yet private hospitals scored the highest practice or skill compared to public

facilities (16,21). Concerning infection prevention, 78.8% of health care providers have good infection prevention practice self/report. However, none of them washed their hands before providing INC during practice observation; soap/detergent for hand washing wasn't available during data collection period. However, hand washing with soap and water is known by significantly decreasing the risk of morbidity and mortality (36). Study conducted in Bahir Dar on the same case came up with 74.6% of them washed their hands (18). This could be attributed to high work load, less adaptation of the staffs on hand washing practice, lack of water and reluctance in consistently supplying soap or detergents.

Likewise, infection prevention practice self-report that included newborn vaccination was the least to be practiced as study finding reported that less than half (45.5%) of them reported to have good infection prevention practice.

On the other hand, preparations before cord care meet the standard requirement (85.3%) while the rest were below eighty percent. As a whole, self-reported knowledge and practice report shows lower than the required standard. Moreover, the findings from observation pin it to lower level of performance though resuscitation care (73.3%) and cord care (69.1%) practice observations tells the other way during practice observation when compared to practice self-report. Study findings from India also reported high knowledge and poor skill or practice regarding on immediate newborn care as knowledge score of neonatal resuscitation was 76% while skill scores was 24% (29). Concerning vitamin K provision, majority, 83 (83.8%) of the study subjects reported to provided it for all newborns. However, practice observation finding have shown only half (50%) of the newborns received vitamin K injection. This shows that, though they have knowledge about it and claimed to provide, they don't actually practiced it. The finding shows variation from other study findings as vitamin K provision knowledge self-report was 100 % in Philippines, and 85.8% in Bahir Dar while lower than this (66.2%) in Tigray (17,18,25). The variation of the findings might be due to lack of essential medications and lack training. Moreover, other findings also affirmed that there is variation between knowledge and practice reporting 76% good knowledge and 55% good practice about vitamin K (20).

On the area of the hospital infrastructure in care givers perspective, nearly two-third (65.7%) of health care providers responded that the general hospital infrastructure is good to provide immediate newborn care which is slightly lower than others findings as 76.9% in Egypt and 78%



in India reported good basic infrastructure while higher than the study findings from Ethiopia hospitals which is 55%(5,20,22), and this could be due to management problem and current supply purchasing problem as mentioned by IDI participants.

Regarding hard copy of INC guideline availability and staff training, only half, 49(49.5%) of the respondents reported that ENC guideline is available while very few, 19 (19.2%) of them received ENC in-service training. When compared to other study findings, ENC guideline availability report is 74% in Vietnam while 12% in Addis Ababa (24,28). Whereas, 25.3% of the health care providers reported that lack of training affects quality of care provided to the newborns.(28) The variation could be due lack of training arrangement in the hospital and wisely use of expertise in the area.

Concerning staff reinforcement mechanisms, only 24 (24.2%) said that there is staff punishment mechanism in the institution. Moreover, interviewees also attested lack of ENC guideline hard copy, ENC training, motivation and punishment system in the institution that can affect quality of care. The study finding is relatively similar when compared to study conducted in Amhara region as only 28% reported that there was staff reinforcement mechanism (28).

Majority, 75 (75.8%) of the health care providers reported that there is lack of supply to provide immediate newborn care as well. However, findings from Ethiopian Hospital revealed that supply availability for newborn care was 70% and 73% which is in contrary to this finding (28,37). This great variation could be due to high demand and utilization of supplies in the hospital in addition to the current national marketing issue, problem of hard currency affirmed by interviewees. .

Besides, almost three-fourth (74.7%) of the health care providers reported that there is lack of medical supplies to provide INC which is followed by lack of continuous water supply (55%) and lack of essential medications (51.5%). This was also mentioned by in-depth interview participants as even there is lack of TTC eye ointments and no functional delivery vacuum in the unit. This finding is far beyond the findings from six sub-Saharan Africa as 76% of the health facilities have functional delivery Vacuum supplies (1) and 73.3% the respondents reported availability of basic supplies in Amhara region hospitals (28). This great variation could be due

to the reluctance of hospital management and concerned bodies to fulfill the supply shortage and over-utilization of supplies in the hospital.

Regarding outcome dimension which was measured by maternal satisfaction, 73.7% of the mothers were satisfied on the overall INC provided to their newborn though there was variation among each component. Accordingly, almost all (98.7%) of them were satisfied on cord care while only 36% of them were satisfied from those whose newborns' received resuscitation care. Hence, the overall satisfaction status of mothers is lower than the international standard recommended by WHO ( $\geq 80\%$ ).

Moreover, main reasons mentioned by mothers were unable to get health information, 126 (66.7%) and unable to get vaccination for their newborns among mothers who were not satisfied on vaccination care. When compared to study done in Gojam referral hospital, the study finding is lower as maternal satisfaction on advice for breast feeding and vaccination was about 60% (29). The difference might be due to the current in availability of supplies in the hospital and lack of proper communication which is supported by key informants.

In addition, mothers whose newborn's had illness were less-satisfied with the care provided compared to others as 23(59%) were not satisfied among 39 (10.2%) mothers. In contrary to this, out of 30 (7.8%) mothers who gave birth of preterm/LBW baby, more than half (56.7%) were satisfied with the care provided, and the main reason mentioned by all who were not satisfied was inability to be informed about their newborns' health status and procedures performed (care provided) to the newborns. Thus lack of good communication or health information has been detected as the main reason of dissatisfaction in addition to supply shortages which were mentioned by all interviewees.

However study conducted in Amahara region referral hospital and in Debre Markos showed 80% and 88.7% maternal satisfaction respectively (28,30). The variation could be due to difference in the sample size and poor communication skill as mentioned by in-depth interview participants.

Coming to factors associated with maternal satisfaction on INC provided in the hospital, two maternal attributes have shown association with their satisfaction. The assumption was checked with Hosmer-Lemeshow goodness of-fit-test model and the model was good fitted with p-value of 0.98; mothers who reported the hospital infrastructure as good were 3.6 times more likely to

be satisfied compared to those who reported as poor with p-value of 0.01(AOR=3.596, 95% CI= (1.36, 9.54)), and those mothers who rated the quality of INC provided in the hospital as good were nearly five times more likely to be satisfied when compared to those who rated as poor with p- value of <0.001 (AOR= 4.95, 95% CI= (2.91, 8.43)). Study conducted in Serbia also indicated that the hospital infrastructure has strong association with maternal satisfaction that has shown the lowest satisfaction among all care provided (26).

### **Strength and Limitation of the study**

The peculiar strong side of the study was addressing the users' perspective (assessing maternal satisfaction status as an outcome indicator). Triangulating the data with evidences emerged from qualitative analysis was also other strong side of the study. As a limitation, although the respondents were asked to respond genuinely assuring them that the information they gave would remain confidential, there could be social desirability bias on mothers' response and observational study. However, still readers and consumers of the result can get valuable inputs for the purpose they wanted for.

## **CONCLUSION**

The overall quality of INC in the hospital was below the international standard of care. In addition, the overall knowledge and practice self-report were also relatively low which shows there was knowledge gap. There was variation in skill observation as some of the INC steps were missed and not properly provided as well. Moreover, almost all study findings report on each INC components were below the international standard of care. Shortage of medical supplies were the main supply problem reported by health care providers among all. Besides, there was shortage of ENC guidelines, ENC training and staff reinforcement mechanisms in the hospital.

