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Readiness to deliver quality curative care for under-five children at health posts in Ethiopia

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Abstract

Background The institutionalization of village health services with salaried community health workers has been established in Ethiopia for over a decade. However, there are serious concerns about the capacity of health posts to provide quality curative care for children under-five.Understanding the readiness of health posts is crucial for improving the care given to sick children. Therefore, this study aimed to assess the readiness of health posts to deliver quality curative care for children under-five in four regional states in Ethiopia.

Methods A facility-based cross-sectional study was conducted at selected health posts across 10 zones in the Amhara, Oromia, SNNP, and Tigray regions. Study participants, including health posts and health extension workers, were selected using a two-stage stratified cluster sampling strategy. The readiness of health post was assessed in terms of infrastructure, human resources, medicines, medical equipment and supplies and job aids. The variations in health post readiness were analyzed using a One-way analysis of variance (ANOVA).

Results A survey was conducted on 169 health posts and 276 health extension workers. The majority of health posts had a toilet facility (83%) and water supply (62%). However, less than a quarter had electricity connection (22%) and communication equipment (18%). Over three-fourths of health extension workers were trained (83%) and supervised (78%) on clinical management of sick children. Less than half (44%) had received clinical mentorship. Availability of essential medicines ranged from 81% for zinc tablets to 28% for cotrimoxazole. Similarly, availability of essential medical equipment varied from 57% for blood pressure apparatus to 86% for thermometer and 99% for Mid-Upper Arm Circumference tape. Only a small portion of health posts (8%) had all critical items for infection prevention practices, which are essential for quality care. Overall, the average percentage availability of items to provide quality curative care to children was 66%, with health post preparedness significantly varying across regions ($P < 0.0001$).

Conclusions The readiness for delivering quality curative care was below standard and significantly varied among health posts across regions. Serious attention is needed to ensure the sustained availability of critical inputs such as trained health extension workers, medicines, medical equipment, and supplies, which is paramount for delivering quality care.

Keywords Health post, Health system capacity, Health extension workers, Quality, Curative care, Ethiopia

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Introduction

The coexistence of infrastructure, medical supplies, and healthcare providers is necessary for optimal healthcare. The five foundational elements that are critical to delivering high-quality health services are health care workers, health care facilities, medicines, devices and other technologies, information systems, and financing [1]. These are the values of care, without which high-quality health care is impossible [2].

Despite this, the health systems of low and middle-income countries are weak and unable to provide optimal or standard care to their populations. The shortage of health workforce, compounded by the unavailability of essential medicines and medical supplies for delivering care for sick children, is challenging the health system of such settings [3]. There is substantial variation in service availability and readiness, particularly at the primary health care level. The effective coverage of sick child health care in Sub-Saharan African countries was very low [4] and varied across countries [5, 6].

There is a direct relationship between the health facility service environment and uptake of services [7] and in turn, health care quality and patient outcomes [8]. In contrast, low quality of health care is related to an increased burden of illnesses in children and healthcare inefficiencies [1, 9]. With an increased demand for services, the health facilities' capacity to offer standard care should be enhanced [10]. Available evidence across nations revealed that health systems with adequately trained and supported community health workers with drugs and medical equipment can provide effective care at the community level [11, 12], particularly in hard-to-reach settings. Though these workers are taken as the backbone of the health workforce in such areas, the lack of support hinder their contributions [13].

The health system of Ethiopia is organized into three levels: primary, secondary, and tertiary. The lowest level of a health facility is called a health post and is the first point of contact between the community and the health system. This health care level is staffed with two or more community health workers known as health extension workers and provides services for a population of 5000 or less. Health promotion, disease prevention, and essential curative services are provided at the health post level as part of the innovative health extension program [14–16]. Around 40,000 health extension workers have been trained and deployed to over 18,000 health posts. Over time, crude coverage of community health services has improved in the country [15].

On the contrary, service users consistently complained about the quality of care delivered at the health post level, mainly related to service availability (medicines and trained providers) [17]. However, there is a lack of large-scale assessment of the capacity of health posts to provide quality curative care for children in Ethiopia. Hence, this study aimed to assess the level of readiness of health posts to provide quality clinical care for sick under-five children in four regional states in Ethiopia: Amhara, Oromia, Tigray and Southern Nations Nationalities and Peoples' (SNNP).

Methods

Study design and setting

A facility-based cross-sectional study was conducted as part of the larger Baseline Survey, which aimed to estimate the effectiveness of Ethiopia's Optimizing Health Extension Program (OHEP). OHEP is a government-led initiative to increase the uptake of health services for children under-five. The study took place in selected health posts across 52 districts in four regional states in Ethiopia: Oromia, Amhara, Southern Nations Nationalities and Peoples (SNNP), and Tigray. Twenty-six of these districts were intervention sites where the planned intervention would be implemented, while the remaining 26 served as comparison sites. The Ministry of Health choose the intervention districts in collaboration with the regional health bureau, and the comparison districts were selected based on similar demographics, key maternal and child health indicators, and health system characteristics. The protocol for OHEP was published [18], and the study was conducted from December 2016 to February 2017.

Study participants and selection procedure

The study participants were selected health posts and health extension workers serving the population in the catchment areas of the health posts. Participants were chosen using a two-stage stratified cluster sampling strategy, with the four regions serving as strata. In the first stage, enumeration areas (EAs) were selected from the study districts using the list of EAs from the 2007 Ethiopian Housing and Population Census as the sampling frame. The total population size of clusters across the study areas was calculated, and 200 EAs were chosen with probability proportionate to size (PPS). Each EA formed a cluster, which served as a primary sampling unit. In the second stage, all health posts and health extension workers located in the selected EAs were included in the study.

Data collection tools and procedures

A structured facility assessment and interview questionnaire was used to gather data (Supplementary file). The questions and contents of the tools were developed based on existing large-scale survey tools such as Service Provision Assessment (SPA)[19] and Service Availability and

Readiness Assessment (SARA)[20]. Each questionnaire was translated into three local languages (Afan Oromo, Amharic, and Tigrigna) and uploaded on tablets (CSPro 6.3) for data collection. All questionnaires were extensively pilot-tested and revised. The pilot test was conducted in non-selected districts of Amhara and Oromia Regions.

