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Availability of Lifesaving Maternal and Child Health Commodities and Associated Factors in Public and Private Health Facilities of Addis Ababa, Ethiopia

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Abstract

Background: Inaccessible, unaffordable, and poor quality care are the key underlying reasons for the high burden of maternal and child morbidity and mortality in low- and middle-income countries.

Objective: To assess the availability of lifesaving maternal and child health (MCH) commodities and associated factors in public and private health facilities of Addis Ababa, Ethiopia, 2016.

Methods: Institutional-based, descriptive cross-sectional study was carried out in the selected health facilities (29 publics and 6 private) in Addis Ababa. The data were collected through pretested, structured questionnaire, and in-depth interviews. For the quantitative analysis, data were analyzed using SPSS version 20 statistical software, SPSS Inc. Descriptive statistics were used to summarize the variables, and the Spearman correlation test was run to determine the predictors of the outcome variables. For the qualitative data, the data were handled manually and transformed into categories related to the topics and coded on paper individually in order to identify themes and patterns for thematic analysis.

Result: The overall availability of the lifesaving MCH commodities in the health facilities was 74.3%. There is a moderate, positive association between the availability of lifesaving MCH commodities with the adequacy of budget ($r_s = 0.485$, $P < .001$), use of more than 1 selection criteria during selection ($r_s = 0.407$, $P = .015$), and training given to health facilities on logistics management ($r_s = 0.490$, $P = .003$).

Conclusion: The availability of the lifesaving MCH commodities in the health facilities was within the range of fairly high to high. Adequacy of budget, use of more than 1 selection criteria during selection, and training given on logistics management were the predictors of the availability of the commodities.

Keywords

cost-effectiveness, medical cost, medications, pharmacy, community health

Introduction

One-third of the world population does not get regular access to vital medicines and in some of the developing countries in Africa and Asia, more than half of the population has no regular access to essential medicine.[1]

Maternal and neonatal mortality rates in Ethiopia are among the highest in the world despite the achievement of Millennium Development Goal 4.[2] The maternal mortality rate (MMR) of Ethiopia in 2015 is 420 deaths per 100 000 live births. The neonatal mortality rate of Ethiopia in 2015 is 28 per 1000 live births. Ethiopia aims to reduce the MMR to 199 per 100 000 live births and neonatal, infant, and younger than5 mortality

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rate to 10, 20, and 30, respectively, by 2020 as indicated in the health sector transformation plan.[3]

The availability of essential medicines is the construct of the components of the pharmaceutical logistics system (selection, quantification, procurement, and distribution), and failure in 1 part of the system leads to the failure of the whole pharmaceutical management process. Inaccessible, unaffordable, and the poor quality of care is the critical factor for the high burden of maternal and child morbidity and mortality in low-income countries.[4]

In the health sector, an effective supply chain management will contribute considerably to the constant availability of pharmaceuticals, more so lifesaving maternal and child health (MCH) pharmaceuticals in particular, which are important items in health service delivery.[5]

Findings from developing countries suggest that in addition to the problem of health system and financial barriers for both governments and end users, 3 main types of obstacles prevent women and children from getting and using proper supplies: the insufficient supply of high-quality health commodities, the inability to effectively regulate these quality commodities, and the absence of access and awareness of how, why, and when to use them, resulting in limited demand.[4]

Despite the strong evidence that shows health impact and lives saved, too often the lifesaving commodities are out of reach for those individuals who need them most. Across low-income countries, just a third to half of the children received essential drugs to treat childhood diarrhea and pneumonia.[6]

Studies conducted in different parts of Ethiopia[7-9] and across the globe (China, Guatemala, Uganda, and Kenya)[10-17] showed that the availability of lifesaving MCH commodities effectively addresses the avoidable causes of death during pregnancy and childbirth.

Most of the studies used quantitative assessments and there was no previously done research in the study area, so the findings of this study will serve as the baseline for the study area, which intend to fill some of the gaps of previously done literature in other parts of Ethiopia, and will help to identify the gaps in order to determine evidence-based intervention.

This study aimed to assess the availability and associated factors of lifesaving MCH commodities in both public and private health facilities in Addis Ababa.