Concerning maternal satisfaction, the study findings reported that close to three-fourth of the mothers were satisfied on the INC provided to their newborn which is less than WHO recommendation. The main reason for no satisfaction was lack of information as most of the mothers reported that they didn't informed about newborn's health condition and intervention made. The hospital infrastructure and INC quality rated by mothers were strongly associated with maternal satisfaction.

## **RECOMMENDATIONS**

The following recommendations were forwarded based on the study findings:

### **MOH and Zonal health bureau should:**

- Design technical assessment and evaluation systems for the staffs
- Provide updated guidelines and facilitate trainings for all health professionals
- Allocate enough budget for supplies like detergent, water, warming towels/ clothes...
- Prepare pocket guide books which included all steps of ENC and provide staffs if possible

### **The hospital management should consider:**

- ENC training for all staffs working in the areas
- Avail hard copy of guidelines in all maternity units.
- Facilitate continuous monitoring and supervision by quality officers on technical competence
- Take on time and proper action to facilitate complete INC provision
- Plan and implement staff reinforcement mechanisms
- Work on making the working environment more conducive
- Give clear role and responsibilities to all health professionals
- Minimize gaps on the area of lack of medical supplies and design strategies to fulfill as much as possible to be available at all time to provide quality INC
- Consider fixing of non-functional supplies like delivery vacuum

### **Health care professionals should:**

- Practice all INC steps as per the standard in their day to day activities
- Update themselves by reading guidelines and other related materials
- Provide proper and complete health information to all mothers and/ attendants

## REFERENCES

1. De Graft-Johnson J, Vesel L, Rosen HE, Rawlins B, Abwao S, Mazia G, et al. Cross-sectional observational assessment of quality of newborn care immediately after birth in health facilities across six sub-Saharan African countries. *BMJ Open* [Internet]. 2017;7(3). Available from: <http://bmjopen.bmj.com/content/7/3/e014680>
2. WHO. Postnatal care of the mother and newborn 2013. *World Heal Organ* [Internet]. 2013;1–72. Available from: [http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf)
3. Trevisanuto D, Bertuola F, Lanzoni P, Cavallin F, Matediana E, Manzungu OW, et al. Effect of a neonatal resuscitation course on healthcare providers' performances assessed by video recording in a low-resource setting. *PLoS One*. 2015;10(12):1–34.
4. Roos N, von Xylander SR, Sethi R, World Health Organization, Meseka LA, Mungai LW, et al. Guidelines for Assessment of Skilled Providers After Training in Maternal and Newborn Healthcare. *Best Pract Res Clin Obstet Gynaecol* [Internet]. 2014;10(February):S47–64. Available from: [http://www.savethechildren.org/atf/cf/%7B9def2e2be-10ae-432c-9bd0-df91d2eba74a%7D/ENDING-NEWBORN-DEATHS\\_2014.PDF](http://www.savethechildren.org/atf/cf/%7B9def2e2be-10ae-432c-9bd0-df91d2eba74a%7D/ENDING-NEWBORN-DEATHS_2014.PDF)
5. Fattah E, Zein NA, Dein E. Assessment of Quality of Nursing Care Provided Immediately After Birth At University Hospital. 2012;9(4):2115–25.
6. Debelew GT, Afework MF, Yalew AW. Determinants and causes of neonatal mortality in jimma Zone, Southwest Ethiopia: A multilevel analysis of prospective follow up study. *PLoS One*. 2014;9(9).
7. Health P. Determinants of preterm birth at Jimma University Medical Center , southwest Ethiopia. 2018;101–7. Available from: <https://www.dovepress.com/determinants-of-preterm-birth-at-jimma-university-medical-center-south-peer-reviewed-article-PHMT>
8. UNICEF. Comprehensive needs assessment of newborn care in selected countries. 2013;(March).
9. Ending preventable newborn deaths in a generation,2015.
10. Dhingra U, Gittelsohn J, Suleiman AM, Suleiman SM, Dutta A, Ali SM, et al. Delivery, immediate newborn and cord care practices in Pemba Tanzania: A qualitative study of community, hospital staff and community level care providers for knowledge, attitudes, belief systems and practices. *BMC Pregnancy Childbirth*. 2014;14(1).
11. World Health Organizat. Early essential newborn care Clinical practice pocket guide. 2014;95. Available from: [http://iris.wpro.who.int/bitstream/handle/10665.1/10798/9789290616856\\_eng.pdf](http://iris.wpro.who.int/bitstream/handle/10665.1/10798/9789290616856_eng.pdf)
12. EDHS K findings. Ethiopia. 2016; Available from: <https://dhsprogram.com/pubs/pdf/FR328/FR328.pdf>
13. Federal Ministry of Health, Ethiopian Health and Nutrition Research Institute. Baseline evaluation of maternal and newborn health care services in 25 selected Woredas [Internet]. 2013. Available from: [https://ciff.org/documents/53/Ethiopia\\_MNHCS\\_2013\\_evaluation.pdf](https://ciff.org/documents/53/Ethiopia_MNHCS_2013_evaluation.pdf)
14. Obara H, Sobel H. Quality maternal and newborn care to ensure a healthy start for every newborn in the World Health Organization Western Pacific Region. *BJOG* [Internet]. 2014;121:154–9. Available from: <https://obgyn.onlinelibrary.wiley.com/doi/pdf/10.1111/1471-0528.12943>
15. WHO. Hospital care for mothers and newborn babies : quality assessment and improvement tool. *WHO J* [Internet]. 2014;1(1):5. Available from: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/244831/Hospital-care-for-mothers-and-newborn-babies-quality-assessment-and-improvement-tool.pdf](http://www.euro.who.int/__data/assets/pdf_file/0004/244831/Hospital-care-for-mothers-and-newborn-babies-quality-assessment-and-improvement-tool.pdf)
16. Suliman A, Ahmed M. Assessment Knowledge and Practice of Nurses Midwife Regarding Immediate Health New Borne Care in Khartoum and Khartoum North Teaching Hospital ( Labour Room ). 2015;4(2):47–8.
17. Berhe AK, Tinsae F, Gebreegziabher G. Knowledge and practice of immediate newborn care among health care providers in eastern zone public health facilities, Tigray, Ethiopia, 2016. *BMC Pediatr*. 2017;17(1):1–9.
18. Dagnachew E. Knowledge and Practice of Immediate New Open Access Born Care ( Inc .) among Health Professionals in Governmental Health Facilities of Bahir Dar City ,. 2017;25:360–7. Available from: <http://primarycare.imedpub.com/knowledge-and-practice-of-immediate-newborn-care-inc-among-health-professionals-ingovernmental-health-facilities-of-bahir-dar-city.pdf>
19. Bee M, Shiroor A, Hill Z. Neonatal care practices in sub-Saharan Africa : a systematic review of quantitative and qualitative data. 2018;1–12. Available from: <https://jhpn.biomedcentral.com/articles/10.1186/s41043-018-0141-5>
20. Malhotra S, Zodpey SP, Vidyasagaran AL, Sharma K, Raj SS, Neogi SB, et al. Assessment of Essential Newborn Care Services in Secondary-level Facilities from Two Districts of India. 2014;32(1):130–41. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4089081/>
21. Access O. implementation progress in Uganda. 2014;8688:1–10.
22. Plotkin M, Tibaijuka G, Makene CL, Currie S, Lacoste M, Care N. Quality of Care for Prevention and Management of Common Maternal and Newborn Complications: A study of 12 regions in Tanzania. 2011.

