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RESEARCH ARTICLE

Essential newborn care practice and associated factors among Health professionals at rural Gedeo Zone, southern Ethiopia: Cross sectional study

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Abstract

Background: The neonatal mortality accounts 43% of child death below 5 year in the globe, and 42% in Ethiopia. There is limited evidence regarding the new born care practice of health professionals in rural Gedeo zone of southern Ethiopia. The aim of this study was to assess the essential newborn care practice and associated factors among health professionals at rural Gedeo zone.

Methods: A facility based cross-sectional study design was employed. A total of 233 health professionals (using systematic random selection method) were participated. The EPI-INFO-Version 3.5 and statistical package for social sciences (SPSS) version 20 software was used for data entry and analysis respectively. Significant association was declared by P-value of < 0.05 with a corresponding 95% confidence interval.

Result: A total of 233 health professionals participated with 100% response rate. Among 233 health professionals, 24% had good essential newborn care practice at 95% CI (19.3, 28.9) and above half, 76.0%, of the health professionals missed one or more steps of essential newborn care practices. Older age [adjusted odds ratio (AOR) = 0.18; 95% CI (0.03, 1.12)], female sex [$AOR = 3.08$; 95% CI (1.07, 8.81)], supportive supervision [$AOR = 2.17$; 95% CI (1.12, 4.19)], taking in-service training [$AOR = 4.85$; 95% CI (2.33, 10.10)], and knowing complication of the newborn [$AOR = 1.98$; 95% CI (1.01, 3.89)] were significantly associated with essential newborn care practice.

Conclusion: More than three-fourth of health professionals missed at least one procedure of essential newborn care practice. The finding recommended that the need to strengthen supportive supervision, in-service training, and improve knowledge on complication of newborn to improve essential newborn care of the health professionals at rural health facilities in Gedeo Zone.

Keywords: Ethiopia, Health Professionals, Neonates, Newborn care Practice

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Background

Globally, newborn mortality accounts 45% of less than 5 year old child deaths and account for 40% of under 5year old child deaths in Tanzania, 42% of less than 5 year old child deaths in Ethiopia [1]. Seventy five percent of all neonatal mortality (deaths in the first 28 days of life) occurs in twelve countries, six of them are in sub-Saharan Africa including Ethiopia [2,3].

Birth of newborn is the main challenge to the newborn to transfer positively from intra-uterine to extra-uterine life [4]. Newborn birth and the first few hours of life are serious periods for the advance growth and development of a newborn [5,6]. Amongst the lifespan of the infantile period, newborn period (age of newborn between 1 and 28 weeks) is very crucial as it defines the whole well-being of the child and his/her feature mature life of adult [7]. Utmost newborns are born healthy and at term (gestational age greater than 37 weeks), but the essential newborn care (ENC) they obtain in the first 60 minutes, days, and weeks of existence can define their future health status [8].

Essential new born care practice is an all-inclusive approach planned to improve the health status of new born through interventions before pregnancy, at pregnancy, on and shortly after natal and in the post-delivery period. Essential newborn care protects the newborn against mortality and morbidity which comprises quick commencement and exclusive breastfeeding, warm air care (comprising early drying and jacket at birth, increasing skin-to-skin contact, hindered washing, preserving "warm chain") and cleanliness practices (comprising cord-care and health professionals hand washing) [9,10].

Neonatal mortality is concentrated at less developed countries due to high maternal mortality, and poor essential newborn care [11,12]. In the sub-Saharan Africa countries, maternal death is the uppermost in the glob (56%) and viewing the least advancement among the regions' maternal and new born health for over two decades [13].

The infant and neonatal mortalities rate in Ethiopia was 48/1,000 live births and 29% based on a report of the 2016 Ethiopian Demographic Health Survey (EDHS) respectively [14], Whereas the report of 2019 mini Ethiopian demographic health survey (MEDHS) showed that the current neonatal mortality of Ethiopia increased from twenty nine to thirty percent per 1,000 live births [14].

