

# Immediate Newborn Care Practice and Associated Factors Among Newborns Delivered at Public Health Facilities of Debre Markos Town, North West Ethiopia

**Firehiwot Fantahun**

Wollega University

**Gurmesa Tura** (✉ [gurmesatura@gmail.com](mailto:gurmesatura@gmail.com))

Jimma University

**Abebe Habtamu**

Debre Markos University

**Rut Oljira**

Wollega University

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## Research Article

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# Abstract

**Background:** About 47% of under-five deaths occurred in the first month of life. Even though under-five mortality declines globally, death is more concentrated in the first days of life. This provides a clue to focus more on immediate newborn care than ever before. Therefore, this study aimed to assess level of immediate newborn care practice and associated factors among newborns delivered at public health facilities in Debre Markos Town, North West Ethiopia from March 28 to May 27, 2020.

**Methods:** Facility based cross sectional study with quantitative and qualitative methods were used. For the quantitative study a total of 286 mothers with their newborns were included. For the qualitative study 10 key-informants were interviewed. Pre-tested, semi-structured questionnaires and observational checklists were used for the data collection. Collected data were entered into Epi-data version 3.1, and exported to SPSS version 22 for analysis. Binary and multivariable logistic regression were done. Independent variables with a P-value of  $\leq 0.25$  in bivariable analysis were considered as candidate for multivariable analysis. P-value  $< 0.05$  was used as cut off point for presence of statistical significance in the multi-variable model. Goodness of fit test was checked using Hosmer and Lemeshow test.

**Results:** The level of immediate newborn care practice was 76.9% [(95% CI = (72.0-82.0)]. History of ANC follow up (AOR=3.36;95%CI:1.50,7.53), mother's knowledge on immediate newborn care (AOR=5.29;95%:2.00,14.00), birth-preparedness of the mother (AOR=7.80;95%:3.36,18.06) and availability of drugs, equipment and materials (AOR=6.79;95%CI:3.05,15.12) were found to be independent predictors of the level of immediate newborn care practices.

**Conclusion:** In this study, the level of immediate newborn care practices among newborn neonates was found to be unsatisfactory compared to the national target. So it is important to promote immediate newborn care through adequate supply of essential drugs and equipment, counseling and education on immediate newborn care, promotion of birth preparedness activity and strengthen ANC service for all pregnant women.

## Background

The call under the Sustainable Development Goals (SDGs) and Every Newborn Action Plan (ENAP) to reduce the global neonatal mortality rate (NMR) to 12 or less per 1000 live births and by 2030 has led to widespread attention on increasing focus of life-saving interventions for newborn babies around the time of birth(1, 2). Essential Newborn Care (ENC) is a care that every newborn baby needs regardless of size and place of birth to optimize their survival within the first month of life(3, 4).

Immediate newborn care interventions are part of ENC which protects newborn morbidity and mortality that happened immediately after birth within the first hour. It includes clean cord care, thermal care, and initiation of breastfeeding within the first one hour of birth, management of immediate asphyxia, and management of early sepsis(5).

Globally in 2018, about 47% of under-five deaths occurred in the first month of life. Even though under-five mortality declines globally, death is more concentrated in the first days of life. This makes focus on immediate newborn care more critical than ever before. In 2018, an estimated 2.5 million children died in their first month of life, which is approximately 7,000 newborns every day with about one-third dying on the first day of life. A NMR is decline globally from 37 to 18 deaths per 1,000 live births in 1990 to 2018. However, this decline of 51% is slower than the rate of decline among children under 5 (63%). As a result, the share of neonatal deaths among all under-five deaths increased from 40 percent in 1990 to 47 percent in 2018(2, 6–8).

Sub-Saharan Africa (SSA) region had the highest NMR among all regions of the world in 2018 with 28 deaths per 1,000 live births, followed by the Central and Southern Asia region with 25 deaths per 1,000 live births. This indicates that a child born in SSA or in Southern Asia is 10 times more likely to die in the first month than a child born in a high-income country (9, 10).

In Ethiopia, NMR accounts for 41% of under-five deaths(11). According to the mini Ethiopian Demographic and Health Survey (EDHS) 2019, neonatal death showed a minimal increment from 29 per 1,000 live birth in 2016 to 30 per 1,000 live births in 2019 (12). This clearly indicated that in Ethiopia 1 in every 35 children dies within the first month of life. There was a reduction of NMR from 49 deaths in 2000 to 29 deaths per 1,000 births in 2016(41%) over the last sixteen years in the country. On the contrary, there was also a significant variation among regions on neonatal mortality. For instance, neonatal mortality in Addis Ababa was 18/1000 live births, whereas in Amhara region it was 47/1000 live births. This might indicate that the risk factors responsible for neonatal death varied from place to place which needs a local data to address the problem. Amhara regional state which is the study area is the first top region by neonatal mortality in Ethiopia(13).