23. Baker U, Hassan F, Hanson C, Manzi F, Marchant T, Peterson SS, et al. Unpredictability dictates quality of maternal and newborn care provision in rural Tanzania-A qualitative study of health workers' perspectives. 2017;1–11. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28166745>
24. Eriksson L, Nga NT, Målqvist M, Persson L-åke, Ewald U, Wallin L. Human Resources for Health Evidence-based practice in neonatal health: knowledge among primary health care staff in northern Viet Nam. 2009;10:1–10. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/19393073>
25. Sobel HL, Silvestre MAA, Mantaring JB V., Oliveros YE, Nyunt-U S. Immediate newborn care practices delay thermoregulation and breastfeeding initiation. *Acta Paediatr Int J Paediatr*. 2011;100(8):1127–33.
26. Mateji B, Milena Š, Vasi V, Djikanovi B. Maternal satisfaction with organized perinatal care in Serbian public hospitals. 2014;
27. No Title. 2016;1–456.
28. Yigzaw T, Abebe F, Belay L, Assaye Y, Misganaw E, Kidane A, et al. Quality of Midwife-provided Intrapartum Care in Amhara Regional State, Ethiopia. 2017;1–12. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28814285>
29. Asres GD. Satisfaction of maternal care among women delivered at Asrade Zewude Memorial Primary Hospital, Bure, West Gojjam, Amhara, Ethiopia: A cross sectional study. 2018;10(May):147–54. Available from: <https://www.academicjournals.org/journal/JPHE/article-full-text-pdf/18A775756713>
30. Bitew K, Ayichiluhm M, Yimam K. Maternal Satisfaction on Delivery Service and Its Associated Factors among Mothers Who Gave Birth in Public Health Facilities of Debre Markos Town, Northwest Ethiopia. 2015;2015:1–7.
31. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. 2017;(February):14–6. Available from: [http://www.who.int/maternal\\_child\\_adolescent/documents/improving-maternal-newborn-care-quality/en/](http://www.who.int/maternal_child_adolescent/documents/improving-maternal-newborn-care-quality/en/)
32. Dewana Z. Quality of Delivery Service at Public Health Facilities in Arba Minch District, Gamo Gofa Zone, Southern Ethiopia. *J Gynecol Obstet* [Internet]. 2017;5(2):31. Available from: <http://www.sciencepublishinggroup.com/journal/paperinfo?journalid=255&doi=10.11648/j.jgo.20170502.12>
33. Tura G, Fantahun M, Worku A. Neonatal care practice and factors affecting in Southwest Ethiopia: A mixed methods study. *BMC Int Health Hum Rights*. 2015;15(1):1–10.
34. World Health Organization (WHO). Standards for improving quality of maternal and newborn care in health facilities. *Stand Improv Qual Matern newborn care Heal Facil* [Internet]. 2016;73. Available from: [http://www.who.int/reproductivehealth/publications/maternal\\_perinatal\\_health/improving-mnh-health-facilities/en/](http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/improving-mnh-health-facilities/en/), accessed 2 February 2017
35. Faiza Ali. No Title. 2013;9(9). Available from: [http://khartoumspace.uofk.edu/bitstream/handle/123456789/23743/034\\_20235am0909\\_263\\_270ICNB.pdf?sequence=1&isAllowed=y](http://khartoumspace.uofk.edu/bitstream/handle/123456789/23743/034_20235am0909_263_270ICNB.pdf?sequence=1&isAllowed=y)
36. White I. Optical local area networks using uncooled photonic components. *Ict 2003 5th Int Conf Transparent Opt Networks, Vol 2, Proc* [Internet]. 2003;200. Available from: [http://www.who.int/gpsc/5may/tools/who\\_guidelines-handhygiene\\_summary.pdf](http://www.who.int/gpsc/5may/tools/who_guidelines-handhygiene_summary.pdf)
37. Vesel L, Manu A, Lohela TJ, Gabrysch S, Okyere E, Asbroek AHA, et al. Quality of newborn care: a health facility assessment in rural Ghana using survey, vignette and surveillance data. 2013;1–11. Available from: <https://bmjopen.bmj.com/content/3/5/e002326>

## APPENDICES

**Questionnaire developed to assess Mothers' Satisfaction on Immediate Newborn Care in JUMC, March, 2018.**

*Today's date* \_\_\_\_\_

*(Day/ month/ year)*

*Observer number (code):* \_\_\_\_\_

**The Study Objective will be explained in addition to notifying her that her name will not be mentioned while knowledge Status is assessed. She will also be asked to give her Consent to participate in the study.**

S.No	QUESTION	RESPONSE	SKIP
<b>Part I: Background Characteristics</b>			
M101	Age of the mother in year	_____	
M102	Marital status	1. Married 2. Divorced 3. Widowed 4. Single 5. Separated	
M103	Educational status of mother	1. Cannot be able to read and write 2. Can read and write 3. Grade completed _____ 4. College and above	
M104	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Wakefata 6. Other, specify _____	
M105	Ethnicity	_____	
M106	Occupation of mother	1. House wife 2. Merchant 3. Student 4. Government employer 5. NGO employer 6. Daily laborer 7. Other, specify _____	
M107	Place of residence	1. Urban 2. Rural	
M108	Family size in number	_____	
M109	Estimated family income in months/ in year.	_____/month OR _____/ year	
M110	Which media you mostly use to get health	1. Radio 2. TV	



	information?	3. Books 4. Posters, leaflets 5. Other, specify _____	
<b>Obstetric History</b>			
M201	How many pregnancies have you ever had, including current pregnancy, abortion and stillbirth?	_____times	
M202	How many of them shown signs of life?	_____	
M203	Did any of these pregnancies ended in abortion (termination of pregnancy before 28 weeks of gestation)?	1. Yes 2. No	If “No” skip to QM205
M204	If Yes, how many of them ended in abortion?	_____	
M205	Did any of these pregnancies ended in stillbirth (delivery ended in birth of dead fetus after 28 weeks of gestation)?	1. Yes 2. No	If “No” skip to QM207
M206	If Yes, how many of them ended in still birth?	_____	
M207	Had you attended ANC for your last (this) child?	1. Yes 2. No	If “No” Skip to QM301
M208	If Yes, how many visits did you have?	_____ (in number)	
<b>Part II: Knowledge and satisfaction related questions</b>			
<b>Hygienic Cord care Questions</b>			
M301	Do you know how to give cord care?	1. Yes 2. No	
M302	Do you think that the care provider give proper cord care to your baby?	1. Yes 2. No	
M303	How do you rate the overall cord care provided?	1. Good 2. Fair 3. Poor	
M304	Are you satisfied with the way cord care is provided?	1. Yes 2. No	If “Yes” skip to QM401
M305	If no, why?	_____	
<b>Thermal protection</b>			
M401	Did you bring clean towel/ cloth to cover the newborn?	1. Yes 2. No	
M402	Where is preferable to put the baby immediately after birth?	1. On mother’s abdomen/ arm 2. On bed nearby mother’s side 3. Given to my attendant 4. Other, specify _____	
M403	Where did the care provider put the newborn immediately after birth?	_____ _____	
M404	Was the delivery room, where immediate newborn care is given warm?	1. Yes 2. No	
M405	Do you think the baby was properly protected from fall in body heat?	1. Yes 2. No	