The major cause of newborn death (less than 28 days) is neonatal asphyxia and birth trauma, which accounts 34%, prematurity 25%, sepsis and other infectious conditions 18%, congenital anomalies 10%, pneumonia 6%, other conditions 4%, tetanus 2%, diarrheal diseases 1%, injuries 1% [1]. In Ethiopia, the primary causes of newborn death (less than 28 days) are neonatal asphyxia and birth trauma, which accounts 34% and becomes higher in rural areas [3]. These conditions could be prevented through quality care (good essential newborn care practice) provided by health care professionals [2,3].

However, in Ethiopia still there is a huge gap in the implementation of essential newborn care practice, studies in different areas revealed that 48.9% and 27.23% of health professionals working in health centers had poor newborn care practice, and educational status, training status, the number of training, national guideline availability, presence of sufficient equipment, health facility type and knowledge level are some of the factors associated with ENCP [11,12]. These studies were conducted at urban areas of Ethiopia. Despite its crucial needs, limited evidence is available regarding ENCP of health professionals at rural Gedeo zone. Therefore, the main objective of this study was to assess the ENCP and associated factors among health professionals working in rural health institutions.

Methods and Materials

Study Design, Period, and Area

A health facility based cross sectional study was employed starting from February 10th - April 30^{th} 2017. It was conducted at Gedeo zone rural districts. Gedeo zone is one of the fourteen Zones in the Southern Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia. The two Dilla and Yirgachefe towns are the administrative centers and the former is the Zonal administrative town.

Dilla town is situated at three hundred sixty kilo meters South East from Addis Ababa (the capital city of Ethiopia). According to the Zonal health department, there are six (Bule, Gedeb, Wonago, Kochere, Yirgachefe, and Dilla Zuria) Woredas. Gedeo Zone has one referral hospital, three primary hospitals and thirty two health centers in which ENCP is implemented. Within the four selected districts of the Zone, there are 477 health workers (63 health officers, 13 BSc nurses, 4 Bsc midwives, 68 diploma midwives, and 329 clinical nurses).

Sample Size Determination and Sampling Technique

The researchers used single population proportion formula by considering the assumptions made for sample size calculation i.e. a 95% confidence interval (CI), 5% margin of error and essential newborn care practice (52.4%) based on a study done in Tigray(13). And the results become 382. Since the source of population is below 10,000 (*i.e.* N=477), the researchers used correction formula, the sample were 212. The sample size for the second objective (factors associated with ENCP) was also calculated; and the maximum sample size obtained from the correction formula was taken. By taking a ten percent of non-response rate, the final sample size became 233.

First, from a total of six districts, four districts (Bulie, Wonago, Yirgachefe and Dilla Zuriya) were randomly selected. Within the four randomly selected districts, there were about 23 health facilities (consisting of 477 health professionals) in which essential newborn care practice was implemented. Then, the final sample size (*i.e.* 233) was allocated based on the number of health professionals to the 23 health facilities proportionally. After proportional allocation of samples, random sampling technique (*i.e.* systematic random sampling) was used in order to identify study participants from each health center using skipping interval (K). The skipping interval (K) was obtained by dividing the total numbers of study participants available at the health center to the number of proportionally allocated sample size for that health center. Simple random sampling method was used to select the first study participant between 1 and K. Then, the skip interval (K) value was added subsequently till the planned sample size was achieved.

Data collection instruments

An interviewer administered questionnaire was used for data collection together with direct observations checklist. The interviewer administered semi structured questionnaire was used to assess the socio-demographic characteristics, supervision status and knowledge related to ENCP. The level of ENCP was assessed using a standardized interview guide/tool having two main parts; direct observations check list and interviewer administered questionnaire [14].

