

Original Article



Service utilization and impact on quality care of sick young infants in the primary healthcare units, West Gojjam, Amhara, Ethiopia

Bizuhan Gelaw Birhanu ¹, Johanna Mmabojalwa Mathibe-Neke ²

¹Newborn and Child Health, Community Health System and Primary Healthcare, UNICEF, Ethiopia Country Office, Addis Ababa, Ethiopia

²University of South Africa, Department of Health Studies, College of Human Sciences, Pretoria, South Africa

OPEN ACCESS

Received: Mar 17, 2021

Accepted: Nov 27, 2021

Correspondence to

Bizuhan Gelaw Birhanu

Newborn and Child Health, Community Health System and Primary Healthcare, UNICEF, Ethiopia Country Office, Zambazi Building 2nd, 3rd & 4th floors, Box 1169, Addis Ababa, Ethiopia.

E-mail: bgelaw@gmail.com
bbirhanu@unicef.org

© 2021 Korean Society of Global Health.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID iDs

Bizuhan Gelaw Birhanu

<https://orcid.org/0000-0002-2297-0011>

Johanna Mmabojalwa Mathibe-Neke

<https://orcid.org/0000-0002-5811-8680>

Conflict of Interest

The authors declare that they have no competing interests.

Author Contributions

Conceptualization: Birhanu BG; Methodology: Birhanu BG; Supervision: Birhanu BG, Mathibe-Neke JM; Validation: Birhanu BG, Mathibe-Neke JM; Writing - review & editing: Birhanu BG, Mathibe-Neke JM.

ABSTRACT

Background: Improving the quality of newborn care services and accelerating the service utilization of sick young infants (birth-2 months) is required to contribute to the reduction of neonatal mortality in Ethiopia. This study assesses the service utilization and impact on quality care in the primary healthcare units (PHCUs) in West Gojjam zone, Amhara region, Ethiopia.

Methods: A mixed-method approach with a sequential explanatory design was employed in this study. Data was obtained through an interviewer-administered questionnaire to healthcare providers in the PHCUs. Further data was extracted from the sick young infant registers in the PHCUs for a one-year period. Quantitative data was entered in the EpiData 3.1, exported to SPSS and STATA for analysis. Twenty-six participants from the PHCUs were interviewed through focus group discussions. Qualitative data analysis was done manually, and thematic analysis was undertaken.

Results: More than 40% of health facilities were not meeting the quality of case management tasks for sick young infants (SYIs), and the newborn care knowledge of health providers is significantly associated with the quality of sick young infants' management ($P < 0.05$). The sick young infants' service utilization was only 6.3% of the expected sick young infants' population. The quality of care and service utilization of SYIs are hampered by supply-and demand -side factors namely, inadequately trained healthcare providers, lack of adherence to job-aids, closure of health posts, overburden of HEWs, stock-out of medicines and lack of awareness of sick newborn danger signs, misconceptions on the causes of illnesses and the preference of traditional healers by caregivers.

Conclusion: With the current coverage and quality care of SYIs, the significant reduction of neonatal mortality in the study area might not be achieved. Both supply-and demand-side factors need to be addressed in the PHCUs.

Keywords: Ethiopia, Infant; Neonate; Primary healthcare; Quality of care

INTRODUCTION

Ethiopia achieved under-five mortality (millennium development goal-4) three years ahead of the 2015 deadline with a remarkable decline in child mortality, from 204 in 1990 to 68 deaths per 1000 live births in 2012,^{1,2} and 55 deaths per live births in 2019.³ However, in the year of 2019, newborns death shared about 55% of the under-five mortality which is estimated to be about 100,000 newborns died in the same year.³ Despite of having a good progress on reducing the under-five mortality, Ethiopia has high neonatal morbidity and mortality due to gaps in delivering effective interventions.⁴ In Ethiopia, a higher proportion of neonatal deaths are associated with intrapartum related complications (birth asphyxia and birth trauma), followed by infection and preterm birth complications.⁵

Within Ethiopia, there is a wide regional difference in neonatal, infant and under-five mortality; where neonatal mortality rates range from a low level of 17 per 1,000 live births in Addis Ababa (the capital city of Ethiopia) to high rate of 46 per 1,000 live births in Amhara region; much higher than the national average of neonatal mortality of 31 per 1,000 live births. Before reaching the age of one month, 15% more newborn infants die in Amhara region than in the nation.³

Neonatal sepsis infection is very common and fatal to newborns; early recognition and diagnosis is critical to rapidly take adequate management actions such as treatment with antibiotics to treat the infection and administration of intravenous fluids for resuscitation.⁶ One identified symptom or sign could be enough to assess and classify the severe illnesses for young infants (aged birth-2 months).⁷ If the sick infants below the age of 2 months (birth-2 months) are not timely assessed, classified and managed; could die instantly.⁸

Timely identification of very severe illnesses is crucial to facilitate the referral to higher health facilities. Consequently, at times when the families of the sick young infants (birth-2 months) are not accepting the referral to a higher-level health facility management the treatment of the sick young infants ought to be provided in the health facilities at the outpatient level by trained healthcare providers.^{9,10}

In addition to the integrated management of newborn and childhood illness (IMNCI) at health centres (HCs) and primary hospitals, the community based newborn care (CBNC) initiative including management of the possible serious bacterial infections (PSBI)/very severe diseases (VSD) where referral is not possible has equipped the capacity of the health extension workers (HEWs) to manage PSBI/VSD cases at the health post/community.^{11,12}

Decreasing neonatal mortality is critical for Ethiopia to fast-track its under-five mortality reduction effort to meet the sustainable development goal and beyond. As a result, this study aimed to assess the service utilization and impact on quality care of sick young infants.