Method and Material

Study Area and Period

Addis Ababa is the capital city of Ethiopia. The city is administratively subdivided into 10 subcities.[18] There are 84 Health Centers, 11 public hospitals, and 33 private hospitals. The public health facility to population ratio in the city is 218 200 per HC and 297 546 per public hospital.[19] Only 7 public and 24 private hospitals were providing basic MCH service, respectively. The study was undertaken from April to May 2016.

Study Design

A institutional-based cross-sectional descriptive study design was carried out using both quantitative and qualitative research methods.

Population

Source of population. All health facilities in Addis Ababa providing MCH service and all health professionals were involved in the logistics management of health commodities in those facilities.

Study population. Eligible health facilities in Addis Ababa providing MCH services and professionals were responsible for the logistics management of lifesaving MCH commodities in those facilities.

Eligibility Criteria

Inclusion criteria.

- Public health facilities in Addis Ababa providing MCH services.
- Private hospitals in Addis Ababa providing MCH services.
- Professionals involved in the logistics management of MCH commodities.

Exclusion criteria.

- Health facilities who start providing MCH service less than 6 months ago.

Sample Size Determination and Sampling Procedure

Sample size determination. The sample size was determined by using the single population proportion formula.[20]

$$n = \frac{(Z_{\alpha/2})^2 P \times (1-p)}{d^2}$$

where n is the sample size, $Z_{\alpha/2}$ represents the confidence level of 1.96, P is the estimated prevalence of 50% (0.5), d is the margin of error of 0.15 (15%).

Therefore, the value of n is calculated as follows:

$$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.15)^2} = 42.68, \text{ which is approximately } 43.$$

Since there was a predetermined population, the sample size generated from the above equation was multiplied by the finite population correction factor.[20]

$$\text{New } n = \frac{n}{1 + [(n-1)/N]}$$

where New n is the adjusted new sample size, N is the population size of 115, n is the sample size obtained from the general formula.

$$\text{New } n = \frac{43}{1 + [(43 - 1)/115]} = 32$$

Based on World Health Organization (WHO) service availability and readiness assessment tool recommendation, all the public hospitals in Addis Ababa which were providing basic MCH services were included in the study.[21] Therefore, the estimated sample size was 37.

Sampling technique and procedures. A stratified random sampling technique was used to select the study participants. The study population was divided into 3 strata, namely HCs (23) of 84, public hospitals (7) of 7, and private hospitals (7) of 24 based on the proportion of health facilities. From the 2 strata (HCs and private hospitals), appropriate samples were selected. The health facilities were selected by simple random sampling technique whereby in each stratum, all facilities (sampling frame) were assigned numbers from 1 to the last number of facilities on a piece of paper. From each facility, the pharmacy head and store manager were contacted to collect both the quantitative and qualitative data.

Data collection procedures and instruments. Quantitative data were collected using pretested, structured interview and observation checklist. The tools were adapted from Logistics Indicator Assessment Tool, Logistics System Assessment Tool, and indicators developed by John Snow, Inc for UNCoLSC.[22-24] Massachusetts, Boston. The data were collected from both the pharmacy head and store manager of the health facility. The quantitative data collection at health facilities was done by 2 trained data collectors. The overall data collection process was closely supervised by the principal investigator. A structured interview was used to collect the data on the health system, health facility, and capacity-related factors.

For the qualitative part of the study, a semistructured face-to-face in-depth interview guide was used to collect the data on barriers hindering the availability of the commodities from the pharmacy heads. The in-depth interview was conducted by the principal investigator.

Data processing, analysis, interpretation, and presentation. Descriptive statistics were done to summarize the dependent and independent variables. The χ^2 test was run to determine the association of availability of the commodities with the independent variables, and Spearman rank correlation tests were run to determine the predictors of availability of lifesaving MCH commodities. P value of $<.05$ was considered statistically significant in both tests. The assumptions for Spearman correlation analysis such as the data to be interval or ratio level or ordinal and the 2 variables are monotonically related met during the analysis. The availability index of WHO was used to categorize the availability of the commodities from very low to high range.[25] Whereas for the determination of the predictors of the availability of the commodities, the national monitoring and evaluation framework where health facilities are expected to stock $\geq$80 of the commodities was used to categorize the health facilities.[26]

The qualitative data were handled manually and transformed into categories related to the topics that were discussed and coded on paper individually in order to identify themes and patterns for thematic analysis.