Every Newborn Action Plan (ENAP) emphasizes giving focus on the time around birth with targeted high-impact interventions for reducing not only newborn deaths but also maternal deaths and stillbirths which triple return in investment. Around 3 million newborns and women could be saved each year through investing in care around the time of birth(14).

World Health Organization (WHO) is working with the Ethiopian ministry of health and partners to strengthen and invest in care, particularly around the time of birth and the first week of life. Since most newborns are dying in this time period. To improve the maternal and newborn care practices from pregnancy to the entire postnatal period, different capacity building training was given for midwives, including neonatal nursing, reduce inequities in accordance with the principles of universal health coverage, promote engagement and empower mothers, families, and communities to participate(15).

However, accelerated progress for neonatal survival and promotion of health and well-being still requires further strengthening of the care around the time of birth and ensuring availability of improved health services since newborn death account for an increasing share of under-five deaths, and they are declining at a slower rate than child deaths overall and despite the high concern of the government on immediate newborn care, it is a neglected issue at health facilities due to different reasons(16).

Most studies in Ethiopia are conducted in immediate newborn care particularly focusing on health professional perspective and limited studies have been conducted in Ethiopia on immediate newborn care by considering factors that affect it other than health professional related variables(4, 17–19). Therefore, this study aimed to fill the above gap by assessing the magnitude and factors associated with the level of immediate newborn care by adding maternal factors that are not addressed in the previous study. In addition, the study tried to assess the perspective of health facilities, service providers, and mothers in relation to the care provided. Therefore, this research was tried to assess the level and identify associated factors of immediate newborn care practice in Debre Markos Town, North West Ethiopia.

## Methods

The study was conducted in Debre Markos Town, North West Ethiopia from March 28 to May 27, 2020. Debre Markos is located 300 km far from the capital city of Ethiopia, Addis Ababa in South-Eastern direction. According to the Town finance and economic office 2017/18 report, the total population of the Town is 101,582 (Male = 49,775, Female 52,806). Regarding with public health institution, there are 1 public hospital and 4 health centers providing immediate newborn care services in the Town. The average annual delivery in all public health facilities of the Town is 3780.

A facility-based cross-sectional study design with a quantitative method supplemented by a qualitative method was used.

All newborn neonates at public health facilities of Debre Markos Town were included in the study as source population. For quantitative study selected immediate postnatal women and their newborn neonates at public health facilities of Debre Markos Town during the study period who fulfill the inclusion criteria were the study population. For qualitative study purposively selected facility heads, delivery ward team leaders, and skilled birth attendants in the delivery room at public health facilities of Debre Markos Town were included as the study population.

All newborn and all immediate postnatal mothers were included in the study and Newborn with congenital anomalies, newborns with dead mothers, mothers with dead newborns, and critically and mentally ill mothers, were excluded from the study.

For the quantitative, study the sample size was determined by a single population proportion formula by assuming the 76% as a proportion of newborn who get the good practice of immediate newborn care from the previous study, 95% confidence level (CI), 5% margin of error, and the sample size was 280.

From preliminary assessment the source population (annual number of delivery in all public health facilities in the Town was 3780) therefore it was less than 10,000 and  $n/N$  was greater than 5% correction formula was used to adjust the sample size.  $n = n / (1 + n/N) = 280 / (1 + 280/3780) = 260$ . By adding a 10% non-response rate the final sample size was 286.

For the qualitative, study ten in-depth interviews were conducted with purposively selected key informants (two from each health facility). They were head of health facilities, the delivery ward team leaders, and skill birth attendants in delivery room. Since there was information saturation and repetition of ideas only 10 in-depth interviews were conducted

The study was included all public health facilities in the Town purposely. (1 public hospital and 4 health centers) the sample size was distributed to each facility by using population proportional allocation. After the sample size was proportionally allocated to each facility based on their annual delivery then by consecutive sampling method all mothers with their newborn who gave birth in selected facilities during the study period were included in the study until the sample size was achieved.

For qualitative study, Purposive sampling technique was used to select key informants.