M406	How do you rate the overall care given to keep newborn warm by care provider?	1. Good 2. Fair 3. Poor	
M407	Are you satisfied on care provided to prevent fall in newborn body temperature?	1. Yes 2. No	If “Yes” skip to QM501
M408	If no, why?	_____	
<b>Early and exclusive breast feeding</b>			
M501	When is the right time to initiate breast feeding?	1. Immediately after delivery 2. Within one hour after delivery 3. After one hour of delivery 4. After placenta is removed 5. I do not know 6. Other, _____	
M502	When do you start breast feeding the baby?	Approximately after _____ hr/s of delivery.	
M503	How do you rate the overall exclusive breast feeding initiation support?	1. Good 2. Fair 3. Poor	
M504	Are you satisfied on the care and assistance given during breast feeding?	1. Yes 2. No	If “Yes” skip to QM601
M505	If no, why?	_____	
<b>Initiation of breathing/ resuscitation</b>			
M601	Was the newborn cry immediately after birth?	1. Yes 2. No	If “yes” skip to QM601
M602	If no, What did the care provider do to initiate breathing?	1. Call for help 2. Clamp and cut cord immediately 3. Transfer the newborn to warm & firm surface 4. Assess if there is blockage of mouth and nose 5. Suctioning baby’s mouth and nose 6. Resuscitate the baby until regain breathing 7. Other, _____	
M603	How do you rate the overall care provision for breathing initiation?	1. Good 2. Fair 3. Poor	
M604	Have you been satisfied for what has been done for the new born to initiate breathing?	1. Yes 2. No	If “Yes” skip to QM701
M605	If no, why?	_____	
<b>Eye care</b>			
M701	What type of care do you know to be given to the newborn eyes?	_____	
M702	What did the care provider applied to your baby’s eyes/ how is the care given?	_____	

M703	How do you rate the overall eye care provided to your newborn baby?	Good Fair Poor	
M704	Are you happy on how the eye care is given to your baby?	Yes No	If “Yes” skip to QM801
M705	If no, why?	_____	
<b>Care of preterm/ low birth weight baby</b>			
M801	Have you give birth of preterm/ LBW baby? (record book checked)	Yes No	If “No” skip to QM901
M802	If yes, what have been done to the newborn?	_____ _____	
M803	How do you rate the overall care provided to your newborn baby?	Good Fair Poor	
M804	Are you satisfied with the care given to the newborn?	Yes No	If “No” skip to QM901
M805	If no, why?	_____	
<b>Newborn illness, infection management</b>			
M901	Do your child have any of the signs immediately after birth?	Yes No	If “No” skip to QM1001
M902	If yes, What was/ were the signs?	_____	
M903	How do you rate the overall illness and infection assessment and management?	Good Fair Poor	
M904	Are you satisfied with what have been done for your baby?	Yes No	If “Yes” skip to QM1101
M905	If no, why?	_____ _____	
<b>Immunization</b>			
M1001	Did the child received the vaccines?	Yes No	
M1002	How do you rate the overall immunization care and information provision?	Good Fair Poor	
M1003	Are you satisfied on what is done for your child regarding child immunization?	Yes No	If “Yes” skip to QM1101
M1004	If no, why?	_____ _____	
<b>PART III: Health Care infrastructure questions</b>			
M1101	Do you think the unit is physically clean?	Yes No	
M1102	Do you think the hospital has adequate professional staffs?	Yes No	
M1103	Is the hospital environment comfortable for you and other clients?	Yes No	If “Yes” skip to Q1306
M1104	If, no why?	_____ _____	
M1105	Is there lack of supplies in the unit?	Yes No	If “No” skip to Q1308

M1106	If yes, what is lacking?	Medication Clothing Laboratory investigation Other, _____	
M1107	Is there functional toilet in the unit?	Yes No	
M1108	How do you rate the overall hospital infrastructure?	Good Fair Poor	
M1109	Are you satisfied with the general infrastructure of the hospital?	Yes No	If "Yes" skip to Q1110
	If no, what makes you unsatisfied?	_____	
M1110	How do you rate the overall immediate newborn care provided to your baby?	Very good Good Fair Poor Very poor	

**Appendix II: Questionnaire Developed for Health Care Providers To Asses Knowledge Status on Immediate Newborn Care in JUMC, Jimma, Ethiopia, 2018.**

*Health Worker working in maternity unit will be asked if he/ she is willing to be involved in the study conducted on Immediate Newborn Care quality. Verbal Consent will be obtained after explaining objective of the study. The participants also notified that her/his name will not be mentioned in any case while assessing quality of immediate newborn care. She/ he will be asked to give her/ his Consent before participation in the study.*

Today's date \_\_\_\_\_

(Day/ month/ year)

Participant number (code): \_\_\_\_\_

S.No	Question	Response	Skip
<b>I</b>	<b>Part I: Socio-demographic Characteristics</b>		
H101	Age of health professional in year	_____	
H102	Sex	1. Male 2. Female	
H103	Marital status	2. Married 3. Divorced 4. Widowed 5. Single 6. Separated	
H104	Educational level	1. Diploma (midwife/ Nurse) 2. First degree (midwife/ Nurse) 3. General physician 4. MSC in maternity nursing 5. Obstetrics and gynecology specialization: R1, R2,R3,R4 ( <b>circle the correct level</b> ) 6. Senior Obstetrician /Gynecologist 7. Anesthesiologist/ Anesthetist 8. OR nursing specialty 9. Other, specify_____	
H105	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Wakefata 6. Other, specify_____	

H106	Ethnicity	1. Oromo 2. Amhara 3. Kafa 4. Dawuro 5. Yem 6. Gurage 7. Tigre 8. Other, specify_____	
H107	Monthly income in Birr (without par time payments)	_____ _____	
H108	Your current qualification & year of graduation	_____ _____	
H109	Current position	_____	
H110	Duration of stay in the unit	_____	
<b>II</b>	<b>Part II: knowledge related questions</b>		
	<b>Step I: Clean cord care</b>		
H201	What should be prepared before delivery of the baby to give cord care?  <i>(multiple response is possible)</i>	1. Sterile glove 2. Sterile Cord clamp 3. Sterile Cord tie 4. Sterile cord cut 5. Other, _____	
H202	How do you give cord care to the newborn?  <i>(multiple response is possible)</i>	1. Clamp and Cut with sterile scissor 2. Check for bleeding 3. Apply nothing and leave to dry 4. Cover with clean clothes 5. Wash with clean water & dry it if soiled with urine/ meconium 6. Other, specify_____	
H203	When is the appropriate time to tie the cord?  <i>(multiple response is possible)</i>	1. Before one minute of birth for baby without complication 2. After pulsation stops or 2-3 minutes after birth 3. Immediately after birth 4. Other,_____	
H204	Do you teach mothers' about cord care and sign of cord infection?	1. Yes 2. No	
	<b>Step II: Thermal protection</b>		
H301	How do you prevent hypothermia from newborn baby?  <i>(multiple response is possible)</i>	1. Deliver baby on to mothers' abdomen 2. Thoroughly dry baby immediately 3. Discard wet cloth. 4. Cover/wrap baby with dry cloth 5. Leave baby on mother's chest in skin to skin contact 6. Cover baby's head with a hat 7. Cover mother & baby with blanket 8. Check the baby's body temperature	