Operational definitions of concepts and standard terms

- Lifesaving MCH commodities—the 13 commodities identified by UNCoLSC as overlooked MCH commodities. These are oxytocin, misoprostol, magnesium sulfate, implants (Jadelle and Implanon), emergency contraceptive, female condom, dexamethasone injection, injectable antibiotics (ampicillin and gentamycin injections), neonatal resuscitation device, zinc, oral rehydration salt (ORS), and amoxicillin dispersible tablets.
- Availability—A product is said to be available if it is available in the health facility providing MCH service on the day of the visit.

The following ranges were used for describing availability:

- <30%—very low,
- 30% to 49%—low,
- 50% to 80%—fairly high,
- >80%—high[25]

Ethical consideration. Before commencing data collection, ethical approval was obtained from the Ethics Review Committee of the College of Health Science, Jimma University. Subsequent permission was obtained from the Addis Ababa city administration health bureau. Then, the selected health facilities were communicated with a formal letter from Jimma University.

Participants of the study were asked for verbal consent before participating in the study. During the consent process, they were provided with information about the study and ethical issues. Participants were also assured about the confidentiality of the information obtained in the course of the study by not using personal identifiers and analyzing the data in aggregates.

Concerning the in-depth interviews, interviews were recorded on a digital voice recorder after interviewees gave informed consent. The name of the interviewees and the health facility in which they work were not included in data analysis, and interviewees were assured that the information they provide is only to be handled by the research team and that it will not be discussed with the health facility administrators or other study participants.

Results

Availability of Lifesaving MCH Commodities

Among the MCH products identified, oxytocin and ORS were available in 34 (97.1%) of the health facilities on the day of the visit. However, chlorhexidine gel, amoxicillin 250 mg

Table 1. Availability of Lifesaving MCH Commodities at Selected Public and Private Health Facilities of Addis Ababa City, Ethiopia, May 2016.

Name of the Commodities	Availability at Health Facilities, N (%)	WHO Availability Index
Oral rehydration salt	34 (97.1)	High
Zinc 20 mg dispersible tablet	19 (54.3)	Fairly high
Amoxicillin 250 mg dispersible tablet	0	Very low
Dexamethasone phosphate 4 mg/mL injection	32 (91.4)	High
Chlorhexidine 21 g gel	0	Very low
Neonatal resuscitation device	33 (94.3)	High
Gentamycin sulphate 40 mg/mL in 1 mL Injection	26 (74.3)	Fairly high
Ampicillin 250 or 500 mg powder for injection	29 (82.9)	High
Levonorgestrel 75 mg (Jadelle)	28 (90.3)	High
Etonogestrel 68 mg (Implanon)	27 (87.1)	High
Female condom	0	Very low
Levonorgestrel 0.75 mg (emergency contraceptive)	28 (90.3)	High
Oxytocin 10 U/mL Injection	34 (97.1)	High
Misoprostol 200 μg tablet	8 (22.9)	Very low
Magnesium sulphate 50% in 20 mL—injection	17 (48.6)	Low

Abbreviations: MCH, maternal and child health; WHO, World Health Organization.

dispersible tablet, and a female condom were not available in any of the health facilities during the study time. Jadelle, Implanon, and emergency contraceptives were available in 28 (90.3%), 27 (87.1%), and 28 (90.3%) of the health facilities, respectively (Table 1).

Organizational Support

Budget and availability of SOPs. Adequacy of the budget was not an issue for the private hospitals where all of them responded that an adequate budget was allocated for the procurement of the commodities. However, only 12 (41.4%) of the 29 public health facilities reported that the budget was adequate to avail the commodities.

Number of staffs. The average number of druggists, pharmacists with first degree (BPharm) and pharmacists with MSc in the studied facilities were 3.23, 6.31, and 0.17, respectively. The number of druggists was higher in HCs, whereas pharmacists with first and second degrees were higher in public hospitals. The maximum number of pharmacists exhibited was 38 in 1 of the public hospitals. However, private hospitals showed the lowest number of staffs in each pharmacy profession.