In each cluster, a facility assessment was conducted to determine the availability of infrastructure, medicines, medical equipment, medical supplies, and job aids necessary to provide quality health-care. At the same time, all health extension workers present on the day of the survey were interviewed to evaluate their training, supportive supervision, and clinical mentorship status. Data collectors, who were trained professionals with bachelor's degrees and higher, gathered information from each health post. The survey process was overseen by supervisors who were also qualified health professionals with bachelor's degrees and higher. Additionally, a data manager at a central office provided daily data quality checks and feedback to the field teams.

Study variables

The primary outcome variable of the study was the readiness of health posts to provide quality curative care to sick children. The readiness of health posts was assessed using six components: Basic amenities (4 items), Basic equipment (5 items), Diagnostic capacity (1 item), Essential medicines (7 items), Standard precautions for infection control (9 items), and Staff and job aids (5 items). A summary of readiness components was presented in Table 1. The availability of each item was evaluated, and mean availability scores were computed. Guidelines for services at health posts were used to determine readiness based on recommendations [21]. Additionally, WHO criteria were applied to describe the availability rate of essential medicines for children: Very low (less than 30%), Low (30–49%), Fairly high (50–80%) and High (greater than 80%) [22].

Statistical analysis

Data were cleaned for incompleteness, inconsistency, and duplication of values through visual scanning and running frequencies. Variables were coded and recorded in preparation for analysis, and the analysis progressed as follows.

First, the characteristics of health posts and health extension workers were described. An analysis of the primary outcome variables followed this. We computed readiness scores for each component as well as the overall readiness score. The mean percentage availability of items was calculated for individual readiness components and overall. Additionally, we constructed an index for the readiness components based on the data. The variation in readiness of health posts to provide quality care to sick children was analyzed using One-way Analysis of Variance (ANOVA). A 95% Confidence Interval was created for the outcome variables. All statistical analysis was performed using SPSS version 20 (IBM Corporation 2009).

Results

Out of the total planned clusters, six were excluded for security reasons, and data were gathered from 194 clusters. A total of 276 health extension workers across 169 health posts were interviewed. Further, an inventory was done in 169 health posts.

Characteristics of study participants

Due to the selection of the study area, most health extension workers were from the Amhara region (43%), followed by Oromia (35%). Most (65%) health extension workers had Level 3 training, and 15% had other qualifications beyond their original profession. Categories of other qualifications were accounting 11(4%), nursing 9(3.3%), management and human resource management 7(2.5%), midwifery 6(2.2%), information technology 2(0.7%), teaching 2(0.7%), and other professions such as laboratory technician, health officer, law, sociology and agriculture (each accounted of 1). More than three-quarters (83%) of health extension workers reside in the kebele they serve, and less than half (46%) of them were provided residential houses in the kebele they are serving (Table 2). The average service year of health extension workers was 6.5 (SD 3.8).

The availability of infrastructure, essential medicines, medical supplies, equipment, and job aids was assessed at 169 health posts. Of these, 65 (38.5%) were from the Amhara region, 55 (32.5%) were from the Oromia region, 23 (13.6%) were from the SNNP region, and 26 (15.4%) were from the Tigray region. The ratio of Health posts to health extension workers was 1:2, with health extension workers' availability ranging from 1 to 3.

Training, supportive supervision, and mentoring

Nearly one-fifth (19%, 95% CI: 14, 23) of the health extension workers were trained with integrated community case management (iCCM) services in the past 12 months, and the majority (64%, 95% CI: 58, 70) of them trained before last 12 months preceding the survey. Seventeen percent (95% CI: 13, 22) of the health extension didn't take any in-service training or update (Fig. 1).

Over three-fourths (78%, 95% CI: 72, 82) of health extension workers had received at least one supportive supervisory visit in the past 6 months preceding the survey. Of those who received supervision, the majority (75%) have taken supervision from health centers, and

Table 1 Child health care readiness assessment components

S.no	Service readiness components	Categories
1.	Basic amenities (3 items)	1.1. Power supply
		1.2. Water supply
		1.3. Sanitation facilities (Toilets)
2.	Basic equipment's (6 items)	2.1. Child scale
		2.2. Thermometer
		2.3. Stethoscope
		2.4. Blood pressure cuff (apparatus)
		2.5. Tape measure
		2.6. MUAC tape measure
3.	Diagnostic capacity (1 items)	3.1. Malaria diagnostic capacity (RDT)
4.	Essential medicines (7 items)	4.1. ORS
		4.2. Amoxicillin tab 250 (dispersible)
		4.3. Cotrimoazole medicine
		4.4. Paracetamol medicine
		4.5. Vitamin A
		4.6. Zinc
		4.7. Coartem
5.	Standard precautions for infection control (8 items)	5.1. Safe final disposal of sharps
		5.2. Safe final disposal of infectious wastes
		5.3. Appropriate storage of sharps waste
		5.4. Appropriate storage of infectious waste
		5.5. Disinfectant/Chlorine bleach
		5.6. Standard disposable or auto-disable Syringes
		5.7. Soap and towel or handrub
		5.7. Alcohol-based hand rub
		5.8. Clean gloves
6.	Staff and job aids (5 items)	6.1. Staff (HEW) trained in iCCM
		6.2. Guidelines for iCCM/Chart booklet
		6.3. ICCM registration book 2 −59 months
		6.4. Stock card/bin cards
		6.5. Request and re-supply forms

less than one-fifth (15%) received it from the Woreda health office. At health posts, individual supervision was commonly higher than integrated supervision or supervision involving more than one organization (or supervisor). Only 3% of supervision was provided in an integration (Fig. 2).

A large majority of the supervisory visits focused on observation of record keeping (90%), checking the consistency and completeness of registers (87%), and discussing Health extension workers' activities with the Women Development Army (WDA) (86%). In more than half of the visits, management of common childhood illnesses was discussed with the health extension workers, and observation of client consultation by health extension workers was performed in only 55% of the cases. All supervision components were provided to a quarter (26%, 95%: CI 21, 32) of health extension workers (Fig. 3).