		<ul style="list-style-type: none"> <li>9. Make sure the room is warm</li> <li>10. Teach mother about signs and prevention methods</li> <li>11. Delay bathing of newborn</li> <li>12. Other, specify _____</li> </ul>	
<b>H303</b>	<p>What are the possible signs of hypothermia?</p> <p><i>(multiple response is possible)</i></p>	<ul style="list-style-type: none"> <li>1. Less active baby</li> <li>2. Lethargy</li> <li>3. Hypotonic</li> <li>4. Poor breast sucking</li> <li>5. Cry weakly</li> <li>6. Other, _____</li> </ul>	
<b>H304</b>	When do you advise mothers for bathing newborn baby?	<ul style="list-style-type: none"> <li>1. after 24 hours</li> <li>2. Before 24 hours after birth</li> <li>3. Other, _____</li> </ul>	
<b>H305</b>	Do you assess for hyperthermia?	<ul style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ul>	If "No" skip to QH401
<b>H306</b>	<p>If yes, what are the possible signs?</p> <p><i>(multiple response is possible)</i></p>	<ul style="list-style-type: none"> <li>1. Fast breathing</li> <li>2. Baby becomes irritated</li> <li>3. Increased heart rate</li> <li>4. Hot and dry skin</li> <li>5. Coma, stupor</li> <li>6. Body temperature &gt;37.5 °C</li> <li>7. Other, _____</li> </ul>	
<b>Step III: early and exclusive breast feeding</b>			
<b>H401</b>	When do you initiate breast feeding?	<ul style="list-style-type: none"> <li>1. Within 1 hour after birth</li> <li>2. After 1 hour of birth</li> <li>3. Other, specify _____</li> </ul>	
<b>H402</b>	Do you support mothers to initiate breast feeding?	<ul style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ul>	
<b>H403</b>	<p>What should be considered while initiation of breast feeding?</p> <p><i>(multiple response is possible)</i></p>	<ul style="list-style-type: none"> <li>1. Encourage/ initiate breast feeding</li> <li>2. Assess breast by expressing colostrum during initiation</li> <li>3. Teach proper attachment</li> <li>4. Teach the advantage of early initiation and exclusive BF</li> <li>5. Recommend feeding the baby continuously on demand</li> <li>6. Other, specify _____</li> </ul>	
<b>Step IV: Initiation of breathing/ resuscitation</b>			
<b>H501</b>	<p>When should the newborn be assessed for birth asphyxia?</p> <p><i>(Multiple response is possible)</i></p>	<ul style="list-style-type: none"> <li>1. While drying or within the first minute.</li> <li>2. After 5 minutes</li> <li>3. Any time after birth</li> <li>4. Other specify _____</li> </ul>	
<b>H502</b>	<p>When do you resuscitate newborn?</p> <p><i>(multiple response is possible)</i></p>	<ul style="list-style-type: none"> <li>1. If the newborn do not cry at birth</li> <li>2. If there is difficulty of breathing</li> <li>3. When the newborn gasps</li> <li>4. Other, _____</li> </ul>	

<b>H503</b>	What are causes of birth asphyxia?  <i>(multiple response is possible)</i>	<ol style="list-style-type: none"> <li>1. Preterm birth</li> <li>2. Prolonged/ Obstructed labor</li> <li>3. Cesarean section delivery</li> <li>4. Infection</li> <li>5. Other, _____</li> </ol>	
<b>H504</b>	What should be done for initiation of breathing?  <i>(multiple response is possible)</i>	<ol style="list-style-type: none"> <li>1. Call for help</li> <li>2. Clamp and cut cord immediately</li> <li>3. Transfer the newborn to warm &amp; firm surface</li> <li>4. Inform the mother in a kind and gentle tone about condition and what you are doing</li> <li>5. Use appropriate size mask/ bag</li> <li>6. Assess if there is blockage of airway</li> <li>7. Suctioning baby's mouth and nose</li> <li>8. Resuscitate the baby until breathing regained, &gt;30/min</li> <li>9. Other, specify _____</li> </ol>	
<b>H505</b>	When is APGAR scoring?	<ol style="list-style-type: none"> <li>1. In the 1st and 5th minute after birth</li> <li>2. In the first minute only</li> <li>3. At 5th minute only</li> <li>4. After 10 minutes</li> <li>5. Other, specify _____</li> </ol>	
<b>Step V: Eye care</b>			
<b>H601</b>	How do you give eye care?  <i>(multiple response is possible)</i>	<ol style="list-style-type: none"> <li>1. Clean/ wipe eyes with sterile gauze</li> <li>2. Examine eyes for sign of infection</li> <li>3. Apply TTC eye ointment 1%</li> <li>4. Tell to mother why the care is given</li> <li>5. Other, _____</li> </ol>	
<b>H602</b>	What are you checking for during eye examination?  <i>(multiple response is possible)</i>	<ol style="list-style-type: none"> <li>1. Redness</li> <li>2. Swelling</li> <li>3. Pus draining</li> <li>4. Jaundice/ yellowish discoloration</li> <li>5. Other, specify _____</li> </ol>	
<b>Step VI: care of preterm/ low birth weight baby</b>			
<b>H701</b>	What should be done for preterm/ low birth weight baby?  <i>(multiple response is possible)</i>	<ol style="list-style-type: none"> <li>1. Weigh the baby</li> <li>2. Determine gestational age</li> <li>3. Express breast milks to baby's mouth if unable to suckle</li> <li>4. Give more warmth</li> <li>5. Check breathing</li> <li>6. Assess its condition frequently</li> <li>7. Provide additional care as needed</li> <li>8. Other, _____</li> </ol>	
<b>H702</b>	How often should the baby's condition be monitored after resuscitation?	<ol style="list-style-type: none"> <li>1. Every 15 minutes</li> <li>2. After 30 minute</li> <li>3. Every hour</li> <li>4. Do not know</li> </ol>	



		5. Other, _____	
<b>H703</b>	How do you communicate with mothers before doing a procedure?  <i>(multiple response is possible)</i>	1. By introducing the procedure 2. By introducing the purpose of the procedure. 3. Encouraging mother to ask if she has question or worries about the procedure 4. Responding to her questions respectfully 5. Other, _____	
<b>Step VII: Newborn illness, infection management</b>			
<b>H801</b>	What are signs of infection in newborn?  <i>(multiple response is possible)</i>	1. Fast breathing 2. Tachycardia (PR > 160) 3. Difficulty breathing 4. Granting 5. Unable to breast feed 6. Fever 7. Cold to touch 8. Vomiting 9. Pus drainage from eye 10. Jaundice 11. Convulsion/ unconsciousness 12. Other, _____	
<b>H802</b>	How do you manage if there is any sign of infection detected?  <i>(multiple response is possible)</i>	1. Consult responsible professionals 2. Request for laboratory findings 3. Put on appropriate antibiotics 4. Frequent assessment for improvement or change 5. Teach mothers to differentiate and notify care providers 6. Other, _____	
<b>H803</b>	What other assessment is needed?  <i>(multiple response is possible)</i>	1. Head circumference 2. Abdominal circumference 3. Limb abnormality/ dislocation 4. Congenital anomalies 5. Injuries on body parts 6. Swellings/ abnormal growth 7. Deformities 8. Other, _____	
<b>H804</b>	After thorough examination of newborn, what measures do you take?  <i>(multiple response is possible)</i>	1. Record findings on record book 2. Communicate to responsible others 3. Take corrective measures if possible 4. Explain findings to mother politely 5. Other, specify _____	
<b>H805</b>	Do you provide vitamin K for all newborn babies?	1. Yes 2. No	If "Yes" skip- <b>QH901</b>
<b>H806</b>	If no, Why?  <i>(multiple response is possible)</i>	1. Absence / lack of vitamin K in the unit 2. Not necessary to give to all babies 3. When Parents unable to buy it 4. Other, _____	
<b>Step VIII: Immunization</b>			