METHODS

Study design

A mixed method approach with sequential explanatory design was employed in this research; where the quantitative data was collected and analysed in the first phase of research followed by the collection and analysis of qualitative data in the second phase. This study was used a cross-sectional survey design to assess quality of care, and analyse factors affecting

utilization of neonatal healthcare services at delivery points in the primary healthcare units. In addition, this study employed a focus group discussion in the qualitative phase to explore factors affecting the quality of care and service utilization of sick young infants.

Study setting

This study was carried out in the primary health care units of West Gojjam zone, Amhara region of Ethiopia. West Gojjam is one of the 11 administration zones in the Amhara region which covers 91 HCs and 373 health posts. Finote Selam is the administrative town of the West Gojjam zone. As per the 2007 census conducted by the Central Statistical Agency of Ethiopia; in this zone an estimated population of more than two million (2,106,596) living within 480,255 households with an area of 13,311.94 square kilometers.

Sample size and sampling

StatCalcEpi info version 7 statistical software was used to calculate the sample size. For the sampling units of primary health care units and neonatal service delivery documents, the same number of samples was selected by simple random sampling where each primary hospital, HC and health post were considered as a primary health care unit. The sample was calculated as follows: ninety-one HCs (primary health care units) as a total population size; prevalence is considered as 50% the reason that no similar study was done so far; confidence limits is 5%; confidence level is 95%; design effect is 1 and clusters is considered as 1. Based on the above assumptions, the calculated sample primary health care units were 71 (71 HCs and 71 health posts). As a result, data collection was done from a total 142 health facilities (3 hospitals, 76 HCs and 63 health posts), and all the 15 districts/*woredas* in the West Gojjam zone were represented. Because the primary hospitals were three in number, all these hospitals were considered as a study unit.

Data collection process

Interviewer-administered questionnaires were administered in 221 health workers and HEWs in 142 health facilities including hospitals, HCs and health posts; 2 health workers each in the primary hospital and HCs and one HEW per health post. In addition, 767 sick young infants' case management service statistics were abstracted from sick young infant registers in health facilities for one-year period from January-December 2016. The IMNCI and CBNC experts were employed to abstract the data in the registers and to check the consistency of each case management. In addition, the data collectors provided professional judgment by deciding whether the assessment given versus the classification, the classification given versus the management, and the management versus the stated follow-up visit agreed with the national IMNCI and CBNC protocols recommendation or not. For the qualitative phase, and seven focus group discussions were conducted with health workers (three groups) and health extensions workers (four groups) until data got saturated. Audiotape records and transcripts were used for the focus group discussions.

For the quantitative data collection, 10 experienced health professionals on neonatal and child health services, who has prior experience on data collection in health facilities or provision of supportive supervision or mentorship to health facilities, at least first degree in nursing or health officers, experts on IMNCI and CBNC experts and who speak Amharic (the local language) were selected, trained and deployed in the field. In addition, for the qualitative study, in addition to the experienced co-moderator, the principal investigator took the responsibility of moderation to facilitate the discussion, prompting members to speak, and encouraging all the members to participate.

Data analysis

The data entry was done by using the computer software EpiData 3.1, then the data was exported to Statistical Package for Social Science (SPSS windows version 23; IBM Corp., Armonk, NY, USA) and STATA version 15. For the qualitative study, thematic analysis was employed, and analysis was done manually.

Variables and definition

Dependent variables

The quality of case management of sick young infants: The performance of all three quality proxy indicators from all sick young infants' case management tasks of assessment and classification, classification and treatment, and classification and stated follow-up.

The service utilization of the sick young infants: The utilization of care among sick young infants were defined as the proportion of sick young infants who sought care in the health facilities in a one-year period from the total expected sick young infants or PSBI.

Independent variables

Newborn care knowledge of healthcare providers, essential supplies and equipment, training status, supportive supervision visits.

Sick Young infants: Age includes birth up to 59 days (2 months).

Ethical consideration

Ethical clearance was obtained from University of South Africa Research and Ethics Committee (REC-012714-039), the Amhara regional health bureau and West Gojjam zone provided permission to conduct the study. Likewise, the directors of primary hospital and HCs, and heads of the health posts provide permission to access the maternity ward and under-five clinic, and health professionals and neonatal service documents in their respective health facility. Moreover, written consent was sought from health workers and, health extensions workers to voluntarily participate in the study.

