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Quality of Prevention of Mother to Child Transmission (PMTCT) of HIV Services in Public Hospitals of Hadiya Zone, Southern Ethiopia

Bahailu Balcha Bachore^{1*}, Fikru Tafese², Feyera Gebissa² and Dejene Ermias Mekango³

¹School of Public Health, College of Medicine and Health Sciences, Woliata Sodo University, Sodo, Ethiopia

²Department of Health Economics, Management, and Policy, Faculty of Public Health, Institute of Health, Jimma University, Jimma, Ethiopia

³Department of Public Health, College of Medicine and Health Sciences, Wachemo University, Hosanna, Ethiopia

*Corresponding author: Bahailu Balcha Bachore, School of Public Health, College of Medicine and Health Sciences, Woliata Sodo University, Sodo, Ethiopia, Tel: +251-9-13-09-9174; E-mail: behailubalcha2@gmail.com

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Abstract

Background: Prevention of mother-to-child transmission describes a comprehensive package of services intended to reduce mother-to-child transmission of HIV. Transmission of HIV from mother to child accounts for more than 90% of pediatric Acquired Immunodeficiency Syndrome (AIDS). Few studies examining the quality of PMTCT services provision in Ethiopia are available. Therefore, this study aimed to assess the quality of PMTCT services in public hospitals of Hadiya zone, southern Ethiopia.

Methods: Institution based cross-sectional study design using both quantitative and qualitative methods was conducted in public hospitals from March 1 to April 10, 2017. A total of 423 pregnant women were consecutively interviewed at three hospitals. Service provision processes were observed for 21 counseling sessions and nine in-depth interviews were conducted with health care providers, medical director and mothers' support group. Additionally, resource inventory was done. Donabedian's Structure-Process-Outcome model was used to assess the quality of PMTCT service at respective study area. Data was analyzed using SPSS 20. Binary and multivariate logistic regressions were computed. The qualitative data were analyzed manually using thematic analysis method to support quantitative result through triangulation.

Result: Most of the minimum required resources such as test kits, ARV drugs and other supplies were available in hospitals studied. However, inadequate of trained human resource was observed. About 89.8% clients were satisfied with PMTCT services provided at public hospitals. The client satisfaction with PMTCT services were associated with waiting time [AOR=4.6, 95% CI; 2.18, 9.89], counseling time [AOR=3.7, 95% CI; 1.64, 8.54] and

counseling given by same counselor before and after HIV test [AOR=0.2, 95% CI; 0.09, 0.41].

Discussion: Although clients' satisfaction by PMTCT service is very high. Availability of necessary resource and compliance of health care providers to national guideline need improvement. More efforts to be exerted on improving providers' compliance with national PMTCT guideline, consistent supply of necessary resources to improve quality of PMTCT services.

Keywords: HIV; Ethiopia; Prevention; Women; PMTCT

Introduction

Human immunodeficiency virus has devastated Africa. Over 25 million or 69% of global HIV cases are in Africa [1]. Of the 3.2 million children living with HIV in 2014, 91% live in sub-Saharan Africa and 85% of HIV-positive pregnant women also live in the region [2].

Mother-to-child transmission (MTCT) of human immunodeficiency virus (HIV) entails transmission of HIV from an infected mother to her child. Also called "vertical" or "perinatal" transmission, MTCT can occur during pregnancy, labor, delivery, and breastfeeding [3]. Over 90% of pediatric AIDS cases are from MTCT [4]. Globally, 150,000 children acquire HIV annually [5], of which 83% is in Africa [6].

Prevention of maternal to child transmission of HIV (PMTCT) is an intervention/set of interventions to ensure that no child is born with HIV. PMTCT includes medicine, counseling and psychological support [7]. In the absence of any intervention, transmission rates range from 15% to 45% [8].

PMTCT has four components: 1) primary prevention of HIV infection, 2) prevention of unintended pregnancies among HIV-positive women, 3) prevention of HIV transmission from women infected to their infants through treatment and care

and 4) support to women infected with HIV, their infants and their families [9].

Coverage of anti-retroviral (ARV) medicines among HIV-positive pregnant women in Africa is roughly 80%, which higher than many regions of the world [6], although in high-burden countries, such as Angola, Chad and Nigeria, less than half of pregnant or breastfeeding women living with HIV are receive ARV medicines [5].

Prior to 2012, women received antenatal and intrapartum antiretroviral prophylaxis along with an antiretroviral postpartum “tail” regimen [10]. In 2012, the World Health Organization introduced Options B and B⁺, which entails providing ARV drugs to all HIV-infected pregnant women beginning in the antenatal clinic setting, thereby streamlining clinical contact [10]. The 2016 Ethiopian Demographic and Health Survey (EDHS) shows that 62% of pregnant women in the country had at least one ANC visit [11].

A study in Cameroon showed that 24.3% of women discontinued ARV treatment and another study in Malawi showed that 20% of women were lost to follow-up [12].

Quality of service is essential to improving healthcare in Africa [13] and may influence ARV uptake and consistent use in the context of PMTCT. A study at 60 ANC sites in three African countries showed that the availability of CD4 testing, Pima CD4 machine, air conditioning, and low or high (but not mid-level) patient volume were independent predictors of service quality [14].

Few published studies are available on PMTCT services' provision in Ethiopia and even fewer examine quality of services. Therefore, this study aims to contribute to science by assessing the quality of PMTCT services provision public hospitals of Hadiya Zone, southern Ethiopia.