In this study, the outcome variable, immediate newborn care practice is defined as care given for newborn babies from birth up to 1 hour of birth. The level of immediate newborn care practice is assessed by using 13 indicators and then the composite score was computed. Independent variables were socio-demographic characteristics of the mother (age, education, residence, marital status, income, knowledge on components of immediate newborn care), obstetric history of the mother (Parity, history of ANC, birth preparedness, and mode of delivery), health system-related variables (Availability of drugs and materials, Health professional related variables (Competency of health professional on their work, Training of health professional on immediate newborn care and challenges of health professionals to give appropriate immediate newborn care)

Data were collected using an interviewer-administered, pre-tested semi-structured questionnaire which was adapted from different literature. Besides, a medical record review was made using observational checklists. All deliveries during day and night time were observed by data collectors.

Five trained public health officers from the nearby district health facilities were collected the data, two supervisors who are holders of degree in Public Health (PH), and the research teams including the principal investigator were supervised the overall process of data collection. The tool was first in English and then translated to Amharic, the local language of the study area. Then it is back-translated to English to keep the consistency of the tool. A pre-test was conducted in 5% of the sample population in nearby Town health facilities prior to the actual data collection.

For qualitative data collection interview guide was developed after reviewing different literatures and data were collected using in-depth interviews (IDI) with facility heads, the delivery ward team leaders, and skilled birth attendants in delivery room. In-depth interview was made by three experienced data collectors in qualitative research (MPH in health education) from Debre Markos University. The interview was done with one moderator, one note taker and one recorder.

Collected data were coded, entered, and cleaned by Epi-data version 3.1, and then it was exported to SPSS version 22 for analysis. Descriptive, binary, and multivariable analysis was done. All variables that

show significant association during the Bivariable analyses at p-value <0.25 were entered to multivariable logistic regression-value < 0.05 was used as a cutoff point to declare statistical significance. The backward logistic regression method was used in multiple regression to identify independent predictors of the outcome variable. Adjusted OR with its corresponding 95% CI was used to know the strength and direction of the association. Multicollinearity is checked for independent variables by using variance inflation factor (VIF). Model fitness was assessed by Hosmer and Lemeshow model fitness test (p-value 0.849).

On the other hand, qualitative data were transcribed, checked, and re-checked by data collectors. Then, line by line coding system was conducted manually by PI. Finally, thematic analysis was used to analyze the data.

Ethical clearance was obtained from Jimma University ethical review board. The permission letter was written from Debre Markos Town health department. Written informed consent was obtained from each key informant and verbal consent from each mother to follow the care provided to their baby and to interview them. The confidentiality of the study participants was maintained at each level of the response. A Personal identifier was not used in the questionnaire to assure privacy. Termination of participation from the study at any time during the study was possible.

## **Result**

A total of 286 newborns and mothers were included in the quantitative study with response rate of 100%. For the qualitative study 10 key informants were participated.

## **Socio-demographic characteristics**

The mean ( $\pm$ SD) ages of mothers were 27.59( $\pm$ 5.31) years. Regarding with educational status, 102(35.7%) of the mother have not formal education. The majority of mothers 241(84.3%) were married. Among mothers included in study 175(61.2%) were urban residents. From the total of 286 newborns observed the nearly half (53.1%) were females. (Table 1)

Table 1

Socio-demographic characteristics of immediate postnatal mothers and newborn in public health facilities of Debre Markos Town, Northwest Ethiopia, 2020.

Variables	Category(N=286)	Frequency(N)	Percent (%)
Age of respondent	15-19	7	2.4
	20-24	83	29
	25-29	100	35
	30-34	54	18.9
	35-39	38	13.3
	40-44	4	1.4
Educational status of mothers	Not formal education*	102	35.7
	Formal education**	184	64.3
Marital status of mother	Unmarried ***	45	15.7
	Married	241	84.3
Residence	Urban	175	61.2
	Rural	111	38.8
Average family income	<1200	69	24.1
	1200-1800	78	27.3
	1801-3200	71	24.8
	3201-8000	60	21
	>8000	8	2.8
Sex of newborn	Male	134	46.9
	Female	152	53.1
*Unable to read and write & Read and write **Primary, Secondary, Collage and above. ***never married, divorced, and widowed.			

## Health service and obstetric related characteristics of immediate postnatal mothers

About greater than half of the mothers, 177 (61.9%) were multiparous. With regard to birth preparedness, 189(66.1%) of mothers are prepared for birth by making birth preparedness activities like preparing essential items (clean cloth, funds for birth-related and emergency expenses) for clean and safe delivery before delivery. Concerning history ANC, 184(64.3%) of mothers had attended antenatal clinics at least once during their pregnancy period.