RESULTS

Quantitative result

Fig. 1 illustrates the sociodemographic characteristics of sick young infants (birth – 2 months). Among the 742-sick young infant cases, 38.3% of cases were represented by the age categories of 15-28 days. In addition, the 0–7, 8–14, and 29–59 days of age categories were accounted for 19.5%, 20.9% and 21.3% respectively. **Fig. 1** further illustrates that distribution is almost similar across all the three age categories except for 15–28 days.

Most of the sick young infant cases (61.9%) were abstracted from the health posts' CBNC registers followed by 27.2% from HCs' IMNCI registers and 1.8% from primary hospitals' IMNCI/similar register. The data abstracted from the 0–2-month sick young infants' register showed that 43.5% of the classification were represented by local bacterial infection (infections originated from umbilicus or skin of the sick young infant), 32.4% were classified as having VSD or neonatal sepsis, and 15.5% and 15.1% were classified as having diarrhoea with no dehydration and feeding problem respectively. The rest of classifications were ranged from 0.8% up to 0%. In general, 92.3% of sick young infants' classification was related to the cause of infection.

Among the 240 cases classified as having VSD, 32.9% of the cases were accounted by 15–28 days' age categories; and the rest of the cases were distributed almost equally in the remaining three age categories. The data shows that the prevalence of VSD is equally important from birth to the age of 59 days of the young infants. Of the 326 cases classified as having local bacterial infections, about 39% of cases were from the age categories 15–28 days. The remaining three age categories ranged from 17.5% to 22.7%. Similarly, the occurrence of local bacterial infection from birth to 59 days was equally important. Most sick young infants (80.5%) identified in the primary healthcare were treated at out-patient level. In addition, 14.2% of sick young infants referred to the higher health facility level. Most (58%) of the cases classified as having VSD were treated at the outpatient level.

In addition, 38.5% of VSD referral cases (25.5%) of VSD cases were referred by giving pre-referral treatment; and 13% of VSD cases were referred without giving pre-referral treatment. Despite the referral treatment being recommended in CBNC and IMNCI national treatment guidelines, it was found that 13% out of the 30 VSD cases were referred to a higher health facility level without a pre-referral treatment being given, and 73.3% of those cases were from health posts. Among the 134 VSD cases treated at the outpatient level, 60.4% of the cases were treated by HEWs at HPs in the communities, followed by 39.6% at HCs (26.2% at rural health centers, and 13.4% at urban HCs). The CBNC initiative equipped the capacity of HEWs to treat VSD cases at the health post and initiate treatment at home during postnatal home visits in the community where referral was not possible.

In line with the recommendation of national IMNCI and CBNC protocols for HCs and HPs, all cases classified as having local bacterial infections were treated at outpatient levels in primary hospitals, HCs and HPs. Indeed, more than half of (51.8%) the cases classified as having local bacterial infections were treated at the HPs level, followed by 46.9% at HCs (34.7% of cases in rural HCs, 12.2% of cases in urban HCs). Only 1% of the cases were managed at the primary hospitals level. Among those classified as having VSD, 52.2% of cases received oral Amoxicillin dispersible tablet/syrup and Gentamycin injection for 7 days, 27.5% of cases received Ampicillin and Gentamycin injections for 7 days, and 20.3% cases received Ampicillin and Gentamycin injections as referral treatment. During the sick young infants' register review, the treatment outcome of each sick young infant's status was checked and abstracted. Among the three options of treatment outcomes, 75.2% of the cases reported completion of treatment and 23% were unknown due to incomplete documentation in the register. The data found that 1.6% of the cases did not complete their prescribed treatment.

In the national job-aids/treatment guidelines, HEWs are expected to notify caregivers about the importance of follow-up visits and returning to the facility or creating a referral linkage

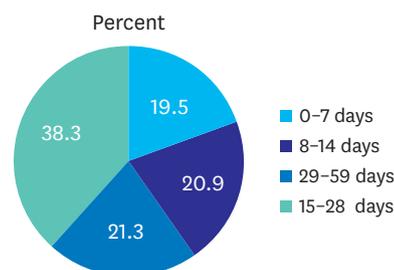


Fig. 1. Percentage distribution of sick young infants' (birth - 59 days) age categories.

with the community volunteers at the community level to know the status of their treatment outcome. Thus, 85.5% of the assessments and classifications reviewed from the sick young infants' registers were reported to be consistent as per the assessment and classification given by the data collectors by reviewing the cases in the registers. In addition, experts (data collectors) agreed with 73.1% of the classification and treatment recommendations provided by the health providers in the assessed health facilities. With the same principle, 71.2% of the classification and stated follow-up date to return to health facility for follow-up visit were consistent with data collectors' labelling. Overall, by computing the average of the above three quality of the case management tasks, 76.6% of cases abstracted in the registers agreed with the data collectors' grading the quality of case management of the sick young infants.