Less than half (44%, 95% CI: 38, 49) of health extension workers participated in Performance Review Clinical Mentoring Meetings (PRCMM) in the past 6 months preceding the survey date.

Readiness of health posts to deliver quality child care

Infrastructure

The basic amenities and infrastructures, such as toilet facilities (83.4%) and water supply (62.1%), were available in the majority of the health posts studied. However, only one-fifth (21.9%) of the health posts had electricity connections or other power sources, and communication equipment (facility landline or mobile phone) was

Table 2 Characteristics of health extension workers in the four regions of Ethiopia. Baseline survey, December 2016-February 2017

Characteristics	Frequency	Percent (95% CI)
Level of HEWs training		
Level 3	180	65(59.5–70.7)
Level 4	96	35(29.3–40.6)
HEWs with other profession		
Yes	42	15(11.3–19.8)
No	234	85(80.2–88.7)
Region		
Amhara	119	43(37.4–49.0)
Oromia	97	35(29.7–40.9)
SNNP	20	7(4.6–10.8)
Tigray	40	14.5(10.7–19.0)
HEWs who reside in the kebele they serve		
Yes	229	83(78.2–87.1)
No	47	17(12.9–21.8)
HEWs provided with a residential house		
Yes	129	46.7(40.9–52.6)
No	147	53.3(47.4–59.1)

CI Confidence interval; *HEWs* Health Extension Worker; *SNNP* Southern Nations Nationalities and People

available in 18.3% of health posts. The average percentage availability of basic amenities at the studied health posts in the four regions of Ethiopia was 46.45% (95% CI: 42.71–50.18). Basic amenities availability was highest at health posts in the Tigray region (61.54%), followed by health posts in the Amhara region (54.62%). In the Oromia region, the mean availability of basic amenities was significantly lower at 30.45%. There were significant variations in the mean percentage availability of basic amenities at the studied health posts across regions ($P<0.0001$) Fig. 4.

Essential medicines

The most readily available medicines in the health posts were zinc (81%, 95% CI: 75, 86), followed by amoxicillin (76%, 95% CI 69, 82), paracetamol (72%, 95% CI: 64, 78), and ORS (67%, 95% CI: 59, 74). The least available medicines were chloroquine syrup (14%, 95% CI: 9, 20), artesunate suppository (7%), BP 100 (6%, 95% CI: 3, 11), and plumpy nut (1%).

On average, health posts had five out of the seven essential iCCM medicines: ORS, zinc, amoxicillin, cotrimoxazole, coartem, paracetamol, and Vitamin A. Twenty health posts (11.8%) had all of the iCCM medicines, while three health posts (1.8%) didn't have any of these essential medicines.

The most expired drug was Plumpy nut, found in 65% of health posts, followed by cotrimoxazole (10%), coartem (7%), and chloroquine syrup (7%). The mean days of medicine unavailability ranged from 71 to 148 days (see Table 3).

The mean percentage availability of essential medicines (ORS, zinc, amoxicillin, cotrimoxazole, coartem, paracetamol, and Vitamin A) at the studied health posts in the four regions of Ethiopia was 66.53% (95% CI: 62.68–70.37). Essential medicines availability was highest at Tigray region health posts (79.12%), followed by Amhara region health posts (72.97%). In the Oromia region, the mean availability of essential medicines was low (51.95%). There were significant variations in the mean percentage availability of essential medicines at the studied health posts across regions ($P<0.0001$). See Fig. 5.

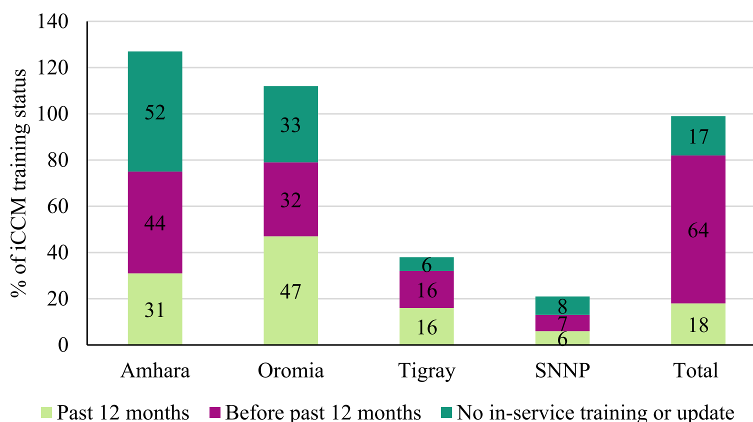

Fig. 1 iCCM Training Status of Health Extension Workers by region

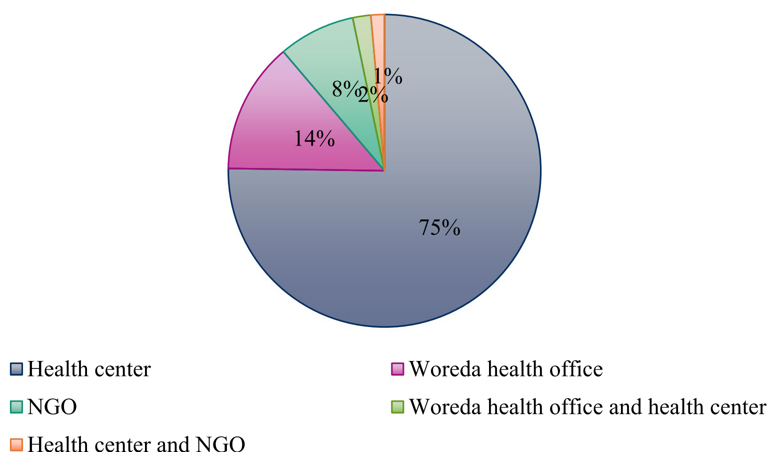

Fig. 2 Supervisory bodies of Health extension workers in the four regions of Ethiopia