Supportive supervision and training. All the private hospitals indicated that they have never received supportive supervision (SS) on medicine logistics management until the time of the study. All the public health facilities stated they had received SS that covers logistics activities with 20 (69.1%) of them confirming its regularity. The City Administration Health Bureau and Sub-City Health Offices were the major providers of SS. Both of them providing for 18 (62.1%) of the public health facilities under them, while 1 public health facility received from MOH (Figure 1).

Regarding training given to staff involved in logistics management, 27 (77.1%) of them have received training on proper storage of health products, whereas none of the staff in these facilities have received any training focused on lifesaving MCH products, unlike other programs.

Budget. The inadequacy of budget was mentioned by key informants (KIs) as a significant challenge for performing logistics management activities in public health facilities. Some of the KIs mentioned that they try to give priority for the procurement of MCH products in case of budget shortage. They also mentioned that the government was pushing them to give delivery service for free to the public but the program products were not available at Pharmaceuticals Fund and Supply Agency (PFSA) and the facilities were utilizing the products they purchased with their budget which eventually leads to a shortage of budget. One of the KIs said that;

> The budget allocated for procurement of pharmaceuticals is low and we utilize commodities purchased for other services not to interrupt the delivery service which the government is pushing us to give freely without making the products available to us. This process will lead us to the lack of budget.

Capacity-Building Activities

Training. The KIs mentioned that no training has been given for the pharmacy staff on the lifesaving MCH products, including their logistics management, unlike other programs. One KI said

> I have received ART training 4 times but never received any training on MCH products during my stay in this facility.

The following areas were identified by KIs for building the capacity of pharmacy staffs to improve the logistics management practice of MCH commodities: (1) MCH programs, (2) the use of the lifesaving MCH products and treatment options, (3) forecasting (quantification training), (4) rational medicine use, (5) store management and health commodity management information system, and (6) clinical pharmacy service.

Most of the KIs agreed with the idea that having a staff with proper logistics management knowledge and experience will have an impact on improving the availability of the lifesaving MCH commodities.

Supportive supervision. The majority of the KIs mentioned that SS and close government follow-up will have an impact on improving the availability of the lifesaving MCH commodities. They stated that the SS would help them to know their strengths and weakness so that they will work to correct their faults as per the feedback. On the contrary to most of the KIs, one KI said:

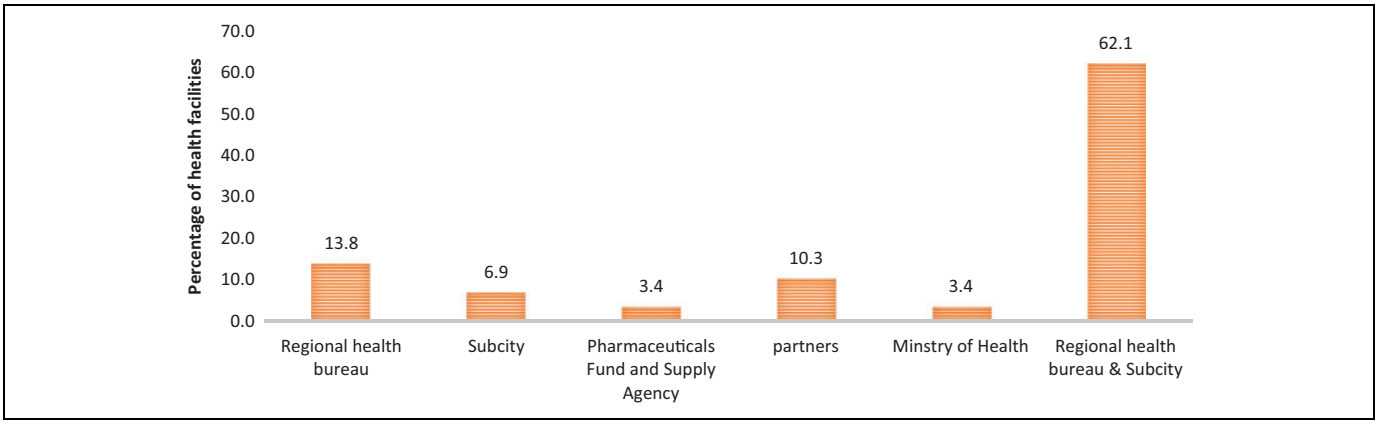

Figure 1. Supportive supervision providers for public health facilities in Addis Ababa City, Ethiopia, May 2016.

