

HEALTH FACILITIES' READINESS TO PROVIDE KANGAROO MOTHER CARE (KMC) SERVICE IN TIGRAI REGION, NORTHERN ETHIOPIA

Amanuel Hadgu Berhe¹, Tedros Hailu Abay¹, Marta Yemane Hadush^{1*}, Dawit Seyoum Gebremariam¹, Selemawit Asfaw Beyene², Yibrah Berhe Zelelew¹, Kalayou k Berhe², Solomon weldemariam³, Tirhas Asmelash⁴, Fisseha Ashebir⁴, Araya Abrha Medhanyie²

¹Mekelle university, College of health sciences, School of medicine, Department of Pediatrics and Child Health, Mekelle, Ethiopia.

²Mekelle university, College of health sciences, School of Public Health, Mekelle, Ethiopia.

³Mekelle university, College of health sciences, Department of Midwifery, Mekelle, Ethiopia.

⁴Tigray regional health bureau, Mekelle, Ethiopia.

* Corresponding author: Email- mikiass1708@gmail.com

Abstract

Background: Health care facility expansion in Ethiopia has improved physical access to health services, including new-born care. However, the coverage of KMC in health facilities is limited.

Objective: The objective of this study was to assess the readiness of health facilities (hospitals and health centers) for initiation of facility-based KMC service in Tigray, Northern Ethiopia.

Methods: A facility based cross-sectional study design was used. All 66 health facilities (hospitals and health centers) from 5 zones in Tigray region were included in the study. Facilities were assessed using checklist, key-informant interviews, record review and observation. The service provision assessment tools and WHO service availability and readiness domains were used to generate indicators for KMC service readiness. Descriptive statistics were calculated using SPSS version 20.

Result: All hospitals and 27% of health centers reported providing KMC. Only 29% of the health centers, 33% of hospitals and 66% of primary hospitals fulfilled the minimum WHO criteria for readiness (Staff, space for KMC and functional weighing scale). But it was also found that with the use of postnatal rooms as space for KMC, the practice can be expanded to all health facilities.

Conclusion: There is an opportunity for cascade services to be rolled out to lower-level health facilities, allowing services to be provided closer to home for many families.

Key word: Health facility, Readiness assessment, kangaroo mother care

Introduction

Over the past decade, the Government of Ethiopia has given priority to empower health facilities, especially primary health care facilities such as health centers and health posts. Health care facility expansion has improved physical access to health services, which resulted in high potential (estimated at 92.2%) health service coverage [1].

As a result of the remarkable expansion of health facilities, obstetric and newborn care services are reaching out to the community. Kangaroo mother care (KMC) to pre-term and low birth weight babies is among these services. KMC has emerged as a key intervention package for a number of newborn health initiatives, and this is epitomized by the Every Newborn Action Plan (ENAP) [2].

It is one of the highly feasible and cost-effective interventions that could avert up to 72% of neonatal deaths [3]. Facility-based KMC is an affordable and effective method suited for all premature and LBW babies, particularly those in the developing world, where need is great and resources are scarce [4]. Although strong evidence exists for the effectiveness of KMC and its components (skin to skin contact and breast feeding), the

uptake and coverage of the practice have not progressed well in many countries [5].

Kangaroo Mother Care (KMC) was first introduced in Ethiopia more than two decades back in 1996 at Black Lion Hospital. Recently, KMC was included in a series of policy documents which set to reach 80% of preterm babies with KMC by the year 2020. Despite the emphasis that the government has put into reducing neonatal mortality by using evidence-based strategies such as KMC, the number of preterm/low birth weight (LBW) newborns initiated in KMC remains low [6]. Previous study from three zones of Ethiopia (East Shoa, Sidama, Gurage) which was done in all hospitals found in the zones and 19 randomly selected Health Centers showed that small number of low birth weight newborns, lack of equipment and separate rooms and unavailability of trained staff to be among the barriers for the provision of KMC. The same study found that only 14% of eligible newborns were enrolled in KMC service [7].

This shows that there is underutilization of the practice which is mainly attributed to lack of human and material resources. But WHO recommends that KMC does not require

special facilities to initiate the implementation [8].

Little attention is given to initiate KMC service at primary health facilities. Besides, there is lack of data on whether the health facilities in Tigray have the capacity to provide appropriate KMC care for low birth weight newborns. Therefore this study was conducted to assess the readiness of the health facilities for the initiation of facility-based KMC services at different levels of care and other services for preterm/low birth weight (LBW) babies including availability of knowledgeable and skilled staff, supplies and space.