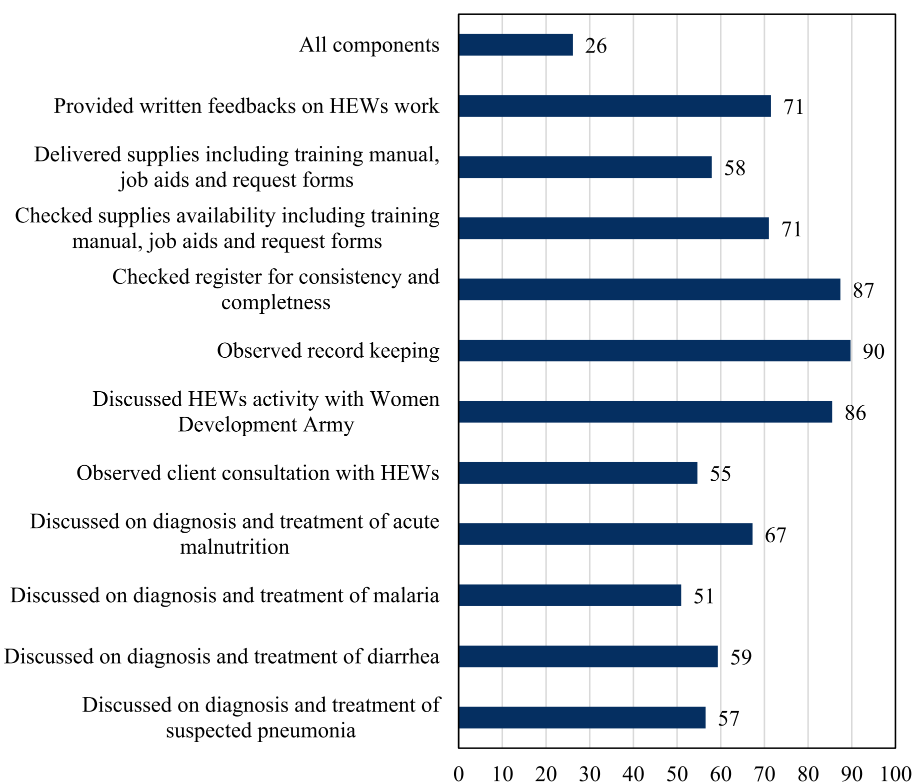

Fig. 3 Components of the supportive supervisory visits to health posts in four regions of Ethiopia

Medical equipment's availability

The commonly available medical equipment were thermometer (86%), infant scale (81%), stethoscope (78%), and MUAC tape (99%). Tape measure (47%) and BP apparatus (57%) were the least available medical equipment. On average, health posts had 4 out of the six basic equipment for child healthcare (infant scale, thermometer, stethoscope, BP apparatus, tape measure, and MUAC tape). Thirty-nine (23.1%) of the health posts had all of the basic equipment, and one health post didn't have any of these basic equipment (Table 4).

The average percentage availability of basic equipment at the health posts studied in the four regions of Ethiopia was 74.56% (95% CI: 71.24–77.87). The availability of basic equipment was highest at health posts in the Tigray region (80.77%), followed by health posts in the SNNP

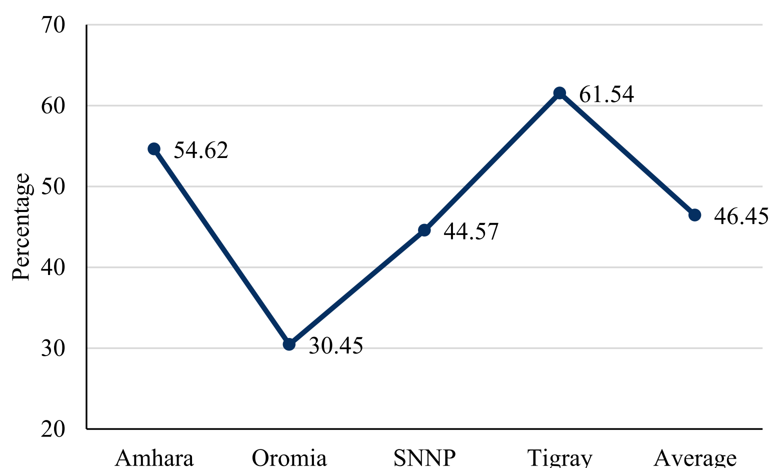

Fig. 4 Mean percentage availability of basic amenities (Infrastructure) in the health posts of Ethiopia

Table 3 Availability of iCCM medicines at health posts of four regions of Ethiopia

Medicines	Available n(%)	Not Avail n(%)	Expired n(%)	Never Avail n(%)	N	Average days of drug stock out	WHO Index[a]
Amoxicillin suspension (125 mg/5 ml)	38 (23)	45(27)	10(6)	76(44)	169	Mean: 71, SD:81; Range:1–365	Very low
Amoxicillin tab 250 (dispersible)	129(76)	9(5)	0(0.0)	31(19)	169	Mean:71, SD:111; Range:5–360	Fairly high
Amoxicillin tab 150 mg(dispersible)	16(10)	6(4)	1(0.6)	146(85.4)	169	Mean:71, SD:73; Range:3–202	Very low
Paracetamol	121(72)	11(7)	7(4)	30(17)	169	Mean:82, SD:115; Range:1–370	Fairly high
ORS	113(67)	33(20)	5(3)	18(10)	169	Mean:71, SD:118; Range:1–720	Fairly high
Zinc	137(81)	10(6)	1(0.6)	21(12.4)	169	Mean:105, SD:120; Range:5–360	Very high
Zinc-ORS	12(7)	11(7)	1(0.6)	145(85.4)	169	Mean:148, SD:215; Range:2–740	Very low
Coartem	97(57)	11(7)	11(7)	50(29)	169	Mean:93, SD:164; Range:1–730	Fairly high
Chloroquine syrup	24(14)	20(12)	11(7)	114(67)	169	Mean:126, SD:176; Range:1–900	Very low
Artesunate suppository medicine	11(7)	9(5)	4(2)	145(85.4)	169	Mean:110, SD:99; Range:3–360	Very low
Cotrimoxazole	47(28)	56(33)	15(10)	51(29)	169	Mean:88, SD:133; Range:2–960	Very low
Plumpy nut	2(1)	11(7)	109(65)	47(27)	169	Mean:93, SD:273; Range:1–999	Very low
BP 100	11(7)	4(2)	2(1)	152(90)	169	Mean:75, SD:141; Range: 2–360	Very low

ORS Oral Rehydration Salt; *RUTF* Ready-to-Use-Therapeutic Food in the form of a compressed biscuit/bar

[a] Medicines availability described as: Very low (less than 30%), Low (30–49%), Fairly high (50–80%), Very high (greater than 80%)

region (76.09%). There were no significant variations in the average percentage availability of basic equipment used for child curative care at the health posts studied ($P = 0.26$) (see Fig. 6).