> The SS will not have an impact, the only thing that matters is the availability of the products at PFSA. Since they don't supply us the products, it will not bring any outcome for us.

Barriers in the availability of the lifesaving MCH commodities. The majority of the KIs rated the availability of the lifesaving MCH commodities at their facility as good for which they were giving service and agreed that the availability of the commodities at their facility should be improved to give quality service to clients. One KI mentioned that

> If the product is available in the country, we avail it by taking all the necessary measures. We face stockout when it is not available in the country as a whole.

Regarding the availability of the products from PFSA and private wholesalers for resupply and procurement, the KIs agreed that there was low availability of the products at PFSA, while the availability of the products at the private suppliers (wholesalers) was relatively good.

The significant barriers identified by the KIs affecting the availability of the commodities were stockout of the products at PFSA, unavailability of the products in the market, and the supply of products from PFSA with short expiry and inadequacy of budget.

Predictors of availability of lifesaving MCH commodities. A χ^2 test was run to determine the association between the availability of lifesaving MCH commodities with the independent variables. As shown in Table 2, availability of facility-specific essential medicine list ($P = .02$), using adopting from the National Essential Medicine List (NEML) as selection criteria ($P = .026$), developing forecast using dispensed to user data ($P = .031$), adequacy of budget ($P = .005$), and training on estimating annual needs ($P = .013$) have shown association with availability of lifesaving MCH commodities (Table 2).

There is a moderate, positive association between the availability of lifesaving MCH commodities with adequacy of budget ($r_s = 0.485$, $P < .001$), use of more than 1 selection criteria during selection ($r_s = 0.407$, $P = .015$), and training provided to health facilities on logistics management ($r_s = 0.490$, $P = .003$; Table 3).

Discussion

Availability of the Lifesaving MCH Commodities

In this study, it was found that the availability of the lifesaving MCH commodities in the health facilities was within the range of fairly high to high except for misoprostol which was very low.

Maternal health commodities. Oxytocin, misoprostol, and magnesium sulfate were available in 97.1%, 22.9%, and 63% of the health facilities, respectively. The availability of oxytocin and misoprostol was nearly similar to the finding of the study done in the Amhara region (Ethiopia), which is 100% and 39.1%, whereas magnesium sulfate was not available.[7] The high availability of oxytocin in the 2 findings might be due to the incorporation of the commodity in Integrated Pharmaceuticals Logistics System (IPLS). A national baseline survey revealed that oxytocin was available in 78.86% of the health facilities which is lower than the findings of the current study and magnesium sulfate was available in 18.59% of the health facilities which is far lower than the findings of the current study.[9]

Reproductive health commodities. This study revealed that contraceptive implants, Jadelle, and Implanon were available in 90.2%, 93.3%, and 87.1% of the health facilities, respectively, which are lower than the national survey data where the availability of implants was 100%.[27] The disparity in the availability might be caused by the fact that the national survey carried on public hospitals which provides family planning service free to the public where the chance of follow-up and SS is high for those products as evidenced by the qualitative finding, and the availability of one of the commodities in the health facilities was considered to say implant was available in the other study.

The emergency contraceptive was available in 87.5% of the health facilities which is slightly lower than a national survey data 93.94%.[27] However, the finding is higher when compared with a similar survey done nationally and in Amhara region

Table 2. Chi-Square Test for Determination of Association of Availability of Lifesaving MCH Commodities With the Independent Variables at Selected Public and Private Health Facilities of Addis Ababa City, Ethiopia, May 2016.

