The shadow challenges to improve the state essential newborn care practices in healthcare providers: evidence from a multicentre cross-sectional study in Ethiopia

Ermias Sisay Chanie1*, Amare Kassaw1, Melkamu Senbeta2, Fisha Alebel GebreEyesus3, Aragaw Tesfaw1, Abenezer Melkie1, Tekalign Amera Birlie1, Biruk Demissie1, Demekes Mesfin Belay1, Demewoze Kefale Mekone1, Biniam Minuye Birhan1 and Wubet Alebachew Bayih1

Abstract
Background: Neonatal mortality can be reduced by providing essential newborn care. However, it is overlooked by most healthcare providers in Ethiopia. Hence, this study aims to examine immediate essential newborn care practices and associated factors among healthcare providers in Ethiopia.

Methods: Institution-based cross-sectional study was conducted among 214 healthcare providers from November 11 to December 19, 2020, at a selected South Gondar health facility. Data were entered into Epi-data 4.2 and then exported to STATA14.0 for analysis. Both bivariable and multivariable logistic regression with a 95% confidence interval were computed. The variable that had a p-value less than 0.25 in bivariable logistic regression was entered into the multivariable logistic regression. In multivariable logistic regression, variables having a p-value < 0.05 were considered a statistically significant association with the poor practice of essential newborn care practice.

Results: The overall essential newborn care practice among healthcare providers was found to be 74.8% (95% CI: 68.4, 80.2). Diploma educational status (AOR = 7.8, 95% CI: 2.80–21.9), presence of workload (AOR = 9.7, 95% CI: 2.76–23.9), unavailability of drugs and vaccines (AOR = 9.8, 95% CI: 6.95–17.7), and having no training (AOR = 3.9, 95% CI: 1.73–8.92) were found to be predictors for poor essential newborn care practices.

Conclusion: Essential newborn care practice among healthcare providers at South Gondar health institutions was found to be low. Being diploma educational status, presence of workload, unavailability of drugs and vaccines, and having no training were found to be independent predictors for poor practice of essential newborn care. Hence, periodic evaluation and strategies are needed for those predictor variables to address the gaps.

Keywords: Essential newborn care practice, Ethiopia, Factors, Healthcare providers

Background
Essential newborn care is the care provided to the neonate after birth within the delivery room by skilled personnel, which includes drying and stimulating, assessing breathing, cord care, skin to skin contact, initiating exclusive breastfeeding, eye care, vitamin K administration, identification band, and weighing [1, 2].
Essential newborn care practices significantly reduce mortality and morbidity risk for the neonate, particularly for very small newborns [2–4]. Skilled care during labor can prevent about 50% of newborn mortality by reducing complications. Likewise, it can prevent 75% of newborn deaths in the postnatal period [5].

WHO planned to reduce neonatal deaths to below 12 per 1000 live births by 2030 [6], and approximately 70% of infant mortality occurs during the neonatal period [6]. Nevertheless, poor essential newborn care practice among healthcare providers, mainly in the resource-limited setting, is a great challenge to achieving the goal [5, 7, 8]. In addition, most healthcare providers give little attention, mainly in resource-limited settings [5, 9, 10].

Although the world health organization endorses improved ENC as a prioritized action around the time of birth to reduce neonatal mortality significantly [11], most healthcare providers do not practice appropriately [12]. Many neonatal mortalities can be reduced by providing essential newborn care. However, it is overlooked by most healthcare providers in Ethiopia [13].

Although different strategies have been implemented to enhance essential newborn care, only 16.4 and 13% of newborns obtained skilled health workers during delivery and the postnatal period respectively [14].

Neonatal mortality is unacceptably high at the time of birth in Ethiopia. However, the state of essential newborn care practice among healthcare providers is not well explored in Ethiopia in general and the study area in particular. Hence, this study aims to assess the immediate essential newborn care practices and associated factors among healthcare providers in South Gondar hospitals, Northwest Ethiopia, in 2021.

**Methods**

**Study setting and period**

The study was conducted at South Gondar hospitals from November 11 to December 19, 2020.

The South Gondar zone hospitals comprise one referral hospital and seven primary hospitals.