Methods

Study setting and design

The study was conducted in Tigray region, northern Ethiopia. The region is administratively divided into 7 Zones. A report issued in 2016 by the Tigray regional health bureau stated the region has 52 districts (34 rural and 18 urban) and 805 sub districts (728 Rural and 77 Urban). Ethiopia's health system is divided into the three tier-health system levels: Level one is a district health system comprised of a primary hospital (for 60 000–100 000 people), health centres (for 15 000–25 000 populations) and their five satellite health posts (for 3000–5000 population), connected to one another by a referral system. The primary hospital, health

centres and health posts form a primary health care unit. Level two is a general hospital meant to serve for 1–1.5 million people and level three is a specialized hospital which serves 3.5–5 million people [9]. As of 2015/2016, in Tigray region, there were 1 specialized hospital, 15 general hospitals, 20 primary hospitals, 204 health centers, and 712 health posts. With regards to the number and composition of health professionals, there were 51 specialist doctors, 87 physicians, 3092 nurses, 792 midwives, 562 health officers and 1539 health extension workers [10]. This study was conducted in 17 districts which are found within average radius of 150Kms from Mekelle, capital city of Tigray region. These includes; Southern zone (Endamekoni rural district, Maichew urban district), Southeast zone (Enderta, Degua Temben, Hintalo wajirat, Saharti Samre rural District), Eastern zone (Ganta Afeshum, Adigrat), Central zone (Abi-Adi Urban District and Kola Tembien Rural district), and in 7 sub-cities of Mekelle special zone which have equal administrative organizational hierarchy with rural and urban districts. A facility based cross-sectional study design was used. The study was conducted over one month period in November, 2016. All health facilities that provide new-born care services included in this study.

Sample size and Sampling procedures

A representative sample, totaling 66 facilities was randomly selected from the 17 districts of Tigray. A total of 11 hospitals and 55 health centers participated in the study. Of the 11 hospitals surveyed in this study, 5 were general hospitals, three were primary hospitals, and two were private hospitals and one tertiary hospital. The catchment population for each facility varied widely. Among hospitals, the catchment population ranged from 60,000 to 8 million, the tertiary hospital being the only teaching specialized hospital found in the region. Among the health centers, catchment area populations ranged from as few as 15,000 people to 25,000. From a total of 952 health facilities found in the region 66 health facilities were selected randomly in consultation with Tigray regional health bureau with the consideration of representation of different socio demographic characteristics: urban, rural, different geographic locations and culture. All health care facilities which are at different level of care were included.

Data collection tool and procedure

The survey consisted of facility inventory on equipment, supplies, and medications, as well as staff enumeration by health worker level and neonatal care & KMC training. A standard

checklist was primarily adapted from service provision assessment (SPA) tools developed by measure evaluation [11]. Data was collected through Self-report from respondent, key-informant interviews, record review and observation technique. Ten research assistants who have MSc in health science and who are academic staffs in Mekelle University, college of health sciences were given two days practical and theoretical training on quantitative and qualitative data collection to collect data for health facility readiness assessment. Equipment and supplies were assessed for availability and functionality at the service delivery area. An item was considered available if it was observed to be present and is functional. A facility was considered to offer the service if the interviewee reported that the service could be offered on the day of data collection. The data was collected through face to face interviews with health facility directors and staffs on duty. Health Management Information System (HMIS) experts working in these facilities had also provided the necessary information needed for assessing KMC readiness.

Study variables:

Dependent variable: Health facilities' readiness to provide KMC Service

Independent variable: delivery profile (*total number of delivery, total number of live birth, total number of live birth, total number of birth weight<2500gm, total number of Wt. exactly <200gm, total LBW=200gm*), drug availability, human power & training, equipment & supply, new born care & KMC services, IEC material, New baby transportation

Data quality assurance

Before formal data collection, the questionnaire was modified according to the feedback from the consultative meeting with the steering committee members. To ensure data quality, questionnaire was pre-tested prior to the actual data collection two weeks before the actual data collection period and necessary amendment was done on the questionnaire according to pre-test result. Some questions were rephrased and rearranged to ensure clarity and logical flow. Data collectors were trained at two stages to ensure quality data collection, firstly before pretesting to familiarize and how to use the tools and secondly, immediately prior to the main survey with the tools adapted based on field experience. Senior team members

monitored and rechecked data on random basis at different check points-data collection, data entry and cleaning.