<b>H901</b>	Please mention vaccines recommended at birth	_____	
	How do you provide the vaccines after birth? <i>(multiple response is possible)</i>	1. Refer to EPI unit 2. Provide vaccine in the unit 3. Appoint the mother to bring the baby another time 4. Other, _____	
<b>H902</b>	Do you ask mothers about their belief / worries on immunization?	1. Yes 2. No	
<b>III</b>	<b>Part III: Health Care infrastructure questions</b>		
<b>H1001</b>	Is Essential newborn care guideline available in the unit?	1. Yes 2. No	
<b>H1002</b>	Did you receive in-service training on Immediate newborn care?	1. Yes 2. No	
<b>H1003</b>	Is there clean adequate space to provide immediate newborn care?	1. Yes 2. No	If "Yes" skip to QH1005
<b>H1004</b>	If no, why?	1. The room is too small 2. Overcrowded by students, others 3. Poor room cleanliness due to inadequate cleaners 4. Cleaners' poor knowledge 5. Other, specify _____	
<b>H1005</b>	Do you think the hospital has adequate professional staffs?	1. Yes 2. No	
<b>H1006</b>	Is there any staff motivation for quality care provision in the unit?	1. Yes 2. No	If "No" skip to QH1011
<b>H1007</b>	If yes, Please mention them	_____	
<b>H1008</b>	Is there any punishment system of staff for ill-treatment in the unit?	1. Yes 2. No	If "No" skip to QH1013
<b>H1012</b>	If yes, mention them.	_____	
<b>H1013</b>	Is there continuous supply of water in the unit?	1. Yes 2. No	
<b>H1014</b>	Is the health facility environment comfortable to provide immediate newborn care?	1. Yes 2. No	If "yes" skip to QH1017
<b>H1015</b>	If no, what makes not comfortable	_____	
<b>H1016</b>	Is there lack of supplies to provide immediate newborn care?	1. Yes 2. No	
<b>H1017</b>	If yes, can you specify what is lacking? <i>(Multiple response is possible)</i>	1. Medical supplies/ material 2. Lack of space 3. Lack of man power 4. Lack of medication & antibiotics 5. Other, specify _____	

### Appendix III: Observational checklist prepared to assess health care providers' skill on immediate newborn care in JUMC, Jimma, Ethiopia, 2018

*Find a Health Worker Involved In Immediate Newborn Care Services. If This Is a New Respondent, Obtain Informed Consent Below. If the Person Is Not A New Respondent, Proceed to The Observation. Before Observing the Consultation, Make Sure To Obtain Permission From Both The Service Provider And The Client. Also Make Sure That The Provider Knows That You Are Not There to Evaluate Him Or Her, And That You Are Not An "Expert" To Be Consulted During The Session. Read Oral Consent Script To Health Worker To Get Prior To Start Observation.*

S.No	Question	Response	Skip
<b>Part I: Background Characteristics</b>			
O101	Age in year	_____	
O102	Sex	1. Male 2. Female	
O103	Qualification		
O104	Responsibility / position he/ she has	_____ _____	
O105	Trained for essential newborn care	1. Yes 2. No	
<b>PART II: Skill Observation- Observe if the activity is done. (circle the response code)</b>			
<b>Hygienic cord care</b>			
O201	Instrument prepared before delivery of the baby to give cord care(sterile cord clamp, cut & glove)	1. Done 2. Not done	
O202	Wash hands or alcohol hand rub before wearing sterile glove	1. Done 2. Not done	
O203	Sterile Glove is worn to give cord care	1. Done 2. Not done	
O204	Call out time of birth and sex of newborn	1. Done 2. Not done	
O205	Sterile blade or scissor is used to cut cord	1. Done 2. Not done	
O206	Sterile cord tie is used to tie the cord	1. Done 2. Not done	
O207	Cord tied after pulsation stops or 2-3 minutes (observe if checked)	1. Done 2. Not done	
O208	The baby is weighed	1. Done 2. Not done	
O209	APGAR scoring in the first and fifth minutes	1. Done 2. Not done	
O210	Identification tag is applied	1. Done 2. Not done	
O211	Cord is checked for bleeding	1. Done 2. Not done	
O212	Cord covered with clean clothes without applying nothing	1. Done 2. Not done	
<b>Thermal protection</b>			

O301	Newborn is placed on mother's abdomen/ chest immediately after birth.	1. Done 2. Not done	
O302	The baby's body is Wiped or thoroughly dried immediately with towel/ cloth	1. Done 2. Not done	
O303	Wet towel is discarded	1. Done 2. Not done	
O304	Cover/wrap baby with dry cloth or towel	1. Done 2. Not done	
O305	Leave baby on mother's chest in skin to skin contact	1. Done 2. Not done	
O306	Cover baby's head with a hat	1. Done 2. Not done	
O307	Cover mother & baby with blanket	1. Done 2. Not done	
O308	Make sure the room is warm	1. Done 2. Not done	
O309	Check the baby's body temperature	1. Done 2. Not done	
O310	Teach mother about the signs and prevention method, tell her to delay bathing	1. Done 2. Not done	
	<b>Early and exclusive breast feeding</b>		
O401	Brest feeding initiated within 1 hour after birth	1. Done 2. Not done	
O402	The mother is assisted / supported to breast feed the baby early	1. Done 2. Not done	
O403	Assess breast condition by expressing colostrum during initiation	1. Done 2. Not done	
O404	Encourage the mother feeding the baby continuously on demand.	1. Done 2. Not done	
O405	Teach good attachment of breast feeding	1. Done 2. Not done	
O406	Teach the purpose of early and exclusive breast feeding	1. Done 2. Not done	
	<b>Initiation of breathing/ resuscitation</b>		
O501	Assess newborn breathing for birth asphyxia while drying or in the first minute after birth	1. Done 2. Not done	
O502	Call for help if the baby do not cry, has difficulty of breathing or gasping	1. Done 2. Not done	
O503	Clamp and cut the cord quickly	1. Done 2. Not done	
O504	Transfer the neonate to warm, flat & firm surface	1. Done 2. Not done	
O505	Suction the baby's mouth and nose initially to remove secretion or blockage	1. Done 2. Not done	
O506	Cover the baby except head and chest	1. Done 2. Not done	
O507	Extend head slightly for trachea to be open	1. Done 2. Not done	
O508	Use clean and right size mask to cover chin, mouth and nose to achieve sealing	1. Done 2. Not done	
O509	Eyes do not be covered with mask	1. Done 2. Not done	