There are a total of 717 health care providers providing different services, such as inpatient and outpatient, and neonatal intensive care units. From the total of health care providers, around 397 healthcare providers were midwifery and nurses, according to the South Gondar administrator.

**Study design**

A multicenter institution-based cross-sectional study was conducted.

**Study population**

All healthcare providers who work in South Gondar hospitals.

**Inclusion criteria and exclusion criteria**

All healthcare providers who work in selected South Gondar hospitals were eligible for the study. Whereas, healthcare providers who are seriously ill and on annual leave were excluded from the study.

**Sample size determination and sampling procedures**

A single population proportion formula was used to estimate the sample size and the following assumptions were made: $p = 0.7277$ from the previous study [10], level of significance 5% ($\alpha = 0.05$), 95% confidence level ($Z_{\alpha/2} = 1.96$) and absolute precision or margin of error 5% ($d = 0.05$). Where, $n = \text{sample size}$, $Z = \text{standard normal distribution curve value for the 95% confidence interval (1.96)}$, $d = \text{the margin of error or accepted error}$, $n = 305$ health care providers. Adding a 10% allowance for a non-response rate, the total sample size was 336. But the total number of health professionals at the selected South Gondar health facilities was 214, therefore we included all of them.

There are a total of 8 hospitals in the South Gondar Zone. The hospitals were categorized into referral hospitals and district hospitals strata. Then, from the primary hospitals’ stratum, Addis zemen and Mekan Eyesus, Nefas mucha primary hospitals were selected randomly. From the referral hospital stratum, Debre Tabor referral hospital was selected since it is the only referral hospital in the South Gondar Zone. Then, all midwives and nurses in the selected health institution were included.

**Operation definition**

There were nineteen procedures to assess the immediate newborn care practice through an observation checklist. Then the outcome variable was dichotomized into good practice or poor practice of immediate newborn care practice.

We used the term shadow or hidden observation, which means that the problems are not easy to notice or discover in the study area. This helps stakeholders to find a meaningful opportunity to improve essential newborn care practices, and take insight-driven action to create change in their setting.

- **Good practice**: if the health care providers perform more than or equal to 70% of the practice procedures [10].
- **Poor practice**: if the health care providers perform less than 70% of the practice procedures [10].
Data collection procedures and quality control
The data were collected by four healthcare providers through a pre-tested observation checklist. The checklist comprised socio-demographic and clinical related characteristics. Moreover, data collectors provided the purpose of the study to each study participant before the time of data collection. The validity of the checklist was ensured by developing different types of articles. The pre-test was conducted in 10% of the calculated sample size in another health institution which was not included in the study. Two-day training and orientation were provided about the process of data collection for data collectors and supervisors. Moreover, the filled formats were checked for completeness by the supervisor, data cleaning, and double data were carried out to check for any inconsistencies, coding errors, missing values, and out of range daily.

Data processing and analysis
Data were entered into Epi-data V. 4.2 and exported to STATA V.14.0 for analysis. Nineteen (19) standard checklists were prepared to assess the practice of essential newborn care. The descriptive data were explored through mean, standard deviation, and tables. Both bivariable and multivariable logistic regression with a 95% confidence interval were computed to identify the associated explanatory variable. The variable that had a $p$-value of less than 0.25 in the bivariable logistic regression was entered into the multivariable logistic regression. In multivariable logistic regression, variables having a $p$-value $< 0.05$ were considered a statistically significant association with poor practice of immediate essential newborn care. Multi-collinearity between the study variables was first diagnosed using the standard error and correlation matrix. Besides, Hosmer-Lemeshow statistics and Omnibus tests were performed, and Hosmer-Lemeshow’s test was found to be insignificant ($p$-value $= 0.29$). Additionally, Omnibus tests were significant ($p ≤ 0.01$) indicating the model was fitted.

Results
Socio-demographic characteristics of healthcare providers
Out of 214 healthcare providers, 119 (55.6%) were female. The majority of 166 (77.57%) healthcare providers were orthodox. Likewise, 179 (83.64%) of healthcare providers have a bachelor’s degree or above. Ninety-nine (46.26%) of healthcare providers were age between 25 and 29 years, and 121 (56.54%) were married.