Taking the consideration of the high proportion of local bacterial infections and VSD cases from the total classification seen, quality of case management was checked for the two classifications separately. There was consensus with data collectors in 83% of the assessment versus the classification and 86% of the classification versus the treatment for local bacterial infection cases. Likewise, the assessment versus the classification and the classification versus the treatment for the VSD cases were agreed on 82.7% and 54.1% of the cases. Despite the stringent requirement of fulfilling the dose, schedule and duration for each sick young infant treatment recorded in the sick young infants' registers, the agreement between the classifications versus the treatment for the VSD cases were found to be relatively low when compared with the average quality of case management tasks for all sick young infants and the same assessment indicator with the local bacterial infection classifications.

The quality of sick young infants' case management was computed by considering the successful performance of all three quality proxy indicators from all sick young infants' case management tasks of assessment and classification, classification and treatment, and classification and stated follow-up. It shows that about 55.6% of health facilities fulfil all three quality of case management tasks. Most health facilities were achieving more than 60% of the quality sick young infants case management (66.8% primary hospitals, 61.5% rural HCs and 61.9% health posts) except for rural HCs, which had a score of 47.6%. However, 44.4% of health facilities were not meeting the quality of case management tasks for sick young infants.

Moreover, the multiple regression analysis shows that from the below **Table 1**, 11 listed and computed facility readiness indicators (independent variables) overall newborn care

Table 1. Association between facility readiness indicators and quality of sick young infants' case management

Independent variables	Coefficient	P-value	95% CI
Total number of skilled birth attendants available in the health facilities	-0.001	0.798	-0.009, 0.007
Percent of health workers received newborn health training in the last one year	-0.002	0.236	-0.006, 0.001
Percent availability of basic amenities in the health facilities	0.001	0.660	-0.004, 0.006
Percent of essential equipment available in the health facilities	0.000	0.964	-0.010, 0.010
Percent of essential drugs available in health facilities	-0.005	0.130	-0.012, 0.002
Number of Laboratory tests available in the health facilities	0.081	0.095	-0.014, 0.177
Essential newborn care clinical scenario score	0.005	0.738	-0.024, 0.034
Quality of care for very low birth weight babies' clinical scenario score	-0.021	0.211	-0.055, 0.012
Overall newborn care knowledge of health providers managing sick children and newborns (with score range zero to 10)	0.109	0.010 ^a	0.027, 0.192
Percent of referral communication	-0.009	0.002 ^a	-0.015, -0.003
Percent of health facilities received supportive supervision in the last 3 months	0.085	0.478	-0.153, 0.324
Cons	0.630	0.167	-0.269, 1.529

CI = confidence interval.

^aP-value < 0.05.

knowledge of health providers working in under-five clinic is significantly associated with the quality of sick young infants' management ($P < 0.05$).

The pooled estimate of PSBI incidence risk in neonates was 7.6% in Sub-Saharan Africa, South Asia, and Latin America.¹³ Thus, utilization of care among sick young infants were defined as the proportion of sick young infants who sought care in the health facilities in a one-year period from the total expected sick young infants or PSBI. In addition, the total expected sick young infants or PSBI was calculated as total live births in the districts (*woredas*) considering the total population of each health posts in the *woredas* in that period multiplied by 7.6% (the incidence rate of PSBI). Surprisingly, the sick young infants service utilization of the existing facilities in the zone was only 6.3% from the expected sick young infants' population in one-year period; it was ranged from 0.8 up to 11.9%. It implies that the service utilization of sick young infants was critically low.

Qualitative result

Most of the HCs and HPs FGDs participants revealed that, they are managing VSD/PSBI when it occurs in young infants adhering with the national service delivery guidelines at their respective health facilities. The essential medicine used for managing PSBI are also mostly available in the HCs.

Supply-side factors affecting the quality of care

Inadequate trained healthcare providers in health facilities

Despite the HCs being relatively equipped in terms of skills and essential medicines and supplies, the number of sick young infants who were managed at the HCs in the last four-six months prior to this discussion was very low. They are also repeatedly mentioned that inadequate trained health professionals in the HCs, is one of the key supply side determinant factors for the quality of neonatal health care service in HCs level.

Group 1/Participant 1: "I [Health centre staff] was trained to give health care services for under-5 years of children. When I am not at spot [Health centre], this treatment is being given by professionals for other health services [untrained]; so, the treatment they give is not according to IMNCL. Because of this reason, the health service is below the expected standard."

Group 4/Participant 2: "For children under 5 years of age service there is no health worker [in the health centre] who took updated training. Only one individual had trained, and others are as they are, with old training."

Lack of adherence to the treatment job-aids

In addition to the competency skill to manage PSBI, in most of the times, HPs are also equipped with essential medicine and supplies to treat PSBI cases at community level. In the discussion, it was learned that, even though HEWs were trained on treatment of sick young infants and seriously advised on adhering and referring their job-aids particularly the CBNC chart booklet during the assessment, classification and treatment of every sick young infant. However, some of the HEWs confessed that they are not referring all the time for every sick young infant which is strongly affecting the quality case management tasks for the sick young infants.

Group 6/Participant 1: "If they become unable to breast feeding, if their breathing is abnormal, if their umbilicus become redden, there may be bacterial infection, so we [Health Extension Workers] treat them with an injection. If they gasp and their umbilicus is more redden we refer them."