Independent Variables	Availability of Lifesaving MCH Commodities: χ^2 value (*df*, N)	*P* Value
Selection		
Documented guideline for medicine selection	0.117 (1, 35)	.732
Availability of facility specific EML	**5.387 (1, 35)**	**.02**[a]
Availability of NEML	1.247 (1, 35)	1
Who performs the selection	2.247 (2, 35)	.325
Selection criteria (pattern of prevalent disease)	0.033 (1, 35)	1
Selection criteria (efficacy and safety)	0.013 (1, 35)	1
Selection criteria (cost of the drug)	0.149 (1, 35)	.699
Selection criteria (preference for well-known drugs)	0.168 (1, 35)	.682
Selection criteria (adopt from the NEML)	**4.950 (1, 35)**	**.026**[a]
Forecasting		
Who initiates forecasting	2.788 (2, 35)	.248
Forecasts developed using dispensed to user data	**4.667 (1, 35)**	**.031**[a]
Forecasts developed using issue data	No value (constant)	
Forecasts developed using stock on hand data	1.601 (1, 35)	.457
Forecasts developed using demographic data	3.439 (1, 35)	.064
Forecasts developed using service statistics	0.103 (1, 35)	1
Validation of annual forecast with annual consumption	0.029 (1, 35)	1
Technical assistance provided during forecasting	0.596 (1, 35)	.440
Procurement		
Responsible person for procurement planning and ordering	4.035 (4, 35)	.401
Having pharmacist as a member of tender committee	0.459 (1, 35)	.677
Who determines the facilities' resupply quantities	No value (constant)	
How are the facility's resupply/order quantities determined	1.601 (1, 35)	.457
Lead time of program MCH products from PFSA	1.742 (1, 35)	.299
Lead time of budget MCH products from PFSA	No value (constant)	
Lead time of budget MCH products from private suppliers	0.336 (1, 35)	.562
LMIS		
Usage of stock card	0.708 (1, 29)	.454
Usage of bin card	2.499 (1, 29)	.488
Automated information system	0.708 (1, 29)	.454
Inventory management		
Guidelines and established procedures for maximum and minimum stock level	2.545 (1, 35)	.489
Inventory control guidelines applied and stock level generally fall between minimum and maximum	3.067 (1, 35)	.08
Stock level for products reviewed periodically	1.152 (1, 35)	.283
Policy of storing and issuing stock according to FEFO	1.601 (1, 35)	.457
Written guideline for storage and handling of all products	0.053 (1, 35)	1
Storage capacity adequate to handle the current quantities of products	0.266 (1, 35)	.606
The storage capacity handles all the quantities needed to ensure that no stockout occurs	0.426 (1, 35)	.514
Visual inspection of products	0.479 (1, 35)	.642
Written procedure or guideline for the disposal of damaged and expired products	0.009 (1, 35)	.923
Budget		
Adequacy of budget	**8.006 (1, 35)**	**.005**[a]
Capacity in logistics management activities		
Training on proper storage of health products	3.848 (1, 35)	.096
Training on maintaining proper stock level	3.848 (1, 35)	.096
Training on determining order quantities	3.848 (1, 35)	.096
Training on determining issue quantities	3.848 (1, 35)	.096
Training on estimating annual needs	**6.122 (1, 35)**	**.013**[a]
Training on reviewing reports and records	3.848 (1, 35)	.096
Supportive supervision		
SS that cover logistics activities	0.052 (1, 35)	.82

Abbreviations: EML, essential medicine list; FEFO: First Expired, First Out; LMIS: Logistics Management and Information System; MCH, maternal and child health; NEML, National Essential Medicine List; PFSA: Pharmaceuticals Fund and Supply Agency; SS, supportive supervision.

[a]Variables that showed association with the availability of lifesaving MCH commodities. Variables that showed association with the outcome variable.

where emergency contraceptives were available in 64.8% and 50% of the health facilities, respectively.[7,28]

Child health commodities. Regarding the child health commodities, the availability of ORS (97.1%) in this study is almost similar to a national survey data which is 96.97%[27] and higher than a study done in East Wollega (Ethiopia) with 40% and 80% availability in public and private drug outlets, respectively.[29] The difference in the finding of the 2 studies might be due to delay in resupply, lack of regular SS, and government follow-up. A study done in Uganda reported that ORS was available in all the HC IIs and IIIs but in only 60% of the HC IVs.

This study revealed that zinc was available in 73.1% of the health facilities which is slightly higher than a study done in East Wollega where zinc is available at 66.7% of the public

Table 3. Spearman Correlation Rank Test for Predictors of Availability of Lifesaving MCH Commodities at Selected Public and Private Health Facilities of Addis Ababa City, Ethiopia, May 2016.