From the total 214 healthcare providers, 136 (63.55%), 86 (40.19%), and 119 (55.61%) were nurses, monthly salary of between 5000 and 6500 Ethiopian birr, and 0–5 years of working experience respectively. One hundred eight (59.81%) of healthcare providers had a workload, whereas 131 (61.21%) of healthcare providers obtained training about immediate essential newborn care practice. Furthermore, 151 (70.56%) and 162 (75.70%) of the healthcare providers informed us that there was available equipment and drugs/vaccines in their working areas respectively (Table 1).

The practice of essential newborn care among healthcare providers
From the total 214 healthcare providers, 165 (77.10%), 170 (79.44%), 174 (81.31%), and 121 (56.54%) were performed hand washing before the procedure, wearing a sterile glove, wearing an apron, and wearing a mask respectively.

The majority of 168 (78.50%), 193 (90.19%), 175 (81.78%), and 181 (84.58%) of healthcare providers have wiped the eyes faces when the head is delivered, dry the baby immediately with a dry towel, Check & sucks the airway after delivery, and take APGAR score respectively. Besides, a large proportion of 171 (79.91%) healthcare providers performed umbilical cord care properly. A large proportion of 187 (87.38%), 137 (64.02%), and 195 (91.12%) of healthcare providers initiated breastfeeding within the first hour of delivery, counseled mothers about new born danger before discharge, and weighed & recorded the baby’s weight respectively. Similarly, 173 (80.84%) of healthcare providers performed skin to skin contact. One hundred forty-three (66.82%) healthcare care providers were administered Vitamin K, and 145 (67.76%) healthcare providers were given eye ointment for neonates (Table 2).

Factors that affect the practice of immediate newborn care among healthcare providers
In bivariate logistic regression analysis, sex, educational status, the field of study, working experience, monthly salary, workload, and availability of drugs and vaccines variables were having $P$-value $< 0.25$ and entered into multivariable logistic regression.

In multivariable logistic regression, male, diploma educational status, presence of workload, and unavailability of drugs and vaccines were found to be predictors of the poor practice of essential newborn care.

The odds of poor practice essential newborn care among diploma healthcare providers were 3.0 times higher as compared to degree or above healthcare providers (AOR $= 3.0$, 95% CI: 12.8–71.8). Moreover, the odds of poor practice of essential newborn care among healthcare providers who had a workload were 2.9 times higher for the poor practice of essential newborn care than among healthcare providers who hadn’t a workload (AOR $= 2.9$, 95% CI: 1.18–7.27). The healthcare providers who were working on unavailability drugs and vaccines
were 5.5 times higher for the poor practice of essential newborn care than the healthcare providers who were working on availability drugs and vaccines (AOR = 5.5, 95% CI: 2.20–13.8). Likewise, the healthcare providers who hadn’t taken essential newborn care training were 3.9 times higher for the poor practice of essential newborn care than the healthcare providers who had taken the training (AOR = 3.9, 95% CI: 1.73–8.92) (Table 3).

**Discussion**

The overall essential newborn care practice among healthcare providers at South Gondar health facility was found to be 74.8% (95% CI: 68.4, 80.2). This finding is consistent with another study conducted in Tigray Ethiopia, 72.77% [10] and Addis Ababa Ethiopia, 80.7% [15]. However, the finding is higher than the study conducted in Uganda 46.5% [16], Sudan41.1% [17], Vietnam 64% [18], Egypt 69.2% [19], Tigray Ethiopia 59.8% [6], and Afar Ethiopia (62.7%) [14].

The difference might be due to variation in accessibility of materials and study participants. Since most of the above studies included all healthcare providers, whereas only nurses and midwives were included in our study. Moreover, the study period can also contribute to the difference because the quality of essential newborn care practice has increased over time.

The odds of poor practice essential newborn care among diploma healthcare providers were 3.0 times higher as compared to degree or above healthcare providers. This finding is consistent with another setting in Ethiopia [5, 9]. This can be explained by the healthcare provider having a higher level of education status can be recognized and manage more common health problems in newborns.