Group 7/Participant 1: “We [HEWs] don’t refer manuals for treatment sometimes and forget some things if updating trainings are not available.”

Poor quality of PNC home visits

Most of HEWs participants agreed that the type of postnatal care (PNC) service provided during home visit is in a poor quality. Most of the time, HEWs, visited the household without the necessary preparation and carrying the essential supplies and job-aids including the chart booklet and family health guide to be used as checklist to check the danger signs and assess the newborns. In addition, poor documentation after the services provided during the home visit is mentioned by some of HEWs as weakness from the HEWs side. The quality of PNC is compromised since the weight is not measured and the breath per minute is not counted for all newborns. Regarding to the weight scale, the HEWs complained that, the available small weighing scale is not accepted by the mothers and the big one is heavy to care for household visit.

Supply-side factors affecting service utilization

Health post closure

Besides being a supply side factor, the HCs staff are complaining that, the HPs are not open most of the time and so that the communities will not get the services whenever they needed.

Group 2/Participant 1: “Regarding Health Extension Workers, one health post should be open full day; but in reality, this is not functional here. If they stay [in the health posts], they provide service and develop their skill daily, now they become forgetting their skills and the community can’t get quality service.”

In addition, as supply side factor, as per the HEWs discussants, HPs closure and not providing services in a regular time due to most of the HEWs spent their time out of the HPs for community level activities; and stock-out of essential medicines and supplies are among the factors compromising the care seeking practice of sick young infants.

Group 3/Participant 1: “At health posts, I [Health Extension Worker] was working before there was gentamycin and amoxicillin. And we had used to giving young infants treatment if they become sick. But now there is no serious illnesses occurred on infants in this kebele [the smallest administrative unit with about five thousand population].”

As a proxy indicator for the service provision of neonatal healthcare by HEWs at the community level, in the FGDs with HEWs, the expected number of sick young infants’ cases was calculated and analysed with the actual performance by their respective health posts. However, all the participants in these FGDs regrettably acknowledge that the number of sick young infants’ cases were managed in their respective health posts in four-six months’ period prior to this discussion is very low.

Group 6/Participant 1: “Before five months [this FGD] we [Health Extension Workers] have identified one sick young infant and referral [to the HC] was sought.”

Group 6/Participant 1: “Out of ten newborns, may be ten of them [all of them their uvula might be cut]. But we are teaching them this practice is a harmful practice. Their parents rigidly argue that cutting off is a permanent relief.”

Over burden with different and unplanned activities

Most of the HEWs FGD discussants agreed that HEWs are overburden many activities in on top of the sixteen packages of health extension programme. They believed that feeling bored is hinder them in providing the required neonatal health care services. In the discussion, even though, there are already planned activities, HEWs are providing much for urgent issues which are under strict follow-up and evaluation.

Group 3/Participant 6: “Because of all activities are concerning our duty [Health Extension Workers] sometimes we become bored. For example, health insurance, mothers care, infants care etc. We give more attention for what is asked recently.”

In addition, unplanned tasks usually with a short deliverables time periods are shifting the attention and the focus of the HEWs. As a result, most of the HEWs confessed that, they are not giving attention to the neonatal health care’s services and as well as it is not giving priority by the lower administrators.

Demand-side factors affecting service utilization*Lack of awareness by caregivers of the danger signs*

In addition, discussions were held with Health Workers and HEWs FGDs participants to explore why the care seeking for sick young is low. Thus, factors were identified in both discussion groups. Among the discussion held with the HCs staffs, lack of awareness by the caregivers about the danger signs of the sick young infants and considering local infection as not an illness or not frequently checking the newborns conditions were some of the challenges mentioned by the groups participants as a contributing demand side factor for the low service utilization of the sick newborns.

Group 2/Participant 2: “There is problems from the community to bring young infants to health facility even at times when danger signs are seen, and newborns are unable to breastfeeding ... if local infection (umbilicus infection) present, some parents not consider it as illness; they bring them after complication. This may be occurred in two cases: parents may not check infants every time or they may not give attention. So, what we see sometimes is that, for example if infants are brought for diarrhoea case and when you check umbilicus you may find pus.”

Misconceptions on the causes of illnesses in sick newborns and young infants

Despite the existing knowledge on the signs of PSBIs, during the discussion with HEWs on the reasons for low service utilization for sick young infants, ‘*sprained*’ of the neonate, “*Mekechet*” in Amharic and tonsillitis have similar signs with the clinical signs of PSBI. The HEWs believe that their care seeking preference was mainly linked to the traditional healers than the nearby health facilities.

Group 3/Participant 1: “They [newborns] become crying, higher fever, fast breathing.” as a sing of ‘*sprained*’ of the neonate, “*Mekechet*” in Amharic.

Group 3/Participant 2: “When newborn unable to sack breastmilk, when their lips dried, and vomiting.”

Preference of traditional healers as cultural practices

The HCs participants also noted that, the cultural practice was mentioned as a challenge; still some of the community members are preferring the care seeking from the traditional healers mainly for the complaint of tonsillitis and for cutting of the newborn's uvula.