Concerning consultation of immediate new born care during ANC visit, from all mothers that had a history of ANC about 120(62.2%) of mothers were not counsel about immediate newborn care. With regard to consultation of immediate newborn care during delivery only 87(30.4%) of mothers are counseled about immediate newborn care. From all mothers about less than half of mothers 139(48.6%) had knowledge on the components of immediate newborn care. (Table 2)

Table 2

Health service and obstetric related characteristics of immediate postnatal mothers in public health facilities of Debre Markos Town, Northwest Ethiopia, 2020

Variables	Category(N=286)	Frequency(N)	Percent (%)
Parity	Primiparous	109	38.1
	Multiparous	177	61.9
Birth preparedness	Prepared	189	66.1
	Not prepared	97	33.9
History of ANC visit	Yes	184	64.3
	No	102	35.7
Number of ANC visits (N=184)	One ANC visit	121	68.8
	Two ANC visit	40	21.7
	>= 3 ANC visit	23	12.5
Knowledge on ENC	Good	139	48.6
	Poor	147	51.4
Counseled on ENC during ANC visits (N=184)	Yes	64	37
	No	120	62.2
Counseled on ENC during delivery	Yes	83	29.0
	No	203	71.0
Mode of delivery	CS	97	33.9
	SVD	189	66.1

ANC: Antenatal care, ENC: Essential newborn care, CS: cesarean section, SVD: spontaneous vaginal delivery

## Availability of drugs, materials, and supply

Among total newborns observed, 202 (70.6%) newborns were received immediate newborn care with a good supply of drugs, materials, and medical equipment while 84 (29.4%) of newborns were received

immediate newborn care with a poor supply of drugs, materials, and medical equipment. Among all essential drugs assessed the availability and use of essential drugs for each newborn range from vitamin K (95%) to TTC eye ointment (76%). with regard to essential medical equipment, and materials availability and use for each newborn range from newborn resuscitation material (58%) to syringes and needles (92%). (Figure 1)

## **Newborns care service provision by health workers**

Ten in-depth interviews were conducted on the competency of health professionals on their work, training of health professionals on immediate newborn care practice, and challenges of health professionals to give appropriate immediate newborn care practice.

### **Theme one –Competency of health professionals on their work**

The competency of health professionals includes their knowledge of immediate newborn care, skill in different components and procedures of immediate newborn care, and work experience in the area. As mentioned by health facility heads and health professionals there is no knowledge gap on immediate newborn care but still, there is a huge gap in skill to do different cares and procedures which affect the level of immediate newborn care practice.

“Most of the midwives are new here since there is turn over so there is a skill gap on professionals. There are health professionals that directly come from college and university especially in newborn resuscitation part there is huge skill gap .....To alleviate this skill gap problem there are senior staffs as well as there are also fresh midwives and they communicate each other and share experience.....” (A 31 years old Male delivery ward team)

### **Theme Two –Training of health professionals on immediate newborn care**

According to health professionals idea in all facilities, there is no regular training given in all health facilities on immediate newborn care practice and as they stated it is important to give on-site and regular training in immediate newborn care since lack of training on immediate newborn care affect quality and effectiveness of care provision.

*“.....There is no any onsite or formal training for health professionals on immediate newborn care...”*  
(A 31 years old Male delivery ward team leader)

#### **5.4.3 Theme Three – challenges of health professionals to give appropriate immediate new born care.**

The major problems mentioned by health professionals were lack of adequate drugs, materials, and medical equipment to give and high client overflow especially in a referral hospitals.

“.....Ehhhhh as you know in immediate newborn care the basic problem is infrastructure, for example, one of the care is putting newborns on a radiate warmer so in thermal care there is a problem since we have one radiate warmer.....”(A 31 years old Male delivery ward team leader)

“.....In our health center major problem that challenges health professionals is lack of supply of drugs. Most of the time drugs that are essential for newborn care are misplaced in inappropriate places and temperatures and they become expired.....” (A 35 years old female diploma midwife)

## **Level of immediate newborn care practices**

The level of immediate newborn care practice is assessed by using 13 indicators and then the composite score was computed. After assessing the above 13 indicators by observational checklist during delivery then the composite score for level of immediate newborn care practice is computed hence, from the total of 286 newborns observed in the checklist, 220 (76.9%) with 95% CI of 72%-82% newborns were received a good level of immediate newborn care practice while the remaining 66 (23.1%) of newborns received a poor level of immediate newborn care practice. (Figure 2)

## **Factors associated with good practice of immediate newborn care**

Bi variable logistic regression analysis was conducted to identify the candidate variable for the multivariable logistic regression analysis. Hence in bi-variable analysis, a total of 7 variables shows association with good practice of newborn care at p-value 0.25 and nominated for further analysis and entered the final model. As it can be indicated in the result of the bivariate logistic regression analysis educational status of the mother, residency, birth preparedness, history of ANC visits, advice of ENC during delivery, maternal knowledge on the components of newborn care and availability of drug, equipment, and materials were showed association with good practice of immediate newborn care. Hosmer and Lemeshow's goodness of fit test at p value greater than 0.05 was used for the model fitness test.