The possible explanation might be that the high educational level of healthcare providers might generally have greater decision-making power and skill regarding the implementation of essential newborn care. Besides, healthcare providers who have a higher level of education might have a chance to obtain different kinds of training and skills that bring good practice in essential newborn care.

The healthcare providers who had a workload were 2.9 times higher for the poor practice of essential newborn care than healthcare providers who hadn’t workload. This is a finding supported by another setting in Ethiopia [6, 14]. In fact, healthcare providers with a workload, their performance are diminished because they may not have sufficient time to perform tasks that can have a direct effect on the quality of care. Besides, heavy healthcare provider workload can influence the care provider’s decision to perform various procedures and, it adversely affects patient safety [20, 21].

The healthcare providers who were working on unavailability of drugs and vaccines were 5.5 times higher for the poor practice of essential newborn care than the
| Variable                                           | Frequency | Percent |
|----------------------------------------------------|-----------|---------|
| Hand washing before the procedure                  |           |         |
| 1. Yes, performed                                  | 165       | 77.10   |
| 2. No, never                                       | 49        | 22.90   |
| Put on a sterile glove                             |           |         |
| 1. Yes, performed                                  | 170       | 79.44   |
| 2. No, never                                       | 44        | 20.56   |
| Wearing apron                                      |           |         |
| 1. Yes, performed                                  | 174       | 81.31   |
| 2. No, never                                       | 40        | 18.69   |
| Wearing mask                                       |           |         |
| 1. Yes, performed                                  | 121       | 56.54   |
| 2. No, never                                       | 93        | 43.46   |
| Wipe the eye & face when the head is delivered     |           |         |
| 1. Yes, performed                                  | 168       | 78.50   |
| 2. No, never                                       | 46        | 21.50   |
| Dry the baby immediately with a dry towel          |           |         |
| 1. Yes, performed                                  | 193       | 90.19   |
| 2. No, never                                       | 21        | 9.81    |
| Check & sucks the airway after delivery            |           |         |
| 1. Yes, performed                                  | 175       | 81.78   |
| 2. No, never                                       | 39        | 18.22   |
| Take APGAR score                                   |           |         |
| 1. Yes, performed                                  | 181       | 84.58   |
| 2. No, never                                       | 33        | 15.42   |
| Umbilical cord care                                |           |         |
| 1. Yes, performed                                  | 171       | 79.91   |
| 2. No, never                                       | 43        | 20.09   |
| Skin to skin contact                               |           |         |
| 1. Yes, performed                                  | 173       | 80.84   |
| 2. No, never                                       | 41        | 19.16   |
| Initiate breastfeeding within the first hour of delivery |   |         |
| 1. Yes, performed                                  | 187       | 87.38   |
| 2. No, never                                       | 27        | 12.62   |
| Administer Vit K                                   |           |         |
| 1. Yes, performed                                  | 143       | 66.82   |
| 2. No, never                                       | 71        | 33.18   |
| Give eye ointment                                  |           |         |
| 1. Yes, performed                                  | 145       | 67.76   |
| 2. No, never                                       | 69        | 32.24   |
| Counsel mother about new bore danger before discharge |   |         |
| 1. Yes, performed                                  | 137       | 64.02   |
| 2. No, never                                       | 77        | 35.98   |
| Weigh & record the baby’s weight                   |           |         |
| 1. Yes, performed                                  | 195       | 91.12   |
| 2. No, never                                       | 19        | 8.88    |
### Table 3  Bivariable and multivariable logistic regression of healthcare providers in South Gondar hospitals, Northwest Ethiopia, 2021 ($n=214$)