Data processing and analysis

The collected data was edited, coded and checked for completeness and consistency then it was entered and analyzed using SPSS version 20. Characteristics of health facility service and practice were analyzed using descriptive statistics such as frequency and percentage for categorical data. The WHO Service Availability and Readiness Assessment (SARA) domains [12] and Standard international definitions of KMC and WHO practical guide were used to identify tracer items for KMC service readiness (staff profile & guidelines, equipment & infrastructure and medications). Health facility was assessed as ready if the minimum WHO criteria was fulfilled or facilities that reported to provide KMC and have at least the following; defined space for KMC, at least one staff providing KMC and functional weighing scale [8, 12, 13].

Results

Description of health facilities

Data was available for all 66 health facilities which included one tertiary referral teaching hospital, 5 general hospitals, 3 primary hospitals, 2 private hospitals, 54 health centers and one non-profit health center (Table 1). Among the facilities assessed, all offered antenatal care, well-baby check-ups, and served as a point of contact for sick newborns. All the health facilities conduct deliveries but only the hospitals admit and treat sick neonates.

Table 2: Delivery profile of the health facilities in the study areas

Type	From September 2015 – august 2016	Last 3 months performance (July to September 2016)
Total delivery	35,296	7731
Total number of live births	34,795	6890
Total low birth weight <2500gm	1427 (4.1%)	
Total low birth weight- exactly 2500gm	719 (2.1%)	
Total low birth weight <2000gm	837 (2.4%)	163 (2.4%)
Total low birth weight=2000gm	118 (0.3%)	

Delivery profile

There were a total of 34,795 live births across the 66 health facilities from September 2015 to August 2016. From these total live births, 837 (2.4%) newborns had weight less than 2000grams whereas 118 (0.3%) had weight exactly 2000gram at birth. In general, in the last 3 months (from July-September 2016) 7731 deliveries were attended in these health institutions of which 163 babies weigh

<2000gram. Out of these 76.7% (127/163) of them were delivered in the General Public Hospitals (Table 2).

Description of human power and training

There were 288 midwives across the surveyed health facilities. Out of 55 health centers included in the assessment, 19 (34.5%) health centers had less than 3 midwives while 36 (65.5%) had 3 and above midwives. One private hospital had one midwife. One hundred

eighty (62.5%) midwives from 57 health institutions have taken KMC training integrated with other trainings such as Integrated Management of Neonatal and childhood Illness (IMNCI), Basic Emergency Obstetric and neonatal care (BEmONC) and Essential newborn care (ENC). Of which, 49.4% (89/180) midwives had received the training within the last one year.

Equipment and supplies

About 80% (53/66) of health facilities had calibration weight scale; however, they failed to calibrate and weight records were found to be approximated to the nearest 50 to 100 digits (Fig 1).

Functional radiant warmer was found in 52 of the health institutions but limited use of the warmer was seen in most health centers related to lack of skill on how to use (Table 3).

Newborn care and KMC services

All health facilities except 1 hospital and one health center had newborn corner and provide newborn resuscitation service (Except 2 health centers). Five public Hospitals and 1 primary Hospital provide NICU service. All Hospitals and 46 HCs check vital signs regularly even though there is a variation in frequency of measurement among the institutions depending

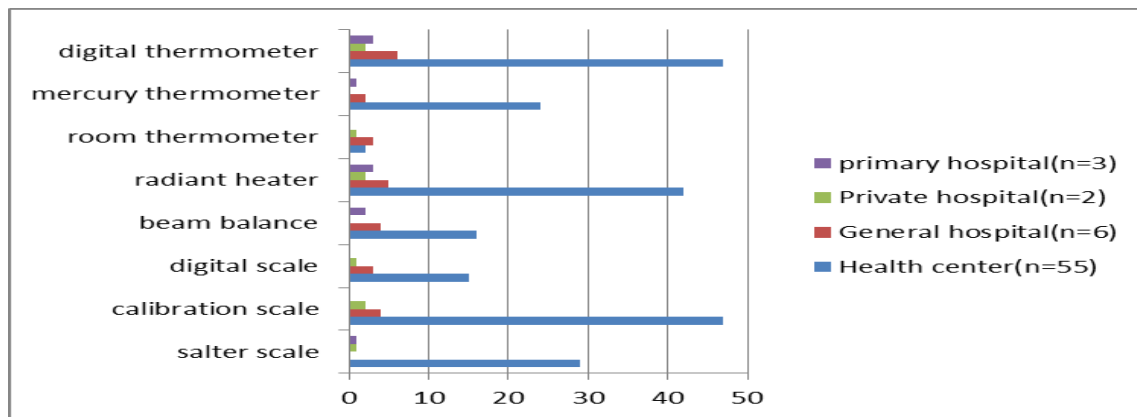


Figure 1: Availability of equipment and supplies at health facility in the study areas