Diagnostic capacity

The proportion of health posts with malaria diagnostic capacity (RDTs) in the four regions of Ethiopia was 61.5% (95% CI: 54.04–68.65). Malaria diagnostic capacity was highest at Tigray region health posts (80.8%), followed by SNNP region health posts (65.2%). In the Oromia region, malaria diagnostic capacity was relatively low (50.9%). There were no significant variations in malaria diagnostic capacity of studied health posts across the regions ($P = 0.08$) (see Fig. 7).

Standard precaution for infection control

The most commonly available infection prevention supplies were sharps containers (98%), clean gloves (80%), and syringes with needles (83%). Less than half of health posts had chlorine bleach (37%), containers for contaminated waste (49%), soap and towels/ hand rub (37%), and alcohol-based hand rub (37%). On average, health posts had 5 out of the nine infection prevention supplies listed (sharps container, containers for contaminated waste, dustbins, buckets for decontamination solution, chlorine bleach, soap and towels or hand rub, alcohol based hand

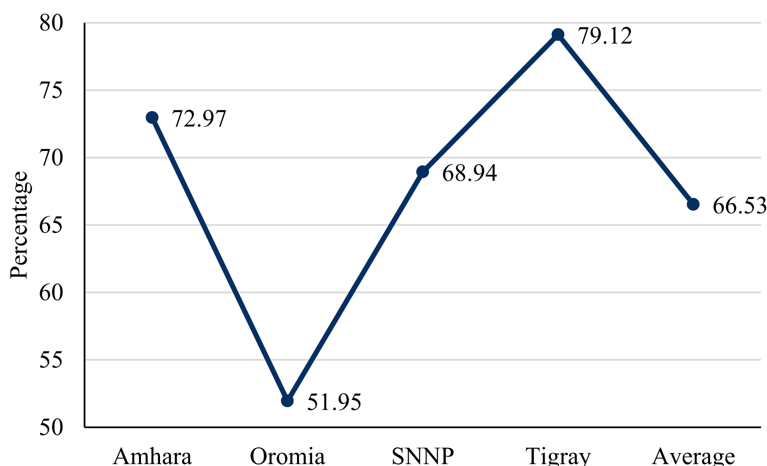

Fig. 5 Mean percentage availability of essential medicines in the health posts of Ethiopia

Table 4 Availability of medical equipment at health posts of Ethiopia

Medical equipment	Frequency	Percent (95% CI)
Thermometer	146	86(81–91)
Infant scale	136	80(74–86)
Weighing sling	124	73(66–80)
Blood pressure cuff	96	57(49–64)
Stethoscope	131	77(71–83)
Watch or clock	37	22(16–29)
Tape measure	80	47(40–55)
MUAC tape measure	167	99(96–100)
Basic equipment availability index[a]	39	23(17–30)

CI Confidence interval; *MUAC* Mid-Upper-Arm-Circumference

[a] Health posts having all basic equipment's: Infant scale, Thermometer, Stethoscope, BP apparatus, Tape measure and MUAC tape

rub, syringes with needles[auto disposable]). Thirteen (7.7%) health posts had all of these items, and two (1.2%) health posts didn't have any of these items (Table 5).

The mean percentage availability of standard precaution items at the health posts studied across the four regions of Ethiopia was 57.2% (95% CI: 53.27–61.12). Standard precautions availability was highest at the health posts of Tigray region (85.47%), followed by the health posts of Amhara region (60.85%). In the Oromia region, mean availability of standard precautions was lowest at 40%. There were significant variations in the mean percentage availability of standard precautions at the health posts studied across the regions ($P < 0.0001$) (see Fig. 8).

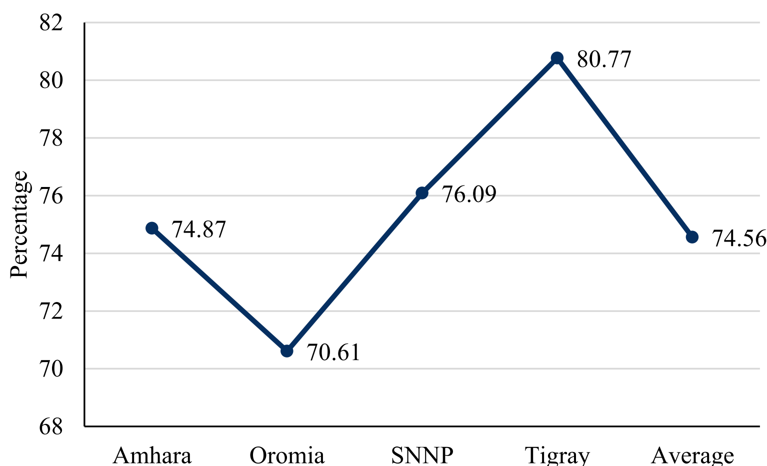

Fig. 6 Mean percentage availability of basic equipment's in the health posts of Ethiopia