| ENBC practice                  | Good (160) | Poor (54) | OR (95% CI) | COR       | AOR       | P-value |
|--------------------------------|------------|-----------|-------------|-----------|-----------|---------|
| **Age**                        |            |           |             |           |           |         |
| 20–24                          | 14         | 5         | 0.77 (0.19–3.16) |           |           |         |
| 35–29                          | 78         | 21        | 0.58 (0.19–1.72) |           |           |         |
| 30–35                          | 55         | 22        | 0.87 (0.29–2.57) |           |           |         |
| > 35                           | 13         | 6         | 1           |           |           |         |
| **Sex**                        |            |           |             |           |           |         |
| Male                           | 64         | 31        | 0.5 (0.25–0.93) | 0.5 (0.22–1.13) | 0.096 |         |
| Female                         | 96         | 23        | 1           |           | 1         |         |
| **Religion**                   |            |           |             |           |           |         |
| Orthodox                       | 133        | 46        | 1.2 (0.24–6.04) | –         |           |         |
| Muslim                         | 20         | 6         | 1.1 (0.17–6.46) | –         |           |         |
| Protestant                      | 7          | 2         | 1           |           | 1         |         |
| **Educational status**         |            |           |             |           |           |         |
| Diploma                        | 22         | 26        | 3.5 (1.78–7.04) | 3.0 (1.28–7.18) | 0.012* |         |
| Degree and Above               | 138        | 28        | 1           |           | 1         |         |
| **Marital status**             |            |           |             |           |           |         |
| Single                         | 57         | 19        | 1.6 (0.40–6.00) | –         |           |         |
| Married                        | 89         | 32        | 1.7 (0.45–6.22) | –         |           |         |
| Divorced/Widowed               | 14         | 3         | 1           |           | 1         |         |
| **Field of study**             |            |           |             |           |           |         |
| Nurse                          | 108        | 28        | 1           |           | 1         |         |
| Midwifery                      | 52         | 26        | 1.9 (1.02–3.61) | 1.2 (0.56–2.73) | 0.600 |         |
| **Monthly salary**             |            |           |             |           |           |         |
| 2000–3500                      | 11         | 7         | 2.1 (0.71–6.17) | 1.2 (0.30–4.78) | 0.803 |         |
| 3500–5000                      | 27         | 6         | 0.7 (0.26–2.04) | 0.7 (0.19–2.30) | 0.599 |         |
| 5000–6500                      | 63         | 23        | 1.2 (0.59–2.44) | 0.8 (0.34–2.08) | 0.708 |         |
| > 6500                         | 59         | 18        | 1           |           | 1         |         |
| **Working experience (in the year)** | | | | | | |
| 0–5 years                      | 73         | 46        | 3.9 (1.29–12.0) | 3.6 (0.96–13.1) | 0.051 |         |
| 6–10 years                     | 62         | 4         | 0.4 (0.09–1.74) | 0.4 (0.07–1.75) | 0.203 |         |
| > 10 years                     | 25         | 4         | 1           |           | 1         |         |
| **Workload**                   |            |           |             |           |           |         |
| Yes                            | 82         | 46        | 4.6 (2.13–10.1) | 2.9 (1.18–7.27) | 0.021* |         |
| No                             | 78         | 8         | 1           |           | 1         |         |
| **Training**                   |            |           |             |           |           |         |
| Yes                            | 100        | 31        | 1           |           | –         |         |
| No                             | 60         | 23        | 3.1 (1.64–5.88) | 3.9 (1.73–8.92) | 0.001** |         |
| **Availability of equipment**  |            |           |             |           |           |         |
| Yes                            | 116        | 35        | 1           |           | –         |         |
| No                             | 44         | 19        | 1.4 (0.74–2.76) |           |           |         |
| **Availability of drugs and vaccines** | | | | | | |
| Yes                            | 131        | 31        | 1           |           | 1         |         |
| No                             | 29         | 23        | 2.5 (1.30–4.98) | 5.5 (2.20–13.8) | 0.000** |         |

* Significant at < 0.05; ** Significant at < 0.01; COR Crude odds ratio, AOR Adjusted odds ratio, CI Confidence interval, ENBC Essential new born care practices
healthcare providers who were working on availability drugs and vaccines. This finding is supported in another setting [6, 9, 10]. Even if the healthcare providers have adequate knowledge and skills regarding essential newborn care practice, they might be unable to provide the service due to lack of materials. Hence, ensuring the essential drugs and vaccines is crucial to improving neonatal health and ultimately decreasing neonatal mortality.