Group 2/Participant 2: "Yes, most of them take newborns primarily to local healer, and he [traditional healers] cut their uvula. This is very harmful practice to change through counselling and training."

Most of the HEWs also agreed that, most of the community members feel that their neonate developed tonsillitis, "*intil woreda*" in Amharic, mostly when the newborn develops vomiting, fever, failed to suck breast milk, dried lips, salivation and sneezing. In fact, most of these signs are the clear signs of PSBI. In most of the time, as per the confirmation of HEWs in the discussion, as a cultural practice, the community seeks care primarily for '*sprained*' and tonsillitis from the traditional healers, and they believe that the treatment they are getting will cure the problem than seeking care from the health facilities.

Group 5/Participant 1: "They believe that, when they (family) take them to health facilities, the infant will sick again, but if it is once cut off no illness will come again."

Sub-optimal and irregular program monitoring and mentoring visit

The qualitative study also revealed that, the programme monitoring visits from HCs staff to improve the competency and case management skills of HEWs not regularly done and well-coordinated; and the provision of feedback is inconsistent.

Not often used ambulance for transportation of referred sick newborns and young infants

Moreover, using ambulance for the transportation of sick newborns or young infants is not common at all. This is also affecting the acceptance and compliance of the referral by the families of the newborns. There is an experience of using referral slips as a referral communication mechanism, but it is not often practiced and the provision and receiving of feedback about the referred cases from the referring and receiving health facilities is not also a common practice.

DISCUSSION

Regarding to age the distribution of the sick young infants, in the study done in 2017 in Ethiopia by Okwaraji, Berhanu and Persson, 50% of the cases were 2–4 weeks of age, followed by 31% from 5–8 weeks and 19% were from 0–1 week.¹⁴ Similarly, this study also noted that, similar age distribution of the sick young infants was shown, such as 38.3% of cases were represented by the age categories of 15–28 days; the 0–7, 8–14, and 29–59 days of age categories were accounted for 19.5%, 20.9% and 21.3% respectively. Since all age groups, from birth- 59 days are affected by the VSD/PSBI, the home visits done by the community health workers should not be limited to the early age of the newborns.

In the same study reported by Okwaraji, Berhanu and Persson, the disease classification of sick young infants, 39% was represented by local bacterial infections, followed by VSD (32%) and diarrhoea/dehydration (20%).¹⁴ Likewise, this study has shown a consistent distribution of the disease classification for the sick young infants. Notably, 43.5% of the classification

were represented by local bacterial infection (infections originated from umbilicus or skin of the sick young infant), 32.4% were classified as having VSD and 15.5% were classified as having diarrhoea with no dehydration.

Among those with VSD cases, 51% of them received gentamicin, and 28% received amoxicillin, and 5% received other types of antibiotics (Okwaraji, Berhanu and Persson). Whereas this study shown that, 52.2% of VSD cases received oral amoxicillin dispersible tablet/syrup and gentamycin injection for 7 days, 27.5% of cases received ampicillin and gentamycin injections for 7 days, and 20.3% cases received ampicillin and gentamycin injections as referral treatment.

Concerning with the treatment outcome of VSD/PSBI cases, nearly half of sick young infants were reported to have their health improved; whereas similar percent, 47 their outcome was unknown.¹⁴ However, in this study, 75.2% of the cases reported completion of treatment and 23% were unknown due to incomplete documentation in the register. This study found an improved completion of treatment.

In the study done in Ethiopia by Amouzou et al.,¹⁵ only few sick children from age of 2-59 months were seeking care from integrated community case management (iCCM) providers (average 16 per month). Similarly, despite there is a difference in the age group which was addressed by both studies, this study, revealed that, the sick young infants service utilization of the existing facilities in the zone was very low (only 6.3%).

In this study, as per the report of HEWs and HWs, still some of the community members are preferring the care seeking for sick young infants from the traditional healers mainly for the complaint of tonsillitis and for cutting of the newborn's uvula. The finding of this research is also supported by evidence from central and southern Ethiopia on the newborn care seeking practices, it has shown that, there was a practice of home-based remedies and seek care for their sick newborns either from traditional healers from the community or by visiting health facilities.¹⁶

The importance of having the transportation services for sick newborns is documented by different literature for timely care seeking, to improve the outcome of sick newborn management and reduction of neonatal mortality. The unnecessary delay for care seeking particularly for not timely transporting sick newborns to hospitals was found to be one contributing factor for the deaths of newborns in Nigeria.¹⁷ Well trained and equipped transport system are key factors for improving the outcome of sick newborns management.¹⁸ Similarly, in India, it is emphasized that improved transport could be a solution for reduction of stagnant neonatal mortality in India.¹⁹ However, in this study, the practice of transportation of sick newborns to the higher health facilities with ambulance was either very low or none, which highly comprise the both the quality of care and the service of utilization of sick young. In the study area, and as well as in Ethiopia, the majority of the population are living in the rural area and distant from hospital, without arranging the transportation services, issuing only referral might not facilitate the completion of the referral of sick young infants.