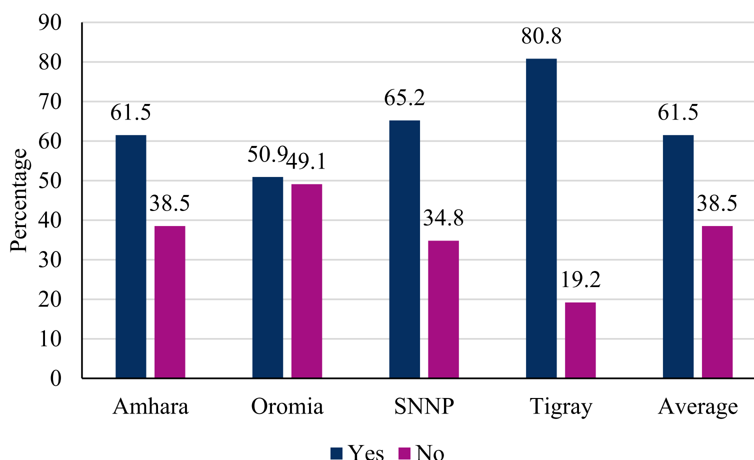

Fig. 7 Percentage of health posts with malaria diagnostic capacity (with RDTs) by region in Ethiopia

Table 5 Availability of infection prevention supplies at health posts of Ethiopia

Medical equipment	Frequency	Percent (95% CI)
Dustbin	99	59(51–66)
Cups/drinking water	135	80(73–85)
Sharps container	165	98(94–99)
Chlorine bleach	63	37(30–45)
Bucket for decontamination solution	60	35(29–43)
Contaminated waste container	82	48(41–56)
Soap and towel or hand-rub	63	37(30–45)
Alcohol based hand-rub	63	37(30–45)
Clean glove	135	80(73–85)
Syringe with needle	140	83(77–88)
Infection prevention supplies availability Index[a]	13	8(4–12)

CI Confidence interval; *MUAC* Mid-Upper-Arm-Circumference

[a] Health posts having all basic supplies: Sharps container, Contaminated waste container, Dustbin, Bucket for decontamination solution, Chlorine bleach, Soap and towel or hand rub, alcohol based hand rub, syringe with needle

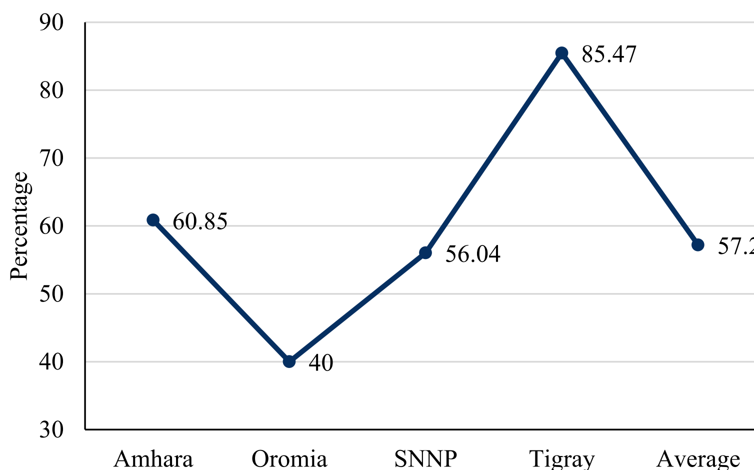

Fig. 8 Mean percentage availability of infection prevention supplies in the health posts of Ethiopia

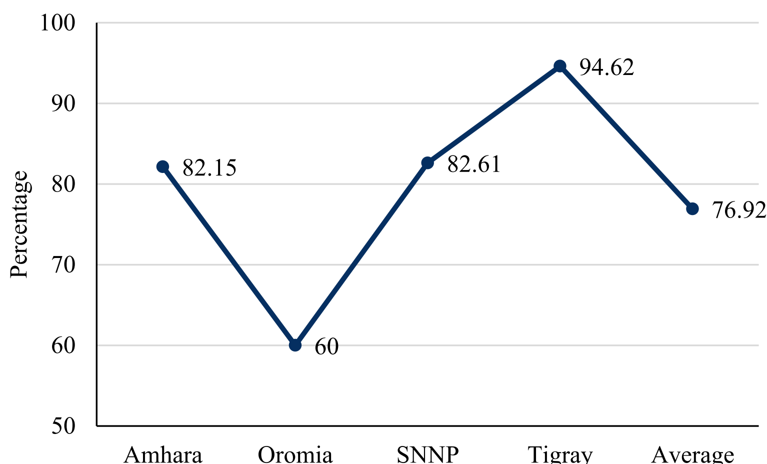

Fig. 9 Mean percentage availability of staff and job aids for child healthcare in the health posts of Ethiopia

Table 6 Trained staff and Job aids availability at health posts of four regions of Ethiopia

Staff and job aids (*N* = 169)	Frequency	Percent (95% CI)
iCCM trained staff	155	92(87–95)
iCCM guideline (Chart booklet)	147	87(81–91)
iCCM registration book (0- < 2 months)	152	90(85–94)
ICCM registration book 2–59 months	156	92(87–96)
Stock card/bin card	93	55(47–62)
Drug request and re-supply form	99	59(51–66)
HMIS reporting forms	154	91(86–95)
Staff and job aids availability index[a]	70	41(34–49)

CI Confidence interval; *iCCM* Integrated community case management; *HMIS* Health management information system

[a] Health posts having trained staff and job aids including iCCM guideline, iCCM registration book, stock/bin card and drug request and re-supply forms

Staff and job aids

The vast majority of health posts had staff (HEWs) trained in iCCM(92%), and had job aids such as iCCM guidelines or chart booklets (87%), iCCM registration books for children aged 2–59 months(92%), and iCCM registration books for children under 2 months (90%). Drug request and resupply forms were available in 59% of health posts, and stock cards/bincards were available in 55% of health posts. Overall, seventy (41%) health posts had staff trained in iCCM and had job aids including iCCM guidelines, iCCM registration books, stock/bin cards and drug request, and re-supply forms (Table 6).

The average percentage availability of staff and job aids at health posts in the four regions of Ethiopia was 76.92% (95% CI: 72.99–80.86). The availability of staff and job aids was highest at health posts in the Tigray region (94.62%), followed by SNNP (82.61%) and the Amhara region (82.15%). In the Oromia region, the average availability of staff and job aids was relatively low at 60%. There were significant variations in the average percentage availability of staff and job aids at the health posts studied across regions ($P < 0.0001$) (see Fig. 9).