The new born care practice was assessed by using observation checklist summarized based on ten important procedures. The level of practice was considered as "**good**" for participants who practiced the whole ten procedures (Immediately dry the whole body-while assessing the baby's breathing- evaluate breathing (if not birthing-call for help and start resuscitation), Cord care (clamping, tying and cutting, sterile blade after1-3minute of birth), place neonate on mother's ab-

domen or kangaroo mother care (KMC), Helps to initiate immediate breastfeeding within 1 hour, introduce eye drop/tetracycline eye cream, provide Vitamin K injection, Place the newborn's ID bands on the wrist and ankle, Weigh the newborn, Vaccinate at birth(OPV0 and BCG) given correctly or "**poor**" if the respondent misses one or more of the 10 step procedures [14].

Knowledge of health professionals regarding newborn care was assessed by using 28 item questions. Respondents who answered above 75% of the questions correctly were considered as "have good knowledge", 50-75% "have fair knowledge" and less than 50% "not knowledgeable" [14].

Data Collection Procedure

First the tools were prepared in English and then translated to Gede'uffa and Amharic (the commonly spoken language in the study area) and again to English to check its consistency. Eight clinical nurses supervised by two BSc level health officers were involved in the data collection after 2 days training. Then, the tool was pre tested at Chuko health center among 5% (12 health professionals) before the actual data collection. The supervisors and data collectors were assigned at different health centers on daily basis. The data were collected by using observation checklist and interviewer administered questionnaire. The data were collected from health professionals by direct observation to see whether they perform the newborn care in line with the 10 essential newborn care procedures or not. The health professionals were aware of whether they were being observed or not during the data collection. After that the researchers interviewed them to get socio demographic, knowledge, training and supportive supervision related information.

Data quality control

Before the actual data collection, an English version questionnaire was translated to the local languages (Gedeufa and Amharic) to make it more understandable. Training was delivered for supervisors and data collectors regarding the contents of the questionnaire, data collection procedures and what they can do if a professional is not knowledgeable for 2 days. Moreover, pretest of the questionnaire was done at Chuko health center among 5% (12 health professionals) before collecting the actual data collection. After the pretest, the expressions of some questions were modified using simple words.

Data processing and management

First, the data were intensively checked for its completeness and uniformity. After checking, the data were entered to EPI-INFO-version 3.5 (software) and exported to statistical package for social science (SPSS) statistical software version twenty for analysis. Uni-variable descriptive statistics was used to quantify the level of ENCP and the characteristics of the study participants. Both Bi-variable and multivariable logistic regression analysis were employed to identify the factors associated with ENCP. After Bi-variable analysis, variables with a P-value of less than 0.25 were considered as candidate for multivariable logistic regression. In multivariable logistic regression analysis, P-value of < 0.05 was considered as statistically significant association with ENCP. Adjusted Odds Ratio (AOR) with corresponding 95% CI was used to measure the level of the association.

Results

Socio-demographic Characteristics of the Respondent

About 233 health professionals participated in the study making 100% response rate. Less than half, 99(42.5%) of the respondents were in the age ranges of 26-30 years. The mean (±SD) ages of the respondents were 27.24 (± 3.58) years. Almost half of the respondents 115(49.4%) were married, 95(40.8%) unmarried, 15(6.4%) divorced, and 8(3.4%) were widowed. More than half of them were male 123(52.8%) (Table 1).

Table 1 Socio-Demographic Characteristics of Health Professionals Providing Essential Newborn Care Practice in Rural Gedeo Zone Health Facilities, Southern Ethiopia, 2017 ($N = 233$)

Variables	Frequency (number)	Percentage (%)
Religion		
Orthodox Christians	105	45.2
Protestant	102	43.7
Muslims	26	11.1
Professions		
Midwifery	75	32.2
Health officer	42	18
Nurse	116	49.8
Place of work		
Health center	206	88.4
Hospital	27	11.6
Work experience		
1-5 years	194	83.4
6-10 years	30	12.8
Above 10 years	9	3.8
Monthly income (USD)		
53.74-76.87	66	28.3
76.87-100.12	81	34.8
100.12- 123.38	60	25.7
123.38- 146.64	13	5.6
> 146.64	13	5.6
Qualification		
Diploma	147	63.1
Degree	86	36.9
Institution they attained education		
Private institution	77	33
Government institution	156	67