O510	Ventilation started by squeezing bag attached to the mask with two fingers or whole hand	1. Done 2. Not done	
O511	Observe rise of chest	1. Done 2. Not done	
O512	Ventilate at 40-50 breaths per minute until baby starts crying or breathing	1. Done 2. Not done	
O513	Assess breathing status while ventilating/ resuscitating	1. Done 2. Not done	
O514	Explain to the mother gently that the baby needs assistance to breath	1. Done 2. Not done	
O515	Recording the newborn baby's condition	1. Done 2. Not done	
	<b>Eye care</b>		
O601	Clean/ wipe eyes with sterile gauze	1. Done 2. Not done	
O602	Examine eyes for sign of infection/ illness (swelling, redness, pus discharge, jaundice)	1. Done 2. Not done	
O603	Apply TTC eye ointment 1%	1. Done 2. Not done	
O604	Tell to mother why the eye care is given	1. Done 2. Not done	
O605	Record the procedure ,report to responsible body if there is any abnormality	1. Done 2. Not done	
	<b>Care of preterm/ low birth weight baby</b>		
O701	The baby is weighed to determine LBW	1. Done 2. Not done	
O702	Gestational age determined (confirmed)	1. Done 2. Not done	
O703	More warmth and attention given to LBW baby	1. Done 2. Not done	
O704	Breathing checked	1. Done 2. Not done	
O705	Frequent assessment	1. Done 2. Not done	
O706	Express breast milks to baby's mouth if unable to suckle	1. Done 2. Not done	
O707	Provide additional care based on the baby's condition	1. Done 2. Not done	
O708	Kangaroo baby care if the baby is in good condition	1. Done 2. Not done	
	<b>Newborn illness, infection management</b>		
O801	Assess for sign of infections (fast breathing, Tachycardia (PR > 160), difficulty breathing, grunting, chest indrawing, unable to breast feeding, fever, cold to touch, vomiting, pus drainage from eye, jaundice & convulsion/ unconsciousness)	1. Done 2. Not done	
O802	Manage infection by consulting responsible professional if there is any sign of infection.	1. Done 2. Not done	
O803	Request for confirmatory laboratory findings	1. Done 2. Not done	
O804	Put the newborn on appropriate antibiotics	1. Done 2. Not done	

O805	Frequent assessment for improvement or change	1. Done 2. Not done	
O806	Inform mothers to differentiate and notify any change to care providers	1. Done 2. Not done	
O807	Record findings on record book	1. Done 2. Not done	
O808	Communicate to responsible others	1. Done 2. Not done	
O809	Take necessary corrective measures if possible	1. Done 2. Not done	
O810	Explain findings to mother politely	1. Done 2. Not done	
O811	Single dose Vitamin K Injection is provided (1 mg IM) <i>to all newborn babies</i>	1. Done 2. Not done	
O812	Newborn is thoroughly examined for abnormalities, dislocations, birth injuries and congenital anomalies.	1. Done 2. Not done	
O813	Head, chest and abdominal circumference are measured	1. Done 2. Not done	
O814	Inform the findings to mother gently and politely	1. Done 2. Not done	
O815	Findings will be recorded on record books	1. Done 2. Not done	
O816	Communicate to responsible bodies, refer if there is abnormalities	1. Done 2. Not done	
	<b>Immunization</b>		
O901	OPV, hepatitis B vaccine IM and BCG intradermal vaccines are provided/ inform to mothers.	1. Done 2. Not done	
O902	Mothers asked and counseled if they worries about immunization.	1. Done 2. Not done	

**APPENDIX IV: Interview guide questions developed to assess quality of newborn care and associated factors for health care providers in JUMC, Jimma, 2018.**

Question #1. To start our discussion please do you mind explaining about yourself? **Probe on:**

*Overall experience you have?*

*Experience working with immediate newborn care in JUMC?*

Question#2. How do you see the general status of work environment in maternity unit in this Hospital? Probe on :

*How do you see the general status of newborn care service in the ward/ unit? elaborate*

*Is there a gap? What are the most problems and gaps do you think to provide quality newborn care services?*

*Do the Health Professionals have a concern? What are the major concerns health workers have regarding neonatal health care service?*

*Is there a guideline, trainings for professionals? Prove with ex? Link, referral system, communication ...*

*How do you see or rate the health status of newborns in this hospital?*

Q#3. Knowledge: How do you see the knowledge status of health care providers towards neonatal care immediately after birth (probe for guideline use? trainings? **Probe:**

*How do you see the efficacy and motivation of you (maternity unit staffs) to provide newborn care services immediately after birth?*

*Do you think that they (U) know the impact and benefits of giving appropriate immediate neonatal health care services?*

*Do you think the staffs in this unit know how to prevent immediate newborn complications and infections?*

*How confident are they (you) while giving immediate newborn care (such as skin to skin contact, cord care, detection of early infections and interventions, neonatal resuscitation, APGAR scoring, etc.)?*

*How do you rate the quality of care being provided by care providers? why, how*

*What makes the health care providers to give quality care? (facilitators)*

*What makes hard for health care providers in this unit to provide quality care?( barriers)*

*Follow up and monitoring mechanism (responsible body to orient, guide, check and supervise the care providers while giving service? Probe on trainings, challenges, gaps.*

*How do you see the decision making powers of care providers in taking immediate action during complications? How, when?*

Q#4.Practice: How do you explain the skill of health care providers in the unit to provide immediate newborn care?

*Do you (they) provide quality care as per the guideline? If yes, how? If no, Why?*

*Do you have any strategies to measure quality of the care in the ward? HOW?*

*Is there any motivation mechanisms for care provides for standardized quality care and timely services for newborns?*

*Do the care providers punished for ill treatment/misconduct? When? How? example*

*What do you think about the care receivers' response on the service they received in the ward/ unit? Complain*

Question #5. **Medical supplies:** How do you see the availability medical equipment, medications and other resources to provide newborn care in

the unit? Probe:

*How do you see the **general environment** of the unit to facilitate INC provision?*

*How do you see the **functionality and readiness** to use materials used to provide ENC?*

*Is there **lack of medical supplies, materials** in the unit? What is lacking, not functioning? Why?*

*What **measures have been taken** to fulfill them?*

*How does lack of supply **impact, affect the quality** of services being provided? example*

*What do the **communities feel/perceive** about the shortages of **medical supplies**? example*

*Is there **complain or appreciation** from **staffs** regarding medical supplies? What, how, why?*

*Do you have **follow up or evaluation or monitoring mechanism** to see the families, mother's **satisfaction** regarding the supplies, infrastructures? Why? How? When? \* **Is there any support/intervention made recently**? From any part*

**Thank you for the participation!**

P. ID	Age	SEX	LEVE OF EDUCATION	YEAR OF EXPERIENCE	POSITION
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					



**Appendix V: Items and findings collected on process dimension (health care providers' knowledge and practice self-report) to assess health care providers' skill on immediate newborn care in JUMC, Jimma, Ethiopia, 2018**

**INC Knowledge attributes of Health care providers**

INC dimensions	Variables	Frequency	Percent
Knowledge of common materials used for providing cord care	Sterile glove	94	94.9
	Sterile Cord clamp	82	82.8
	Sterile Cord tie	83	83.8
	Sterile cord cut	79	79.8
Knowledge on hypothermia prevention means	delivering babies on mothers abdomen	78	78.8
	drying babies properly	82	82.8
	Put in skin to skin contact	69	69.7
	covering the baby's head with hat	73	73.7
	Use of blanket	64	64.6
	Warming the room	72	72.7
	Teaching mothers to keep their baby warm	65	65.7
Knowledge on early exclusive breast feeding	Delaying bath	63	63.6
	advantage of EEBF	82	82.8
	correct breast feeding attachment	83	83.8
	Importance of continuous and demand feeding	54	54.5
	Breast assessment	77	77.8
	Importance of contentious early exclusive breast feeding	89	89.9