Based on the 31 child healthcare readiness components, the mean percentage availability of readiness items for child curative care at the health posts studied in the four regions of Ethiopia was 65.85% (95% CI: 63.03–68.68). The mean percentage of the overall readiness score for health posts ranged from 9.68% to 100%. The health posts in the Tigray region had highest readiness to provide quality child curative care (83.75%), followed by health posts in the Amhara (69.73%) and the SNNP region (67.46%). The mean readiness score of health posts in the Oromia region was relatively low (52.14%). There were significant variations in the readiness of health posts to provide child curative care across regions ($P < 0.0001$) (see Fig. 10).

The staff and job aids component scored the highest readiness of health posts at 77%, followed by the basic equipment component at 75%. The lowest readiness scores were for basic amenities at 56% and standard precaution for infection control at 57% (see Fig. 11).

Discussion

This study revealed deficiencies in the health posts' preparedness to deliver quality curative services for children under five. These deficiencies were apparent when the health posts were evaluated against the standards for human resources, infrastructure, medicines, medical equipment, supplies, and job aids.

When closely examining access to infrastructure, the majority of health posts have a toilet facility and water supply. However, fewer health posts have access to electricity, and landline telephone services. The average

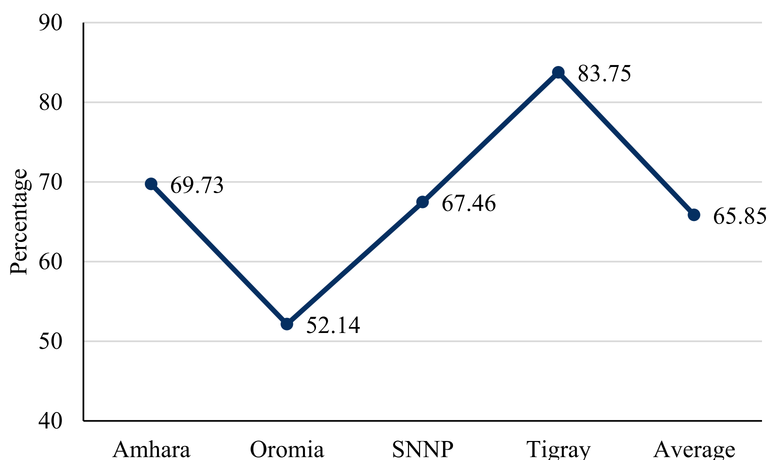

Fig. 10 Mean percentage availability of readiness items of child healthcare in the health posts of Ethiopia (Overall readiness based on 31 items)

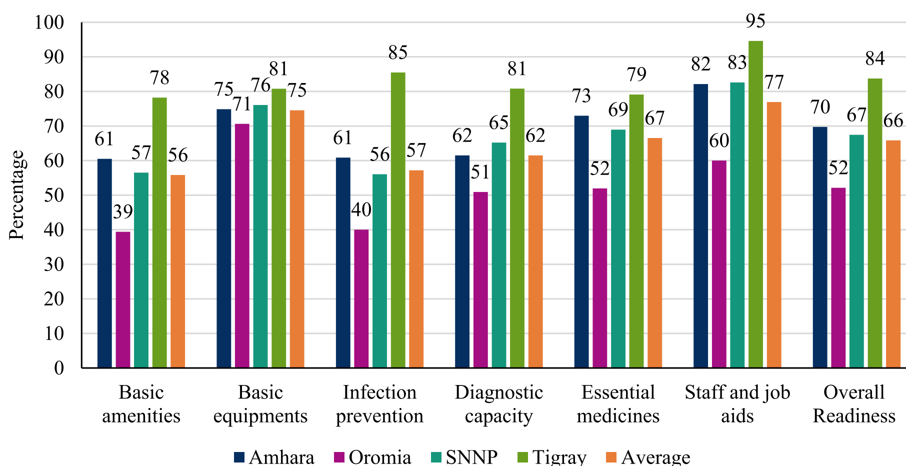

Fig. 11 Readiness status of health posts in Ethiopia by component and region

availability of these basic amenities is 46%, with the highest availability in the Tigray region at 62% and the lowest availability in Oromia region health posts at 30%. There are significant variations in the availability of these infrastructures across regions. This finding aligns with the national assessment, showing that health posts in our study have better access to water supply and latrine facilities compared to national surveys [23, 24]. The lack of basic infrastructure is common issue in low and middle-income settings, globally, which hinders efforts towards providing quality care [25–27].

On average, five out of seven essential medicines were available at health posts in the four regions. Only one-tenth of the health posts had all essential medicines and 59% had half or more of the required medicines. The mean percentage availability of these essential medicines was 66%, with the highest availability in Tigray region health posts (79%) followed by Amhara region health posts (73%). According to WHO criteria, the availability of essential medicines for children at the studied health posts was fairly high [22].

Of the essential medicines according to the standards of health posts, zinc and amoxicillin were available in more than three-fourths of the health posts. In contrast, paracetamol and ORS were available in more than two-thirds of the health posts. These findings were better than the national assessment [24]. The other essential medicines, including coartem, and cotrimoxazole were available in three-fifth, and one-third of the health posts, respectively. In some health posts, essential medicines were never available, and expiry dates of medicines ranged on average from 2 to 5 months. The availability of essential drugs was lower than a study conducted in Sub-Saharan African countries, where 74% of the health facilities had critical community case management drugs [28]. A study conducted in Tanzania also showed better

performance in the availability of critical CCM medicines [28]. Shortage of essential commodities at the health post level results in sub-optimal curative care at the community level and affects the effort towards reducing child morbidity and mortality [29].