on the situation. All Public Hospitals and 27% (15/55) of health centers reported that they provided KMC service. However the number of LBW babies who had been cared for in a KMC unit is not known due to lack of appropriate documentation (Table 4).

Table 3: Availability of equipment and supplies at health facility in the study areas

Type	Health center N=55	General hospital N=6	Private hospital n=2	Primary hospital n=3
Oxygen cylinder (n=45)	36	5	2	2
Functional Oxygen cylinder(n=23)	18	3	2	1
Functional Oxygen concentrator(n=14)	6	5	1	2
Bag & Mask neonatal size (n=57)	47	5	2	3
Radiant heater (n=56)	46	5	2	3
Incubator (n=13)	6	5	0	2

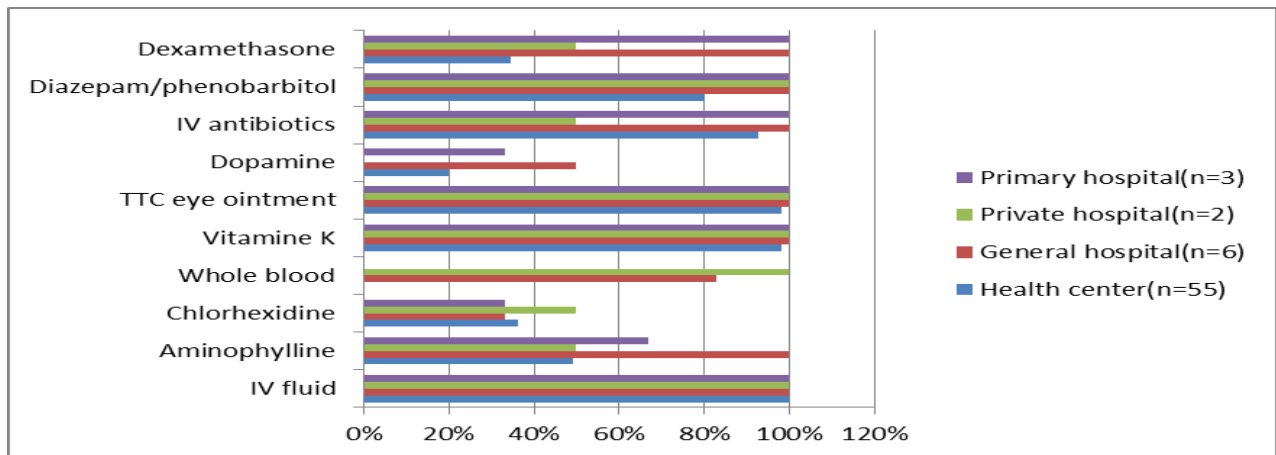


Figure 2: Drug availability in the study areas

Table 4: KMC service given by districts of the study area November, 2016.

Districts	KMC service	Total number of health facilities
Endamekoni	0	4
Ganta Afeshum	1	5
Maychew	3	4
Mekelle	5	15
Enderta	1	5
Hintalo Wajarat	2	8
Seharti Samre	3	7
Degua Temben	3	5
Kola Temben	5	10
Adigrat	1	3
Total number of facilities	24	66