## Practice Self-report Attributes Of health care providers

<b>INC dimensions</b>	<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
Birth asphyxia management Practice self-response	Call for help to manage birth asphyxia	78	78.8
	Clamp and cut cord immediately	72	72.2
	Transfer the newborn to firm surface	67	67.7
	Use appropriate size mask	72	72.7
	Inform mother about baby's condition and what was done politely	58	58.6
Eye care practice self-report	Apply TTC eye ointment	93	93.9
	Examine the eye for sign of infection/ Jaundice	68	68.7
	Tell the mother why eye care is given	56	56.6
Preterm/ LBW birth care practice self-response	Weigh the preterm newborn	82	82.8
	Determine gestational age	84	84.8
	Express breast milk to baby mouth when unable to suck	78	78.8
	Check breathing	70	70.7
	Assess the newborn frequently	62	62.6
	provide additional care as needed	65	65.7
Practice self-response on medical procedure provision	Introduce the procedure to mother before doing	72	72.7
	Introduce risk of procedure before providing	63	63.6
	Encourage mother to ask if she worries about procedure	59	59.6
	Respond to mothers question respectfully	56	56.6
Infection prevention practice	Give vaccine to the newborn	15	15.2
	clean newborn eye with sterile gauze	75	75.8

**Appendix VI: Observational checklist collected to assess health care providers' skill on immediate newborn care in JUMC, Jimma, Ethiopia, March, 2018**

**Practice Observations**

	<b>Part I: Background Characteristics</b>		Diploma midwife	BSc Midwife	Residents	Over all
O101	Age in year	25-29	100 (3)	100 (6)	40 (2)	78.6
		30-34	0 (0)	0 (0)	60 (3)	21.4
O102	Sex	Male	0	50 (3)	80 (4)	<b>50</b>
		Female	100 (3)	50 (3)	20 (1)	<b>50</b>
O104	Training on INC		0	16.7	40	24.4
<b>PART II: Skill Observation</b>						
	Preparation					
O201	Instrument prepared before delivery of the baby to give cord care(sterile cord clamp, cut & glove)		66.7%	0	0	14.3%
O202	Wash hands or alcohol hand rub before wearing sterile glove		0	0	0	0
O203	Sterile Glove is worn to give cord care		100	83.3	100	92.9
	Cord care					
O301	Sterile blade or scissor is used to cut cord		66.7	83.3	80	78.6
O302	Sterile cord tie is used to tie the cord		0	50	50	38.5
O303	Cord tied after pulsation stops or 2-3 minutes (observe if checked)		66.7	16.7	40	35.7
O304	Cord is checked for bleeding		100	83.3	100	92.9
O305	Cord covered with clean clothes without applying nothing		100	100	100	100
	Identification					
O401	Call out time of birth and sex of newborn		0	16.7	0	7.1
O402	Identification tag is applied		0	16.7	20	14.3
O403	The baby is weighed		100	66.7	75	76.9
	<b>Thermal protection</b>					
O501	Newborn is placed on mother's abdomen/ chest immediately after birth.		33.3	33.3	60.0	42.9
O502	The baby's body is Wiped or thoroughly dried immediately with towel/ cloth		66.7	83.3	100	85.7
O503	Wet towel is discarded		66.7	50	80	64.3
O504	Cover/wrap baby with dry cloth or towel		66.7	50	80	64.3
O505	Leave baby on mother's chest in skin to skin		0	0	0	0

	contact				
O506	Cover baby's head with a hat	0	0	0	0
O507	Make sure the room is warm	100	83.3	100	92.9
O508	Check the baby's body temperature	0	0	0	0
O509	Teach mother about the signs and prevention method, tell her to delay bathing	0	0	0	0
	<b>Early and exclusive breast feeding</b>				
O601	Brest feeding initiated within 1 hour after birth	100	83.3	40	71.4
O602	The mother is assisted / supported to breast feed the baby early	66.7	66.7	40	57.1
O603	Assess breast condition by expressing colostrum during initiation	33.3	16.7	20	21.4
O604	Encourage the mother feeding the baby continuously on demand.	0	0	20	7.1
O605	Teach good attachment of breast feeding	0	0	20	7.1
O606	Teach the advantage of early and exclusive breast feeding	0	0	0	0
	<b>Initiation of breathing/ resuscitation (3)</b>				
O701	Assess newborn breathing for birth asphyxia while drying or in the first minute after birth	-	-	100	100
O702	Call for help if the baby do not cry, has difficulty of breathing or gasping	-	-	100	100
O703	Clamp and cut the cord quickly	-	-	100	100
O704	Transfer the neonate to warm, flat & firm surface	-	-	100	100
O705	Suction the baby's mouth and nose initially to remove secretion or blockage	-	-	100	100
O706	Cover the baby except head and chest	-	-	66.7	66.7
O707	Extend head slightly for trachea to be opened	-	-	100	100
O708	Use clean and right size mask to cover chin, mouth and nose to achieve sealing	-	-	33.3	33.3
O709	Eyes do not be covered with mask	-	-	66.7	66.7
O710	Ventilation started by squeezing bag attached to the mask with two fingers or whole hand	-	-	66.7	66.7
O711	Observe rise of chest	-	-	66.7	66.7
O712	Ventilate at 40-50 breaths per minute until baby starts crying or breathing	-	-	33.3	33.3
O713	Assess breathing status while ventilating/ resuscitating	-	-	66.7	66.7
O714	Explain to the mother gently that the baby needs assistance to breath	-	-	0	0
O715	Recording the newborn baby's condition	-	-	100	100
	<b>Eye care</b>				
O801	Clean/ wipe eyes with sterile gauze	33.3	16.7	20.0	21.4

O802	Examine eyes for sign of infection/ illness (swelling, redness, pus discharge, jaundice)	33.3	16.7	40.0	28.6
O803	Apply TTC eye ointment 1%	33.3	33.3	60.	42.9
O804	Tell to mother why the eye care is given	0	0	0	0
O805	Record the procedure ,report to responsible body if there is any abnormality	0	0	20	7.1
	<b>Preterm/ LBW babies Care (4)</b>				
O901	The baby is weighed to determine LBW	-	50	100	75
O902	Gestational age determined (confirmed)	-	0	50	25
O903	More warmth and attention given to LBW baby	-	100	100	100
O904	Breathing checked	-	50	100	75
O905	Frequent assessment	-	0	50	25
O906	Express breast milks to baby's mouth if unable to suckle	-	0	0	0
O907	Provide additional care based on the baby's condition	-	50	50	50
O908	Kangaroo baby care if the baby is in good condition	-	0	0	0
	<b>Newborn illness, infection management (0)</b>				
O110 1	Single dose Vitamin K Injection is provided (1 mg IM) <i>to all newborn babies</i>	100	33.3	40	50
O120 1	Newborn is thoroughly examined for abnormalities, dislocations, birth injuries and congenital anomalies.	66.7	66.7	0	42.9
O120 2	Head, chest and abdominal circumference are measured	0	0	0	0
O120 3	Inform the findings to mother gently and politely	0	0	0	0
O120 4	Findings will be recorded on record books	0	16.7	20	14.3
	<b>Immunization</b>				
O130 1	OPV, hepatitis B vaccine IM and BCG intradermal vaccines are provided/ inform to mothers.	0	0	20	7.1
O130 2	Mothers asked and counseled if they worries about immunization.	0	0	0	0

## DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Name of the institution: \_\_\_\_\_

Date of submission: \_\_\_\_\_

This thesis has been submitted for examination with my approval as University advisor

Name and Signature of the first advisor \_\_\_\_\_

\_\_\_\_\_

Name and Signature of the second advisor \_\_\_\_\_

\_\_\_\_\_