Further, on average, four out of six basic equipment's used for child healthcare were available and a bit greater than one-fifth (23%) of the health posts had all of these essential equipment's. The average percentage availability of basic childcare equipment was 75%, with the highest availability found in Tigray region health posts at 81%, followed by SNNP region health posts at 76%. The most commonly available medical equipment and supplies at health posts were MUAC tape measures, thermometers, infant scales, and stethoscopes. These items were available in over three-fourths of the health posts, with availability ranging from 77 to 99%. The availability of MUAC tape and thermometers was comparable to the findings from the assessment in SSA countries. In contrast, the availability of malaria RDT was lower than reported in the same study (62% vs. 86%) [28] and a study conducted in Tanzania [28]. There was no significant difference in the availability of medical equipment and malaria diagnostic tests at the health posts across regions. Contrary to the findings of the recent national assessment, our study revealed that a greater percentage of health posts were equipped with essential childcare equipment. This equipment included MUAC tape, an infant scale, and a stethoscope [23].

Infection prevention is an essential aspect of providing quality care at health facilities. Most health posts in the four regions had sharps containers and clean gloves; however, less than half had chlorine solution, containers for contaminated waste, alcohol-based hand rubs, soap, and towels. This finding aligns with the results of national assessment [30].

Job aids are crucial for providing curative care at the health post level. The current study revealed that most health posts had chart booklets and registration book for sick children aged 0- < 2 months and 2–59 months. A similar level of job aid availability was found in a study conducted in Tanzania, where IMCI job aids were reported to be available 93% of the time [28]. However, the availability of iCCM medicine request forms, resupply forms, and stock card/bin cards was lower in the health posts across the four regions. The study also found that the availability of job aids varied significantly among the health posts studied across the four regions.

In the regions, health posts typically had at least two health extension workers, following the standard of 2 health extension workers per health post or 5000 population in Ethiopia [31]. The number of health extension workers available varied between 1 to 3 at different health posts. While most health extension workers had received iCCM/clinical training, only a few had been trained in the past 12 months leading up to the survey. This lack of recent training could lead to a decline in knowledge and potentially impact the performance of health extension workers.

Supportive supervision following initial clinical training was effective in improving the competency of health extension workers and contributed to the improvement of health system performance [32–35]. A high-quality supervision that focuses on supportive approaches, community monitoring, and problem-solving is most effective [36] and helps to sustain community health workers' performance [37]. In the current study, supportive supervision was provided to at least three-fourths of the health extension workers, with most of the supervision coming from health centers. Supervision at health posts was often uncoordinated, with different organizations or teams only coordinating in a few instances. Additionally, supervisors discussed the clinical management of common childhood illnesses in less than seven out of ten contacts, and observed child consultations with health extension workers in slightly over half of their supervisions. Written feedback was included in 71% of the contacts during supportive supervision. There were variations in content and approach among the supervisions, which has significant implications for the performance of health extension workers and the quality of curative care for children. Supervisions focusing on observing child consultations are crucial for improving performance.

Performance reviews and clinical mentoring meetings help improve the performance of health extension workers in delivering curative care [38]. Mentorships serve to bridge the gaps between knowledge and quality clinical practices, addressing deficiencies in the health system that hinder health workers from providing quality care [39]. In the four regions, fewer than half of the health extension workers have participated in the performance review and clinical mentoring meetings held every six months as recommended by the national guideline [40].

Quality in healthcare organizations depends on a solid system design, consistent long-term direction, adequate training, leadership, and follow-up. In addition to deploying the intended health workforce, continuous development of the knowledge and skills of health workers is essential for quality improvement [2]. Community health workers who are adequately supported can play important roles in resolving access challenges and preventing maternal, newborn, and child deaths [41, 42]. The performance of community health workers is influenced by various factors, such as continuous training, transport support, adequate supervision, motivation, and regular drug supply. Introducing financial incentives and

remunerations can also help improve their performance [43, 44].

The research was conducted in four regions of Ethiopia, and validated tools were applied. Various data collection methods were used, including facility assessment supplemented with observations, interviews, and record review. The study districts were purposefully selected for the planned effectiveness evaluation and may not represent all districts in the regions. However, these districts are typical of the average situation in most rural areas of these regions.

Conclusions

Our study revealed that a low proportion of health posts were prepared to provide quality care for sick child when assessed using readiness components. There was variation in the readiness of health posts to deliver quality child health care in four regions of Ethiopia. Few health extension workers had received updated clinical training, follow-up supervision and mentorship. Most health posts lacked critical infrastructure, medicines, medical equipment, and supplies necessary to provide quality curative care to children; on average, medicines experienced stockouts for 2 to 5 months.

The findings have implications for the clinical practices of health extension workers. While the health extension program is a proven intervention that contributes to positive impacts, allowing health extension workers to provide curative care to children without adequate readiness will lead to poor outcomes. Therefore, the government should prioritize maintaining and securing the availability of infrastructure, medicines, medical equipment, and job aids to meet the standard level. The potential benefits of community-based child curative care can only be realized by addressing these gaps.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-025-12279-7.

Supplementary Material 1.

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Patient and public involvement

Patients and/or the public were not involved in the design or conduct or reporting or dissemination plans of this research.

Authors' contributions

All authors conceived the study, participated in data collectors' training and supervision, and analysed and interpreted the data. DWD prepared the first draft of the manuscript with contributions from MW. All authors read, revised, and approved the final version.

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Data availability

Study data is available with the corresponding author (E-mail: dawit.daka86520@gmail.com or dawit.daka@ju.edu.et). The use of these data is guided by a data sharing agreement that states that data will be made available upon reasonable request. Currently, data are private because data used in this paper is part of the successive student research project.

Declarations

Ethics approval and consent to participate

Research ethical clearance was secured from the ethical review committees at the Ethiopian Public Health Institute (protocol number SERO-012–8- 2016; 001 August 2016), London School of Hygiene & Tropical Medicine (protocol number 11235, June 2016), and Institute of Health in Jimma University, Ethiopia (Ref no. IHRPGD/472/2018, August 2018). The four Regional Health Bureau and respective zone administrations provided the study permission letter. All methods were carried out following the relevant guidelines and regulations. Informed consent was taken from the study participants. At the beginning of each interview, the purpose of the study was explained, and the participants were asked if they had any questions. Interviews were conducted in private rooms to ensure confidentiality, and names or personal identifiers were not used. Access to data was restricted to authorized research staff.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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