In multivariable logistic regression analysis four predictor variables, history of antenatal care (AOR=4.19;95%CI:1.78,9.86), mother's knowledge on immediate newborn care (AOR=4.83;95%CI:1.82,12.8), birth-preparedness(AOR=7.17;95%CI:3.04,16.9) and availability of supply, drugs, equipment, and materials AOR=6.71;95%CI:2.95,15.2) were found to be independent predictors of the good practice immediate newborn care at a p-value of 0.05.

The odds mother that has antenatal care follow-up during their pregnancy period were 3 times more likely to receive a good practice of immediate newborn care for their newborn neonate as compared with mother had not antenatal care follow-up during their pregnancy period. The odds the mother with good knowledge on essential newborn care component were 5 times more likely to receive a good practice of immediate newborn care for their newborn neonates as compared with mother that had a poor knowledge on the components of essential newborn care. The odds mothers that had birth preparedness

were 7.8 times more likely to receive good practice of immediate newborn care for their newborn neonate as compared with mothers that had not birth preparedness activity. The odds of newborns received care with a good supply of drugs, equipment and materials were 6.7 times more likely to receive a good practice of immediate newborn care than those newborns cared with a poor supply of drugs, equipment, and materials. (Table 3)

Table 3

Bivariable and multivariable analysis result of factors associated with good practice of immediate newborn care in public health facilities in Debre Markos Town, Northwest Ethiopia, 2020.

Variables	Immediate newborn care practice		COR (95% CI)	AOR (95% CI)	P-value
	Poor	Good			
Residency					
Urban	31(17.7%)	144(82.3%)	2.13(1.22-3.73)	1.12(0.49-2.51)	0.782
Rural	35(31.5%)	76(68.5%)	1		
Educational status					
Formal	31(16.8%)	153(83.2%)	2.57(1.46-1.47)	1.70(0.77-3.73)	0.184
Not formal	35(34.3%)	67(65.7%)	1		
Counsel on ENC					
Yes	6(7.2%)	77(92.8%)	5.38(2.22-13.03)	3.09(0.97-9.81)	0.055
No	60(29.6%)	143(70.4%)	1		
History of ANC					
Yes	16(8.7%)	168(91.3%)	10.09(5.30-19.2)	3.36(1.50-7.53)	0.003
No	50(49%)	52(51%)	1		
knowledge on ENC					
Good	8(5.8%)	131(94.2%)	10.67(4.85-23.4)	5.29(2.00-14.00)	0.001
Poor	58(39.5%)	89(60.5%)	1		
Birth preparedness					
Prepared	15(7.9%)	174(92.1%)	12.86(6.64-24.9)	7.80(3.36-18.06)	0.000
Not prepared	51(52.6%)	46(47.4%)	1		
Availability of drug, equipment and materials					
Poor	45(53.6%)	39(46.4%)	1		
Good	21(10.4%)	181(89.6%)	9.94(5.33-18.5)	6.79(3.05-15.12)	0.000
AOR: Adjusted Odd Ratio, COR: Crude Odd Ratio, 1=reference, CI: Confidence Interval, ANC: Antenatal care, ENC: Essential newborn care, CS: cesarean section, SVD: spontaneous vaginal delivery					

## Discussion

In this study, the majority of newborns 220 (76.9%) received good practice of immediate newborn care which is in line with the study done in Sub-Saharan African countries(80%)(20), Wolayta zone public hospitals, South Ethiopia (75.8%)(5) and the study done in Northern Ethiopia (17). These similarities may be due to the study in Sub-Saharan African countries use a similar study population and study design, the study done in the Wolayta zone use a similar standard tool and study population and the Northern Ethiopia study have similar Scio-demographic and cultural characteristics of the study population with the current study. But it is higher than the study done in the upper Himalayas (47.8%)(21), Ghana (33%)(22), Bahir Dar, North Ethiopia (55.7%)(19), and Addis Ababa Ethiopia (30%)(23). This may be due the study in the upper Himalayas due to the difference in Scio-demographic, health service, and cultural differences of the study population, the study in Ghana used surveillance data, the study in Bahir Dar is only focus on the provider perspective of newborn care while the study in Addis Ababa is more concentrated on maternal basic emergency obstetric and newborn care and assessed only three components of immediate newborn care.