In other study Ethiopia documented by Warren, when the newborns are sick, in most cases the families preferred seek care form the traditional healers than healthcare providers due to some beliefs which are related to cultural and religious, limited access to healthcare facilities and payment ability for the expected expenses.²⁰ In line with existing evidence, in this study, the HEWs and HWs participants agreed that, the traditional healers are still considered as the

choice of preference to seek care for their sick newborns in some portion of the community's members. Despite the existing knowledge on the signs of VSD/PSBIs, during the discussion on the reasons for low service utilization for sick young infants, 'sprained' of the neonate, "Mekechet" in Amharic and tonsillitis have similar signs with the clinical signs of VSD/PSBI and their care seeking preference was mainly linked to the traditional healers than the nearby health facilities. In fact, this deep rooted belief, requires a rigorous and tailored social behavior change communication strategy that targeting families, community and religious leaders, traditional healers, *kebele* administration and community health workers.

If the HPs are not open most of the time and provide curative services, the caretakers might not get the services for sick newborns in their community whenever they need. This would be one of the major bottleneck that decreasing the service utilization of the sick young infants. This study finding is also supported by the study done to understand the Ethiopian HEWs experience on assigning their time to accomplish different tasks in each day; the evidence has shown that, according to HEWs note recorded on their time management, 16 percent of HEWs' time each week is allocated for curative health activities.²¹

Due to the limited coverage of PNC visit to health facilities and low service utilization of the sick young infants, active case detection of the sick young infants during home visits in the postal period is also recommended. However, this study documented that, PNC home visits provided by HEWs are in poor quality, limited coverage and adequate time is not given for counseling of essential newborn care services (ENC), consequently the caregivers behaviors on ENC won't be changed, and the visits might be helpful to actively identify the sick young infants during the home visits. This is also substantiated by the study done in one city of Ethiopia, the study finding has shown that a significant portion of women at their postpartum period were found to be with poor knowledge in regarding to the early newborn care and as well as a limited experience in the provision of ENC.²²

As stated by Verma and Mukherjee in the study done in 2019, human resources, logistics support and medicines and other equipment were some of the supply side factors affecting the delivery of maternal and newborn care in the rural health system in Marhya, India.²³ Similarly in this study, the lack of trained healthcare providers, and stock-out of essential medicines were affecting the quality of service provision for the newborns.

Furthermore, it is noted that, the service provided for the sick young infants at primary healthcare level is critically low. Low service utilization at HPs is also a concern for sick children. In the study done in Ethiopia, it recommends that the management of severe illnesses for the under-five children and the utilization of integrated community case management services at HP level should be improved to increase the chances of impact on child mortality.²⁴

Overall, the supply and demand side factors by this study were consistent with the scoping review done by Miller et al.²⁵ on the scoping review to understand the barriers to the utilization of community-based child and newborn health services in Ethiopia.

The service utilization of sick young infants is very low. In addition, more than forty percent of health facilities were not meeting the quality of case management tasks for sick young infants, and the newborn care knowledge of health providers has impact on the quality of sick young infants' management. With the current level of sub-optimal quality care and low

service utilization of sick young infants hampered by the supply and demand side factors, the significant reduction of neonatal mortality in the study area might not be achieved. The supply-side factors such as inadequately trained healthcare providers on case management, lack of adherence to job-aids, closure of health posts, over burden of unplanned activities for HEW, stock-out of essential medicines, ambulances are not often used for transportation of referred sick newborns and young infants, and sub-optimal program specific or mentorship support.

On the other hand, demand- side factors, such as lack of awareness of sick newborn danger signs by caregivers, misconceptions on the causes of illnesses and the preference of traditional healers should also be addressed at the primary healthcare level.

Limitation of this study

The perception of caregivers on the quality of care provided by the primary health care units and their reasons for low care seeking for their sick newborns/sick young infants was not included in this study.

ACKNOWLEDGMENTS

We wish to thank Amhara Regional Health Bureau and West Gojjam Zonal Health Department for their keen support and approval of this study. We thank also the data collectors for their commitment and professionalism; and primary health care unit staff for their time and volunteerism to get the required data.