Essential Newborn Care Practice

Results from observation of the delivery room at the beginning of labour and delivery, 83.7% were clean. Majority, 222(95.5%) of health professionals prepared cord cutter and clamper before the onset of delivery (Table 2). Almost three fourth, 173(74.3%) of them did not prepare baby identification band; 209(89.7%) of health professionals prepared suction device before the start of delivery. Moreover, 221(94.8%) of health professionals prepared neonatal Ambu bag and mask before the onset of delivery, but only 75 (32.2%) of them provide vitamin K for the newborn, and 177(76%) of them did not place newborn's identification band on the wrist and ankle.

Above half, 138(59.2%) of them practiced hand washing with water and soap and dried by using cloths; most of them, 217(93.1%) put on the sterile glove, and 186(79.8%) of the health professionals wipes the eye and face of the newborn

Table 2 The Level of Essential Newborn Care Practice among Professionals in Rural Gedeo Zone Health Facilities, SNNPR, Southern Ethiopia, 2017 ($N = 233$)

Essential Newborn care practice observed	Frequency	Percentage (%)
Immediately dry the whole body, while assessing the baby's breathing		
Yes	177	76
No	56	24
Evaluate breathing		
Yes	225	96.6
No	8	3.4
Cord care		
Yes	224	96.1
No	9	3.9
Kangaroo mother care (KMC)		
Yes	58	24.9
No	175	75.1
Helps to initiate immediate breast milk feeding within 1 hour		
Yes	189	81.1
No	44	18.9
Administer Eye drop/TTC eye ointment		
Yes	161	69.1
No	72	30.9
Administer Vitamin K injection		
Yes	75	32.2
No	158	67.8
Place the newborn's identification bands on the wrist and ankle		
Yes	56	24
No	177	76
Weigh the newborn		
Yes	190	81.5
No	43	18.5
Vaccination at birth(OPV0 and BCG) given		
Yes	177	76
No	56	24

Note: *OPV*: oral polio virus vaccine, *BCG*: Bacillie Calmete Guarin vaccine

when the head is delivered; 58(24.6%) of them cleaned eyes of the newborn after birth by using a separate swab., and 205(87.6%) of health professionals immediately dried the whole body with cloth/towel. Fifty-eight (44.9%) of health professionals kept warm by putting the baby skin to skin contact or kangaroo mother care (KMC); 211(90.6%) of them covered the baby's body and head with a clean cloth, and all most all health professionals, 225 (96.5%) checked whether the baby is crying while drying. Most of health professionals 161(69.1%) administered Eye drop/TTC eye ointment and 75(32.2%) administer Vitamin K injection. Over all, among the total of 233 respondents, 177(76%) had poor newborn care practice and the rest 56(24%) had good newborn care practice.

Knowledge of Respondents about Newborn Care

From the total of 233 respondents, 47(20.2%) of health professionals had good knowledge, 146(62.7%) had fair knowledge and 40(17.1%) of health professionals were not knowledgeable (scored below the mean). From a total of 233 health professionals, above half, 127(54.5%) did not know all the ten steps of newborn care practice but less than half of them 106(45.5%) knew the ten steps of newborn care practice.

Health professionals were asked about newborn care practice steps and 92.7% of them said that they immediately deliver newborn on mother's abdomen; 91% responded that they dry baby and give eye care. 83.7% of the respondents reported that they assess breathing; 88.8% reported that they practice cord cutting and care; 81.5% of them said they make early initiation of breast feeding. Moreover, 76% of the respondents reported that they practice skin to skin contact; 78.5% provide TTC eye ointment, and 70% provide vitamin K. 76% of the health care professionals provide vaccination and 83.7% weigh the newborn.