According to this study, 70.6% of newborns were received immediate newborn care with a good supply of drugs, materials, and medical equipment. This finding is in line with a study done in Amhara regional state health facilities, Ethiopia (73.1%) (24), and almost comparable with a study done in Wolayta zone, South Ethiopia (80.6%)(5). But higher than a cross-sectional observational study done in sub-Saharan African countries (30.8%)(20). This dissimilarity might be due to the later study is done at the country level.

This study revealed that history ANC flow up, maternal knowledge on components of immediate newborn care, birth preparedness of the mother, and availability of supply of drugs, material, and equipment are significantly associated with good practice of immediate newborn care.

Hence the odds of mother that has antenatal care follow-up during their pregnancy period were 3 times more likely to receive good practice of immediate newborn care for their newborn neonate as compared with their counterparts. Which is supported by the study done in Brazil which indicated that there is a relationship between adequate antenatal care and immediate newborn care practice in which newborns that had mothers with inadequate antenatal care was 1.17 times less likely to get a good practice of immediate newborn care(25), another systematic review and meta-analysis done in sub-Saharan African countries which indicate that utilization of at least one antenatal care visit by a skilled provider during pregnancy increase the good practice of newborn care and reduces the risk of neonatal mortality by 39% (11), it also in line with another study done in Bahir Dar City Administration, North West Ethiopia which indicate those newborn who had mothers received ANC service and not received ANC service were 24.7% and 9.6% had good practice of essential newborn care respectively(26).

This study also revealed that the odds of mother that had good knowledge on essential newborn care component were 5 times more likely to receive a good practice of immediate newborn care for their newborn neonate as compared with mother had poor knowledge on the components of essential newborn care. This finding is consistent with the study done in Wolayta zone southern Ethiopia in which

newborns who had mothers with a lack of knowledge on essential newborn care component was 2.7 times less likely to receive a good practice of immediate newborn care as compared with their counterparts(5) and another study done in Southern Ethiopia in which newborn who had a mother with lack of knowledge on essential newborn care component were 0.2 times less likely to receive a good practice of immediate newborn care as compared with their counterparts(27). But it contrasted with a qualitative evidence synthesis done in low- and middle-income countries which revealed that there is no relationship between maternal factors and immediate newborn care (28). This difference is may be due to the difference in study design and study population.

The result of the study indicates the odds of mothers that had birth preparedness were 7.8 times more likely to receive a good practice of immediate newborn care for their newborn neonate as compared with newborns whose mothers had not birth preparedness activity. This finding is supported by Amaro Woreda, Southern Ethiopia, in which those newborn who had mother that had birth preparedness were 3.5 times more likely to receive a good practice of immediate newborn care as compared with newborns whose mother had not birth preparedness activity (27).

Newborns who received care with a good supply of drugs, equipment and materials were 6.7 times more likely to receive good practice of immediate newborn care than those newborns cared with poor supply of drugs, equipment, and materials. and another study done in Wolayta zone in which the odds of newborn received care with poor supply in drugs, equipment and materials were 1.8 times less likely to receive a good practice of immediate newborn care than those newborns cared with good supply of drugs, equipment and materials(5).

## Conclusion

Majority of newborns received good practice of immediate newborn care but still, there is a gap to reach the national set target which is 95% of newborns should receive newborn care components in 2020. In this study, having ANC follow up, birth preparedness of the mother, maternal knowledge on the components of ENC, skill gap of professionals, lack of training for health professionals, and receiving care with good supply of drugs, and materials needed for care were predictors of a good practice of newborn care. So, it is important to promote immediate newborn care through an adequate supply of essential drugs and equipment, counseling and education on immediate newborn care, promotion of birth preparedness activity, and strengthen ANC service for all pregnant women.

## Abbreviations

ANC

Ante-Natal Care

OR

Adjusted Odds Ratio

BCG

Bacilli Chalmette Guerin  
BSC  
Bachelor of Science  
CI  
Confidence Interval  
EDHS  
Ethiopian Demographic and Health Survey  
EMDHS  
Ethiopian Mini Demographic and Health Survey  
ENAP  
Every Newborn Action Plan  
ENC  
Essential Newborn Care  
HC  
Health Center  
HIV  
Human Immunodeficiency Virus  
IDI  
In-Depth Interview  
LBW  
Low Birth Weight  
MPH  
Master of Public Health  
NGO  
Non-Governmental Organization  
NMR  
Neonatal Mortality Rate  
OPV  
Oral Polio Vaccine  
PH  
Public Health  
PI  
Principal Investigator  
SBA  
Skilled Birth Attendant  
SDG  
Sustainable Development Goals  
SPSS  
Statistical Package for Social Sciences  
VIF

Variance Inflation Factor  
WHO  
World Health Organization

## **Declarations**

### **Ethics approval and consent to participant**

A local ethics committee ruled that no formal ethics approval was required in this particular case.