REFERENCES

1. UNICEF. Committing to child survival: a promise renewed; Progress report 2014. https://data.unicef.org/wp-content/uploads/2015/12/APR-2014-17Oct14-web_194.pdf. Updated 2014. Accessed January 10, 2021.
2. Lopez AD. Levels & trends in child mortality: United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME), report 2020. <https://data.unicef.org/resources/levels-and-trends-in-child-mortality>. Updated 2014. Accessed January 15, 2021.
3. Ethiopian Public Health Institute. *I. Ethiopia Mini Demographic and Health Survey 2019: Key Indicators*. Rockville, MD: EPHI and ICF; 2019.
4. Ruducha J, Mann C, Singh NS, Gemebo TD, Tessema NS, Baschieri A, et al. How Ethiopia achieved millennium development goal 4 through multisectoral interventions: a countdown to 2015 case study. *Lancet Glob Health* 2017;5(11):e1142-51.
[PUBMED](#) | [CROSSREF](#)
5. World Health Organization. Distribution of causes of death among children aged < 5 years (%). [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/distribution-of-causes-of-death-among-children-aged-5-years-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/distribution-of-causes-of-death-among-children-aged-5-years-(-)). Updated 2017. Accessed January 25, 2021.
6. Cohen J, Vincent JL, Adhikari NK, Machado FR, Angus DC, Calandra T, et al. Sepsis: a roadmap for future research. *Lancet Infect Dis* 2015;15(5):581-614.
[PUBMED](#) | [CROSSREF](#)
7. Young Infants Clinical Signs Study Group. Clinical signs that predict severe illness in children under age 2 months: a multicentre study. *Lancet* 2008;371(9607):135-42.
[PUBMED](#) | [CROSSREF](#)
8. World Health Organization. Standards for improving the quality of care for children and young adolescents in health facilities. <https://www.who.int/publications/i/item/9789241565554>. Updated 2018. Accessed January 15, 2021.
9. World Health Organization. *WHO Recommendations on Maternal Health: Guidelines Approved by the WHO Guidelines Review Committee*. Geneva: World Health Organization; 2017.

10. World Health Organization. *Guideline: Managing Possible Serious Bacterial Infection in Young Infants When Referral Is Not Feasible*. Geneva: World Health Organization; 2015.
11. Federal Ministry of Health. *Community Based Newborn Care Implementation*. Addis Ababa; Federal Ministry of Health; 2013.
12. Pearson L, Degefe T, Hiluf M, Betamariam W, Wall S, Taylor M, et al. From integrated community case management to community-based newborn care. *Ethiop Med J* 2014;52 Suppl 3:9.
[PUBMED](#)
13. Seale AC, Blencowe H, Manu AA, Nair H, Bahl R, Qazi SA, et al. Estimates of possible severe bacterial infection in neonates in sub-Saharan Africa, south Asia, and Latin America for 2012: a systematic review and meta-analysis. *Lancet Infect Dis* 2014;14(8):731-41.
[PUBMED](#) | [CROSSREF](#)
14. Okwaraji Y, Berhanu D, Persson L. *Community-Based Child Care: Household and Health-Facility Perspectives. Dagu Baseline Survey, Ethiopia*. London: London School of Hygiene & Tropical Medicine; 2016.
15. Amouzou A, Hazel E, Shaw B, Miller NP, Tafesse M, Mekonnen Y, et al. Effects of the integrated community case management of childhood illness strategy on child mortality in Ethiopia: a cluster randomized trial. *Am J Trop Med Hyg* 2016;94(3):596-604.
[PUBMED](#) | [CROSSREF](#)
16. Degefe T, Amare Y, Mulligan B. Local understandings of care during delivery and postnatal period to inform home based package of newborn care interventions in rural Ethiopia: a qualitative study. *BMC Int Health Hum Rights* 2014;14(1):17.
[PUBMED](#) | [CROSSREF](#)
17. Ekwochi U, Ndu IK, Osuorah CD, Amadi OF, Okeke IB, Obuoha E, et al. Knowledge of danger signs in newborns and health seeking practices of mothers and care givers in Enugu state, South-East Nigeria. *Ital J Pediatr* 2015;41(1):18.
[PUBMED](#) | [CROSSREF](#)
18. Thenmozhi M, Sathya J. Impact of mode of transport on the outcome of extramural newborns in a tertiary care centre. *Int J Contemp Pediatr* 2017;4(5):1817-9.
[CROSSREF](#)
19. Roy MP, Gupta R, Sehgal R. Neonatal transport in India: From public health perspective. *Med J DY Patil Univ* 2016;9(5):566-9.
[CROSSREF](#)
20. Warren C. Care of the newborn: community perceptions and health seeking behavior. *Ethiop J Health Dev* 2010;24(1):110-4.
[CROSSREF](#)
21. Mangham-Jefferies L, Mathewos B, Russell J, Bekele A. How do health extension workers in Ethiopia allocate their time? *Hum Resour Health* 2014;12(1):61.
[PUBMED](#) | [CROSSREF](#)
22. Berhea TA, Belachew AB, Abreha GF. Knowledge and practice of essential newborn care among postnatal mothers in Mekelle City, North Ethiopia: a population-based survey. *PLoS One* 2018;13(8):e0202542.
[PUBMED](#) | [CROSSREF](#)
23. Verma M, Mukherjee K. Factors affecting delivery of maternal and newborn care in rural public health system in Madhya Pradesh, India. *Indian J Public Health Res Dev* 2019;10(8):290-5.
24. Miller NP, Amouzou A, Tafesse M, Hazel E, Legesse H, Degefe T, et al. Integrated community case management of childhood illness in Ethiopia: implementation strength and quality of care. *Am J Trop Med Hyg* 2014;91(2):424-34.
[PUBMED](#) | [CROSSREF](#)
25. Miller NP, Bagheri Ardestani F, Wong H, Stokes S, Mengistu B, Paulos M, et al. Barriers to the utilization of community-based child and newborn health services in Ethiopia: a scoping review. *Health Policy Plan* 2021;36(7):1187-96.
[PUBMED](#) | [CROSSREF](#)