Independent Variables	Availability of Lifesaving MCH Commodities
Spearman ρ	
Adequacy of budget to avail MCH products	
Correlation coefficient	**0.485**[a]
Significance (2 tailed)	**0.003**
N	35
Use of selection criteria	
Correlation coefficient	**0.407**[b]
Significance (2 tailed)	**0.015**
N	35
Use of forecasting data	
Correlation coefficient	0.022
Significance (2 tailed)	0.902
N	35
Training given to the health facilities on logistics management	
Correlation coefficient	**0.490**[a]
Significance (2 tailed)	**0.003**
N	35
Number of pharmacy professionals in the health facility	
Correlation coefficient	0.236
Significance (2 tailed)	0.173
N	35

Abbreviation: MCH, maternal and child health.
[a]Correlation is significant at the 0.01 level.
[b]Correlation is significant at the 0.05 level.

drug outlets and none of the private drug outlets.[29] This result may be due to the supply of zinc by private wholesalers in Addis Ababa and both types of health facilities can purchase zinc from private suppliers as compared to East Wollega, where zinc being a program pharmaceutical distributed by PFSA to public health facilities only.

Amoxicillin dispersible tablet, the first-line treatment for pneumonia among younger than 5-year-old children as per WHO recommendation, was not available and access to it was not given by any of the health facilities included in the study.[30,31] According to United Nations Children's Fund/ United Nations International Children's Emergency Fund (UNICEF), more than 1.5 million lives of children could be saved if amoxicillin was available in the health facilities.[4] A national survey data indicated that amoxicillin dispersible tablet was not available at any of the health facilities in the study.[27] In contrary to this study, a study done in Uganda revealed that amoxicillin dispersible tablet was available in 30% and 40% of the HC IIs and IVs surveyed, respectively, but absent in all the HC IIIs similar to this study.[12]

Neonatal health commodities. Despite WHO recommendation of chlorhexidine gel for umbilical cord care for newborns, it was not available at any of the health facility which was similar to the finding of a national survey.[27] This result might be due to the noninclusion of the commodity in both the NEML and standard treatment guideline, nonavailability of supplier, and lack of information on the product as evidenced by the qualitative finding.[32-34]

Dexamethasone injection was available in 91.4% of the health facilities which was a little bit higher than findings of the national survey stating 84.9%.[27]

Gentamycin injection was available in 74.3% of the health facilities, which is far higher than a study that was done in East Wollega (Ethiopia), where gentamycin was not available in any of the health facilities in the study.[29] This result might be due to a lack of awareness of the indication of gentamycin for neonatal sepsis. A national survey also indicated that benzylpenicillin or gentamycin was available at 100% of the hospitals which is higher than the finding of this study.[27]

Predictors of Availability of Lifesaving MCH Commodities

This study found that there was an association between the availability of lifesaving MCH commodities with the availability of facility-specific medicine list ($P = .02$) and adopting the list from the national medicine list ($P = .026$). As the number of selection criteria increases, there is an improvement in the availability of the commodities with a moderate positive association ($r_s = 0.407$, $P = .015$). This outcome is supported by a study done in Kenya, where an inappropriate selection was leading health facilities to stockout of essential medicines.[16]

There is also an association between the availability of lifesaving MCH commodities and using dispensed to user data during forecasting ($P = .031$). This result is supported by 2 studies done in Uganda where quantification affects the availability of essential medicines ($P < .001$).[13,14]

This study also found that there is a moderate positive association between the availability of lifesaving MCH commodities and adequacy of budget ($r_s = 0.485$, $P = .003$). This result is in line with research that was done in Uganda, where the availability of funds is a predictor of the availability of essential medicines ($P < .001$).[14] The KIs from this study stated that inadequacy of budget affects the availability of the lifesaving MCH commodities which is in line with 2 studies done in Kenya and Uganda where insufficient funding was found to affect the availability of essential medicines.[13,16]

Conclusion

The availability of the lifesaving MCH commodities in the health facilities was within the range of fairly high to high with the except for misoprostol, which was very low. Stockout of the products at PFSA, unavailability of the products in the market, the supply of products from PFSA with short expiry, and inadequacy of budget were found to be the barriers in the availability of the commodities. This study also found adequacy of budget, use of selection criteria, and the training on logistics management were predictors of the availability of the commodities.

Limitations of the Study

- This study did not address all components of the logistics system such as distribution and drug use.
- The findings of this study were from only a health facility perspective and did not include other stakeholders such as suppliers.
- The study is cross-sectional by nature, which does not show the cause–effect relationship between the outcome variable and explanatory variables.

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