### **Accordance**

All methods were performed in accordance with the relevant guidelines and regulations.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The datasets generated and analyzed during the current study are available in the supplementary file

### **Conflict of Interest**

All the authors declare that they have no any competing interests, be it financial or non-financial.

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### **Authors Contribution**

**Conception and design of the study:** FF, GT, AH, and RO

**Acquisition of data:** FF, GT, and AH

**Data analysis and interpretation:** FF, GT, AH, and RO

**Funding acquisition:** FF, GT, and AH

**Drafting and revising of the manuscript:** FF, GT, AH, and RO

**Final approval for submission:** FF, GT, AH, and RO

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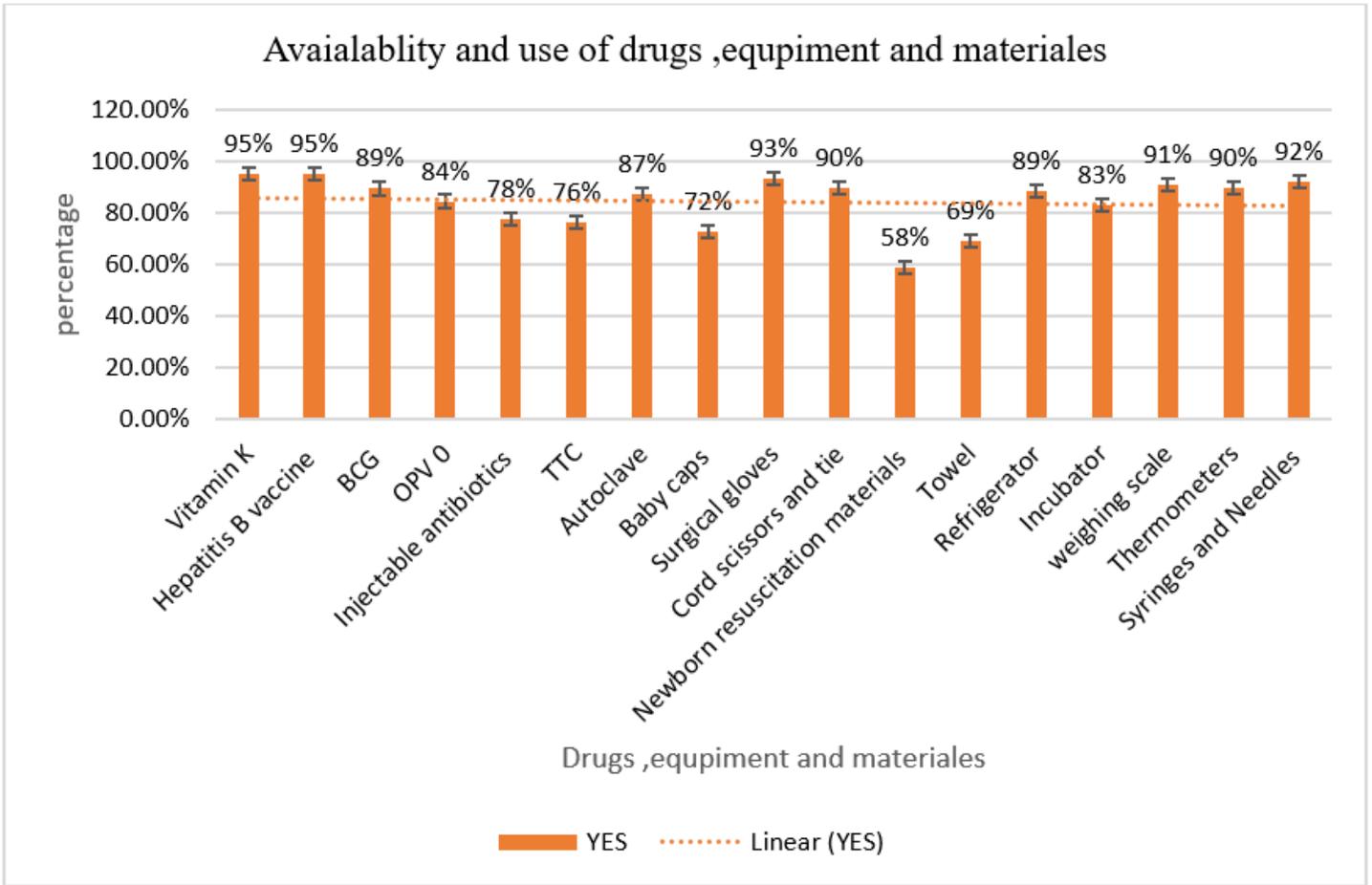
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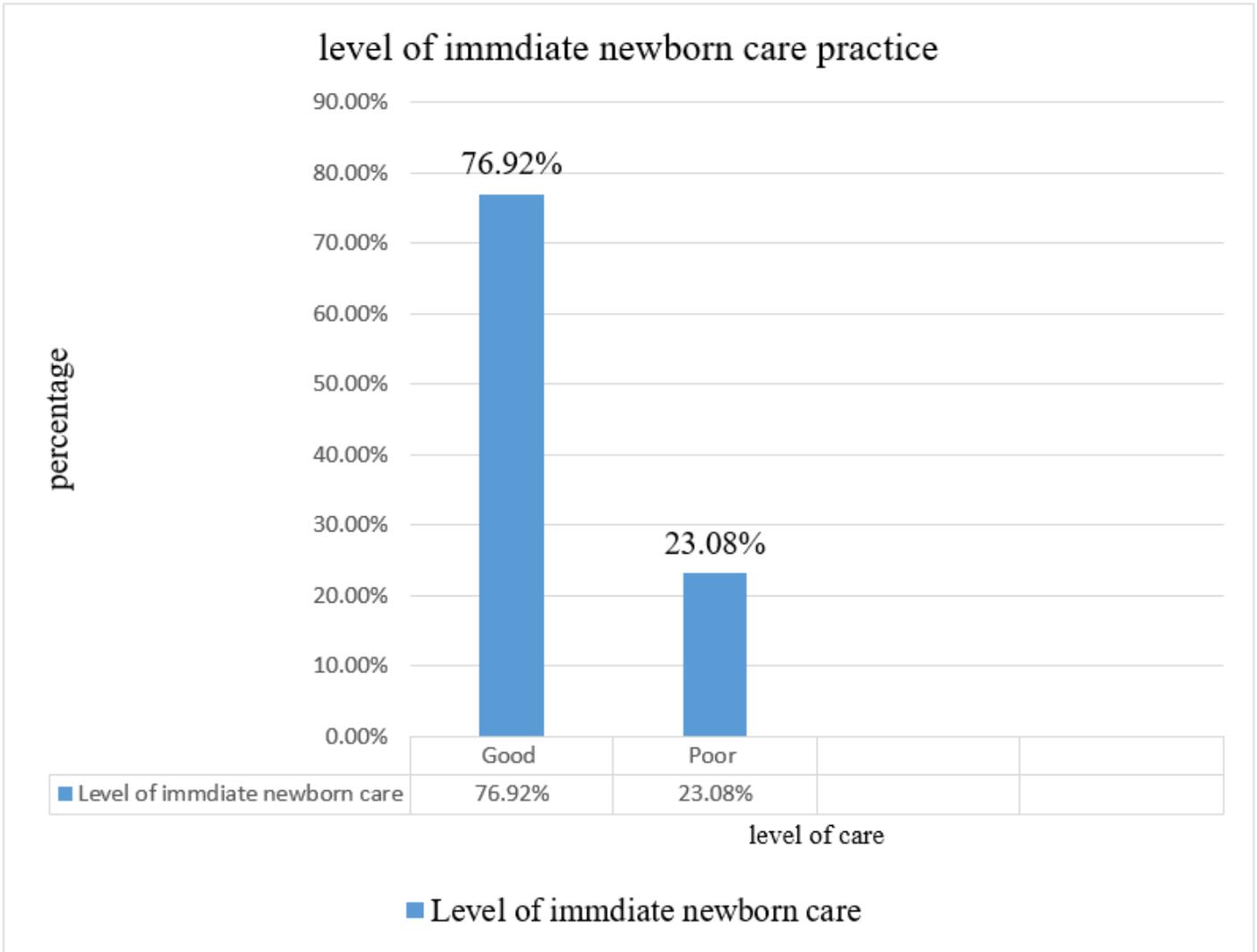
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# Figures



**Figure 1**

Availability and use of drugs, equipment and materials at public health facility of Debre Markos Town, North West Ethiopia.



**Figure 2**

Level of immediate newborn care practice in public health facilities of Debre Markos Town, North West Ethiopia, 2020

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Rawdata.xlsx](#)
- [Questionairyfile.pdf](#)