Likewise, healthcare providers who hadn’t taken essential newborn care training were 3.9 times higher for the poor practice of essential newborn care than the healthcare providers who took the training. This finding is congruent with the previous studies [5, 17]. This can be explained by healthcare providers who took essential newborn care training or courses that can ensure the skills and knowledge to provide up-to-date evidence-based information and management for a range of needs in the initial newborn period [22–24].

This study has some limitations. First, this study does have inherent limitations due to the cross-sectional nature of the study, which used a snapshot of assessing essential newborn care practice at one point in time. Secondly, data were collected from midwives and nurse health care providers only that might be over or under the level of essential newborn practice.

Conclusion

Essential newborn care practice among healthcare providers at South Gondar health institutions was found to be low. Being diploma educational status, presence of workload, unavailability of drugs and vaccines, and having no training were found to be independent predictors for poor practice of essential newborn care. Hence, periodic evaluation and strategies are needed for those predictor variables to address the gaps.

Acknowledgements

First of all, we would like to thank Debre Tabor University. Secondly, we would like to thank all of the healthcare providers in south Gondar hospitals. Finally, we would like to thank all data collectors.

Authors’ contributions

ESC contributed to the conception, study design, data acquisition, data interpretation, and writing of the original article. AK, MS, FAG, AT, AM, TAB, BD, DMB, DKM, JMB, and WAB contributed to visualization, supervision, and writing review & editing, and critically revising the article. All authors read and approved the final manuscript.

Funding

The authors have also declared that there is no financial support for the research.

Availability of data and materials

The data will be available upon request from the corresponding author.

Declarations

Ethics approval and consent to participate

The research was performed in accordance with the Declaration of Helsinki and Ethical clearance was obtained from Debre Tabor University of Institutional Review Board (IRB) of the ethical review committee. The written informed consent was obtained from each study participant after explaining the purpose of the study, and all methods were performed in accordance with the relevant guidelines and regulations. The confidentiality of the study participants was secured.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Author details

1 Debre Tabor University, Debre Tabor, Ethiopia. 2 Assosa University, Assosa, Ethiopia. 3 Wolkitie University, Wolkitie, Ethiopia.

Received: 12 May 2021 Accepted: 7 September 2021

References

1. Essential Care for Every Baby: What Every Newborn Baby Needs. Healthy Newborn Network. 2014 [cited 2021 Jan 14]. Available from: https://www.healthynewbornnetwork.org/blog/essential-care-for-every-baby-what-every-newborn-baby-needs/

2. Essential newborn care [Internet]. Healthy Newborn Network. [cited 2021 Jan 14]. Available from: https://www.healthynewbornnetwork.org/issue/essential-newborn-care/

3. Bryce E, Mullany LC, Khattri SK, Tiel Sch JM, LeClerg SC, Katz J. Coverage of the WHO’s four essential elements of newborn care and their association with neonatal survival in southern Nepal. BMC Pregnancy Childbirth. 2020;20(1):540.

4. Saaka M, Ali F, Vu u F. Prevalence and determinants of essential newborn care practices in the Lwara District of Ghana. BMC Pediatr. 2018;18(1):173.

5. Negussie BB, Hailu FB, Megenta AD. Knowledge and practice of essential newborn care and associated factors among nurses and midwives working at health Centers in Jimma zone, Ethiopia, 2016. J Nurs Care. 2018;7(1):1–10.

6. Tsaw e H, Teshale T, Bahrey D, Mariye T, Teklay G. Immediate newborn care of knowledge, practice and associated factors among health care providers in NorthwesternZonal health facilities Tigray, Ethiopia, 2018. BMC Res Notes. 2019;12(1):427.

7. Yeman e H, Dagnachew E. Knowledge and Practice of Immediate New Born Care (Inc) among Health Professionals in Governmental Health Facilities of Bahir Dar city, North Ethiopia 2016. Qual Prim Care. 2017;25(6) [cited 2021 Jan 14]. Available from: https://primarycare.imedpub.com/abstract/knowledge-and-practice-of-immediate-newborn-care-inc-among-health-professionals-in-governmental-health-facilities-of-bahir-dar-city-north-ethiopia-2016-21305.html.