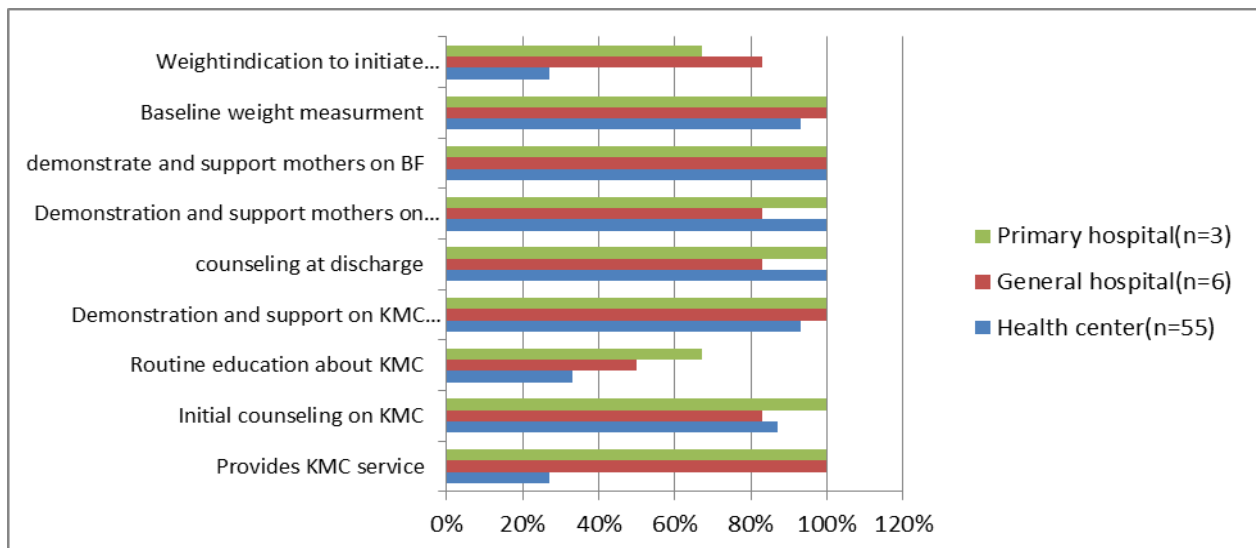


Figure 3: Newborn care and KMC services among the health institutions

Newborn care and KMC services among the health institutions

Out of the total 163 weighing <2000g who were born in the last 3 months, 82.8% (135/163) of them were born in facility and reported that they started KMC there. The rest were referred either from home or non KMC facility. There was no clear registration with regard to this. Twenty six (12.5%) of newborns on whom KMC was initiated were monitored by facility nurses according to the KMC protocol but for the rest there was no clearly documented data. Among the KMC providing health institutions reported, 45.8% (11/24) of them recommended mothers to practice KMC 8 and above per day, 50%(12/24) of them 1-7 hours per day, and 1 of them did not answer to this question. The facilities were also asked for how long that this practice is provided to the baby. Two of them reported for 1 day, 7 of them for about 1 week and 9 of them for more than 1 week up to 40 days. Six health institutions reported that KMC practice should be continued until the weight of the baby is 2-2.5 Kg. There is no complete knowledge on the indications for initiating KMC, the components of KMC and follow up of a newborn in KMC (Figure 3).

KMC service Follow up

With regard to the KMC service follow up, some health centers reported that they had

follow up at home through health extension workers (HEW). Despite this, it was difficult to learn whether the follow up was specific to KMC or the entire MNCH support that is routinely done by the HEWs. There was no linkage and follow up between Hospitals and HEWs or HCs (Figure 4).

The last 3 months study from July – Sep 2016, showed that only 9 discharged newborns after receiving KMC were on follow-up as per the protocol either at facility or in community by HEW at 24 hours, 7 days and 28 days after discharge. Though we were trying to assess the number of newborns discharged according to criteria and number of newborns died before discharge, there was no clear registration for these variables. There was no clear data on how many low birth weight neonates were referred and received KMC.

Presence of potential room to provide KMC

Out of 66 health facilities, 29% (16/55) of the health centers, 33.3% (2/6) general hospitals, 66.7% (2/3) primary hospitals and 50% (1/2) private hospital have potential room to provide KMC either for initiation or continuation. The rest of the health facilities have post natal room which are not convenient to provide KMC (Table 5).