Most, 215(92.2%) of health professionals know the complications of immediate newborn, whereas few of them, 18(7.8%) do not know the complications of immediate newborn. Among those who know the newborn complication, 181(77.7%) of them said the complication is hypothermia, whereas174(74.7%) said asphyxia. However, 155(66.5%) of respondents said infection are mostly occurred complications of immediate newborn.

Training and Supportive Supervision

Almost half, 114(48.9%) of health professionals got in service training about essential newborn care, from which 70(30%) trained once, 37(15%) trained two times and 7(3.0%) trained three times. About 97(41.6%) of them got supportive supervision from their higher officials and nongovernmental organizations (NGOs).

Factors associated with essential newborn care practice

Female respondents were three times more likely to provide good newborn care practice than respondents who are male [adjusted odds ratio (AOR) = 3.08; 95% CI (1.07, 8.81)]. Respondents who are in the age group between 36 and 40 years were 81.8% less likely to provide good newborn care as compared to those between 21 and 25 years [AOR = 0.18; 95% CI (0.03, 0.89)].Respondents who have got supportive supervision within the last three month were two times more likely to give good newborn care than those respondents who haven't got supportive supervision [AOR = 2.17; 95% CI (1.12, 4.19)].

The odds of respondents who were trained related to newborn care were four times more likely to provide good newborn care practice than their counterparts [AOR = 4.25; 95% CI (2.33, 10.09)].

The odds of respondents who have knowledge about the complication of newborn are two times more likely to provide good newborn care practice than the odds of respondents who have no knowledge about the complication of newborn [AOR = 1.98; 95% CI (1.00,3.89)] (Table 3).

Table 3 The factors associated with essential newborn care practice among health professionals of rural Gedeo zone health facilities, Southern Ethiopia, February, 2017 (n=233)

List of Variables and Responses	ENCP		*COR* with 95% *CI*	*AOR* with 95% *CI*
	Good	Poor		
Age in years				
21-25	13	62	1	1
26-30	16	83	5.56(1.60,19.29)	1.37(0.50,3.73)
31-35	12	20	6.05(1.79,20.39)	0.75(0.20,2.76)
36-40	8	6	1.94(0.52,7.16)	0.18(0.03, 0.89)*
>40	7	6	0.87(0.19,3.99)	0.18(0.03,1.12)
Sex of respondents				
Male	36	87	1	1
Female	20	90	1.86(1.00,3.46)	3.08(1.07,8.81)*
Religion				
Orthodox	24	81	1	1
Protestant	23	79	1.01(0.53,1.9)	2.60(0.85,7.94)
Muslim	9	17	0.56(0.22,1.41)	0.76(.16,3.55)
Monthly Salary in (USD)				
53.74-76.87	12	54	1	1
76.87-100.12	22	59	7.87(1.98,31.25)	0.92(0.26,3.22)
100.12- 123.38	9	51	4.69(1.25,17.61)	0.50(0.11,2.22)
123.38-146.64	6	7	8.11(2.02,32.59)	3.44(0.22,52.95)
> 146.64	7	6	3.93(0.71, 21.59)	3.50(0.16,72.3)
Training status				
Trained	42	72	4.37(2.22,8.59)	4.25(2.33,10.09)*
Not trained	14	105	1	1
Respondent's work experience				
< 5 years	36	158	1	1
5-10 years	13	13	2.19(0.52,9.19)	0.09(0.01, 0.60)
> ten years	7	6	0.38(0.08,1.82)	1.14(0.16,7.89)
Status of supportive supervision				
Yes	32	65	2.297(1.24,4.23)	2.17(1.12,4.19)*
No	24	112	1	1
knowledge on ENCP				
Yes	17	89	2.32(1.22,4.40)	0.43(1.22,3.81)
No	39	88	1	1
Knowledge on Complication				
Yes	40	148	2.04(1.0,4.12)	1.98(1.00,3.89)*
No	16	29	1	1

Note: * significantly associated factors (P<0.05)

Discussion

A good newborn care is crucial for the survival of newborn [15]. It includes essential basic newborn care practices (*i.e.* ensuring the air way is clear and remove mucus from the mouth, nose and throat with suction, immediate kangaroo mother care to prevent hypothermia, clean and dry newborn with warm towel, clamp and cut umbilical cord with sterile instrument, providing eye care with tetracycline eye ointment or silver nitrate, giving vitamin K and vaccine, weigh newborn and start breast feeding within one hour) [6].