8. Tes ga y Gebru T, Murugan R, Gebremariam Abbra A, Haftom Goyteom M. Knowledge and practice of immediate newborn care among midwives in central zone public health facilities, Tigray, Ethiopia: a cross-sectional study. BMC Res Notes. 2019;6:12 [cited 2021 Feb 25]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6685261/.

9. Ayenew A, Abebe M, Ewenu M. Essential Newborn Care and Associated Factors Among Obstetrical Care Providers in Awi Zone Health Facilities, Northwest Ethiopia. An Institutional-Based Cross-Sectional Study. Pediatr Health Med Ther. 2020;11:449–58.

10. Berhe AK, Tinase 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):157.
11. WHO, UNODC, UNAIDS technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users – 2012 revision [Internet]. [cited 2021 Jan 14]. Available from: https://www.who.int/publications-detail/978924150437

12. Arba A, Zana Z. Knowledge of Essential Newborn Care and Associated Factors among Nurses and Midwives: A Cross-Sectional Study at Public Health Facilities in Wolaita Zone, Southern Ethiopia, 2019 [Internet]. Vol. 2020, International Journal of Pediatrics. Hindawi, 2020 [cited 2021 Jan 14]. p. e3647309. Available from: https://www.hindawi.com/journals/ijped/2020/3647309/

13. Pagel C, Prost A, Hossein M, Azad K, Kuddus A, Roy SS, et al. Is essential newborn care provided by institutions and after home births? Analysis of prospective data from community trials in rural South Asia. BMC Pregnancy Childbirth. 2014;14(1):99.

14. Abdu H, GebruSelassie M, Abdu M, Mare KU, Tadesse W, Liben ML. Knowledge and practice of immediate newborn care among midwives and nurses in public health facilities of Afar regional state, Northeast Ethiopia. BMC Pregnancy Childbirth. 2019;19(1):422.

15. Wondaferash MT. Assessment of knowledge, attitude, and practice about immediate newborn care among health care providers in addis ababa public health centers. Ethiop J Pediatr Child Health. 2011;7(7):42–79.

16. Ayiasi RM, Criel B, Orach CG, Nabirwebma E, Kolsteren P. Primary health-care worker knowledge related to prenatal and immediate newborn care: a cross-sectional study in Masindi, Uganda. BMC Health Serv Res. 2014;14(1):65.

17. Taha FAN. Assessment of knowledge, attitude and practices of nurse-midwives towards immediate care of the newborn in Khartoum State teaching hospitals. 2016 Dec 6 [cited 2021 Feb 26]. Available from: http://khartoum.space.udo.edu/handle/123456789/23743

18. Eriksson L, Nga NT, Målqvist M, Persson L-Å, Ewald U, Wallin L. Evidence-based practice in neonatal health: knowledge among primary health care staff in northern Viet Nam. Hum Resour Health. 2009;7(1):36.

19. Abd El Fattah N, Negawa A, El Dein Z. Assessment of quality of nursing care provided immediately after birth at university hospital. Life Sci J. 2009;6(4):2115–26.

20. Carayon P, Gurses AP. Nursing Workload and Patient Safety—A Human Factors Engineering Perspective. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville: Agency for Healthcare Research and Quality (US); 2008 [cited 2021 Feb 26]. (Advances in Patient Safety). Available from: http://www.ncbi.nlm.nih.gov/books/NBK26577/

21. Mollart L, Skinner V, Newing C, Fourier M. Factors that may influence midwives work-related stress and burnout. Women Birth J Aust Coll Midwives. 2011;31:26.

22. WHO | Essential newborn care course [Internet]. WHO. World Health Organization; [cited 2021 Mar 1]. Available from: http://www.who.int/maternal_child_adolescent/documents/newborncare_course/en/

23. Chomba E, Carlo WA, Goudar SS, Jehan I, Tihefu A, Garces A, et al. Effects of essential newborn care training on fresh stillbirths and early neonatal deaths by maternal education. Neonatology. 2017;111(1):61–7.

24. Amsalu R, Morris CN, Hynes M, Had HJ, Seriki JA, Meehan K, et al. Effectiveness of clinical training on improving essential newborn care practices in Bossaso, Somalia: a pre and postintervention study. BMC Pediatr. 2020;20(1):215.

Publisher’s Note
Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.