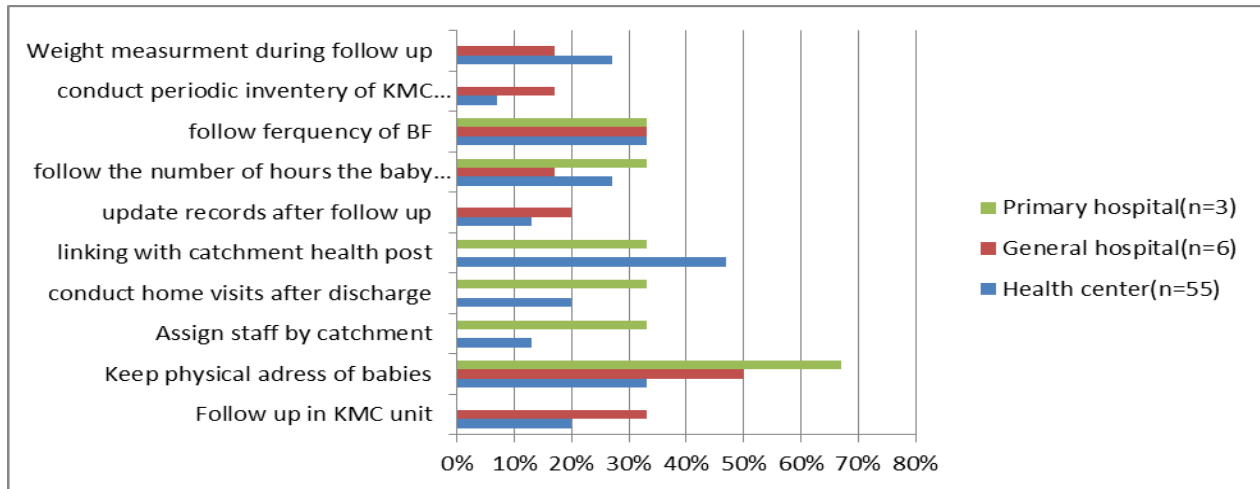


Figure 4: KMC follow up indicators among the health institutions providing KMC service

Table 5: Presence of potential room for KMC among health facilities of study districts

Type of health facility	Potential KMC room	Existing KMC service	Total
Health center	16(29%)	15	31
General hospital	2(33%)	6	8
Private hospital	1(50%)	0	1
Primary hospital	2(66.7%)	3	5

Information, education and counseling (IEC) materials, Audio-visual aid, Management Protocol, Documentation and Reporting

All health centers and hospitals had not KMC leaflet, KMC eligibility criteria, follow up form, standard KMC indicators, display KMC performance, and KMC report. Out of all

Among the health institutions, only 27.2% (18/66) of them reported that they transported/referred the baby with ambulance while on KMC, 24.2% (16/66) with ambulance but not on KMC, 10.6%(7/66) newborn carried by a person but not on KMC.

Additional observation during the assessment

We have observed that in some health centers there was a rounding of weight measurement to the nearest measurement. In most of the health facilities there is no trend of calibrating weighing scales. Some of the hospitals use standard materials (IV fluids) to check the weighing scale and some of them used the pointer if it was at 0. Therefore, some of the weighing scales were increasing weight by 50 to 100 g. In addition, there was a problem in accurately documenting findings in some of the health centers.

In summary, all the 66 facilities give delivery service, 86% of the health workers involved in newborn care received training on KMC integrated with other trainings. Of the assessed facilities, 80% of them have functional weighing scale. Less than one third of health centers and less than half of the hospitals have defined space for KMC.

This means only 29% of the health centers, 33% (2/6) of general hospitals, 50% (1/2) of private hospitals and 66% (2/3) of primary hospitals fulfilled all the minimum WHO criteria for readiness (Staff, space for KMC and functional weighing scale) (**Figure 5**).

But it was also found that with the use of postnatal rooms as space for KMC, the practice can be expanded to at least 80% of the facilities.

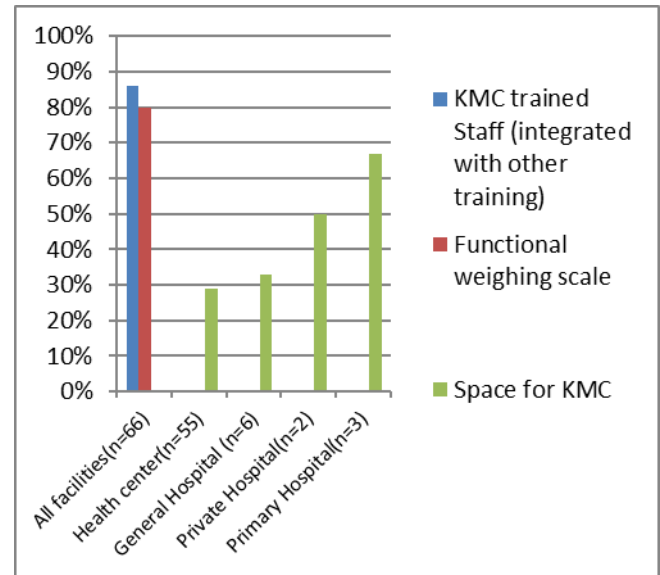


Figure 5: Kangaroo mother care (KMC) readiness among health facilities

Discussion

Ethiopia had first introduced KMC on 1996 and recently has included it in policy documents with a set target of aiming to reach 80% preterm babies with KMC [6]. To attain such an ambitious target, assessing the readiness of facilities to endorse this practice will be important.