The result of this study disclosed that only 24% of health professionals were providing good essential newborn care practice (newborn care that fulfills all the components of newborn). This finding is in line with other literatures in southern Ethiopia, Chencha district [16]. However, the result of this study presented that the level of ENCP in Gedeo zone health facilities is lower than a study done in Jimma (51.1%) [11], Addis Ababa (80.7%) [17], Tigray (72.77%) [12], and Khartoum (41.1%) [18]. These differences may be due to study sites in which the current study was conducted in rural health facilities where human resource, medication and materials needed for immediate newborn care practice are limited [19,20].

Respondents providing good ENCP among female professionals were three times higher as compared to male professionals. This might be due to the higher commitment and motherhood feeling of females for newborns and children [21,22].

The odds of giving newborn care decrease by 81.8% among health professionals who are within the age ranges of 36-40 years as compared to 21-25 years. This result is supported by a study done at Indonesia [23]. The possible explanation might be due to the older health professionals are less likely to access updated procedures of essential newborn care practice, and professionals may become tiresome for their work as they become older [24].

Respondents who had got supportive supervision within the last three months were 2.2 times more likely to provide good ENCP as compared to those who had not got supportive supervision. This confirms the idea that supportive supervision has a greater value for health professionals by motivating and updating of essential new born care procedures and protocols [25].

The odds of providing good ENCP among respondents attended newborn care related training were 4.2 times higher than those who never attended training. This conclusion is supported by another similar study done in Tigray [11]. This might be due to the attitudinal change, gain of knowledge and experience sharing while attending professional trainings [26,27].

Limitation

There might be Hawthorns effect, and since it is a cross sectional study design, it might not display the direct cause and effects relationship of dependent and independent variables.

Conclusion

The overall essential newborn care practices among health professionals were not good. Age range of 30-40 years, female sex, supportive supervision, attending training, and knowing complication of the newborn were significantly associated factors with essential newborn care practice. This reveals a requirement to strengthen training and supportive supervision platforms to health professionals working in the rural health centers by the Zonal health department and district health offices, and non-governmental organizations.

Assertions

Abbreviations and Acronyms

AOR	Adjusted Odds Ratio
EDHS	Ethiopian Demographic Health Survey
ENAP	Every Newborn Action Plan
ENCP	Essential New Born Care Practice
IRB	Institutional Ethical Review Board
KMC	Kangaroo Mother Care
MEDHS	Mini Ethiopian Demographic Health Survey
NGOs	Non-Governmental Organizations
OR	Odds Ratio
OPV0	Oral Poliovirus Vaccine
QOC	Quality of Care
SPSS	Software Package For Social Science
SNNPR	Southern Nation, Nationalities Peoples Region
USD	United States Dollar

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Ethical Concern

Before the actual data collection, ethical clearance was obtained from Dilla University institutional ethical review board (IRB), and support letter was accessed from Gedeo Zone Health office. Each respondent gave written consent after clarification about the scope and purposes of the study. The respondents were informed about right of to refuse and or to discontinue their participation at any time they want and no harm will be imposed due to their discontinuation. The filled questionnaires were approved for its completeness and uniformity by the investigators and supervisors. The challenges were solved on time through discussion with concerned bodies. Appropriate explanation/correction was given for a professional found having unfavorable knowledge and or who misses ENCP steps during the data collection.

Consent for Publication - Not applicable

Availability of Data and Materials

The datasets underlying the study are available from the corresponding author up on request.

Competing Interests

We confirm that there are no competing interests on this research work.

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