In this study, although all hospitals and 27% of health centers reported that they are providing KMC service: only one third of the general hospitals, two third of the primary hospitals and less than one third of

the health centers fulfilled the minimum KMC tracer items (staffing, space for KMC and functional weighing scale).

This was also true in a study done in Malawi where 87 hospitals were assessed, nearly 80% of hospitals reported providing KMC services but less than two-thirds of hospitals had the minimum tracer items and only one in six had all tracer items [13]. In the current study main deficiency from the tracer items was space for KMC which only 29% of the health centers and 45% of the hospitals reported as having a defined space. But with the fact that there is low delivery rate and supply for conventional care is available in almost all facilities; there is a possibility of using the postnatal rooms to provide KMC in health centers and primary hospitals. This makes at least 80% of the studied institutions to be ready to provide KMC.

Accurate and timely identification of low birth weight newborns is required for initiation of KMC. Prevalence of low birth weight delivery < 2000gram in the study area was 2.4% which is lower than the study done in three zones of Ethiopia which showed 5% [7]. Calibration scale was available in most of the health facilities although they do not calibrate before

weighing and there was a tendency to approximate to the nearest 50 to 100 gm. Almost one-third of the midwives in the study area received training on either CBNC, IMNCI or ENC in the last one year but none received training which is focused on KMC. There were no standards in the practice of KMC service in terms of admission criteria, duration, discharge criteria and family counseling. All health centers and hospitals had no guidelines, management protocol and registration and audiovisual aids for KMC.

Readiness to provide KMC services was limited primarily by lack of space, guidelines and trained health workers. Using postnatal rooms to provide KMC, having national guidelines in place at health facilities and having health workers trained to use them in addition to emphasis on skills strengthening through mentorship sessions can help ensure standardization of service provision [13]. By doing simple rearrangement within the postnatal wards to have designated space for KMC service this study believes that health centers besides hospitals can provide KMC for stable babies who do not need intensive care.

Primary health care units have better linkage to the community through community based health workers which can make the continuation and follow up of KMC sustainable. Moreover, majority of health facilities used ambulances during transportation to the admitting hospitals but only few of the study health facilities recommended KMC during referral. Therefore empowering low level facilities on provision of KMC will at least bring the habit of transporting newborns in KMC.

Strength and limitations of the study

The strength of the study was that all health centers were included (large sample size), not only KMC but also newborn care as a whole was assessed. However, the limitations were the quality of KMC provided and skill of health workers were not assessed, and barriers to provide KMC by health workers weren't assessed.

Conclusion

This study concludes that there is an opportunity for cascade services to be rolled out to lower-level health facilities, and allowing services to be provided closer to home for many families. KMC can be initiated at health centres for stable babies after giving KMC training to health workers and assessing their skill and providing IEC

materials and standards in the provision of KMC service in terms of admission criteria, duration, discharge criteria and family counseling.

Declarations

Ethics approval and consent to participate

Ethical approval to conduct the assessment was obtained from the Institutional review board of Mekelle University and by WHO Ethical review committee. In addition, support letter from Tigray regional health bureau and permission from medical directors of the respective facilities was obtained. On the other hand, written consent was taken from every key informant prior to data collection. All data was kept in a safe and secure place in order to ensure confidentiality and beneficence was assured throughout the study period. Only the researchers were access to those data in case of cross checking or validating any data if needed.

Consent for publication

Not applicable.

Availability of data and materials

The data sets used and analyzed during the current study available from the corresponding author on reasonable request.

Competing interests

This manuscript maintains no competing financial interest's declaration from any person or organization, or non-financial competing interests such as political, personal, religious, ideological, academic, intellectual, commercial or any other.

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Authors' contributions

AB, TA & MY conceived and designed the study, analyzed the data and wrote the manuscript. KB, SW, SB, and AM, involved in data analysis, drafting of the manuscript and advising the whole research paper and also were involved in the interpretation of the data and contributed to manuscript preparation.

All authors read and approved the final manuscript.

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