Methods

The study was an institution-based, cross-sectional study conducted at three public hospitals in Hadiya Zone, approximately 200 kilometers southwest of Ethiopia's capital city, Addis Ababa. The study used both quantitative and qualitative method from March 1 to April 10, 2017.

All public hospitals providing PMTCT services in Hadiya Zone, including Shone, Homecho, and Nigist Elleni Mohammed Memorial Teaching Hospitals, were included in our study. Sample size was determined using single population proportion formula at a 95% confidence level, 80% power of the test and 5% margin of error, where p , the proportion of clients satisfied with PMTCT services, was assumed to be 50%. Considering 10% of non-response rate, the final sample size was 423.

Sample was allocated proportionally to selected hospitals based on average ANC attendance in the three-months preceding the study period. All sampled pregnant women who met inclusion criteria at ANC clinics were interviewed by diploma-level nurses using a structured questionnaire adapted

from UNAIDS and Family Health International (FHI) [15]. The questionnaire was prepared in English, translated to Hadiyisa, and back-translated to English separately by two individuals to ensure consistency. Nurse data collectors were supervised by two BSc supervisors. All data collectors were selected from outside of study area to minimize bias. Incomplete and unclear questionnaires were returned to interviewers to be completed.

To supplement the quantitative study, we conducted in-depth interviews with nine key informants, which were tape-recorded and transcribed on the same day of the interviews. Key informants included health care providers, mother support group and Medical Directors. We also conducted a resource inventory adapted from as well as and direct observation of HIV testing and counseling adherence and support sessions based on a UNAIDS' tool (16). The list of resources was adapted from national PMTCT guideline and assessed the presence health workers, logistics and supplies, waiting area, reporting formats and registers, PMTCT guidelines, and client education materials. Observation sample size was determined based on a UNAIDS' tool and we ultimately conducted 15 observation sessions

Data was entered, cleaned and analyzed using SPSS 20 and was cleaned by running frequencies, cross-tabulation and sorting cases. Bivariate and multivariate logistic regression analyses were used to determine the association of independent variables with the dependent variable. Variables with $p < 0.25$ in bivariate analysis were entered into a multivariate logistic regression model. Odds ratio with 95% confidence were computed to identify the presence and strength of associations, and statistical significance was declared if $p < 0.05$ was found. Final model was checked using the Hosmer–Lemeshow goodness of fit test. Confounders, interaction and multi-collinearity were checked to minimize bias. Qualitative data were analyzed manually using thematic analysis.

Study protocol was approved by the Institutional Research Review Board of Jimma University's, Institute of Health Science and Community Services Ethical Review Committee. Permission was obtained from Hadiya Zone Health Department and participating hospitals. Informed verbal consent was obtained from participants prior to enrollment in the study. Participation in the study was voluntary and participants were informed of the right to withdraw from the study. Data collection was conducted confidentially and data was de-identified, de-linked and stored in a secure location.

Results

A total of 423 women were interviewed, giving a response rate of 100%. Age of respondents ranged from 16 to 43 with a mean age of 27.24 (\pm 5.67) years. Only seventy-nine (18.7%) women were unable to read and write. Three hundred nineteen (75.4%) lived in urban areas and 219 (51.8%) were housewives, followed by government employee 67 (15.8%).

Three-fourths (75.4%) belonged to the Hadiya ethnic group and 413 (97.6%) were married (**Table 1**).

Table 1: Socio-demographic characteristics of respondents, quality of PMTCT services in public hospitals of Hadiya zone, South Ethiopia, 2017.

Variables	Characteristics	Frequency	Percent (%)
Age	15-24	131	31
	25-34	236	55.8
	35-49	56	13.2
Marital status	Currently married	413	97.6
	Not married	10	2.4
Level education	Unable to read and write	79	18.7
	Primary school	190	44.9
	Secondary school and above	154	36.4
Ethnicity	Hadiya	319	75.4
	Gurage	40	9.5
	Wolayita	10	2.4
	Amhara	43	10.2
	Others*	11	2.6
Religion	Protestant	290	68.6
	Orthodox	87	20.6
	Muslim	32	7.6
	Others**	14	3.2
Occupational status	Housewife	219	51.8
	Government Employee	67	15.8
	Student	43	10.2
	Merchant	79	18.7
	Others***	15	3.5
Place of residence	Urban	319	75.4
	Rural	104	24.6

Others*: silte, kembata, others**: catholic, Adventist seventh day, others***: daily labourer, farmers

Most (79.7%) women knew about the availability of PMTCT services before coming to ANC and most (234, 69.4%) derived this information from health workers or health extension workers (65, 19.3%). Three hundred nineteen (75.4%), women waited less than 30 minutes to see a provider. Mean duration of counseling session was 17.37 minutes. The same counselor provided pre- and post-test counseling for 337(79.9%) women. Fifty-one (12.1%) women expressed that a language barrier was present (**Table 2**).

The resource inventory revealed that PMTCT services were provided in integration with other MCH services and that there were separate counseling rooms for ANC/PMTCT at each hospital. Laboratory and Labour and Delivery units were available and functional, including necessary supplies. Running water, electricity, secured pharmaceutical storage and waiting areas were available. ARV drugs were also available.

Table 2: Waiting time, duration, information source and perceived benefit of counseling session; quality of PMTCT services in public hospitals of Hadiya zone south Ethiopia, 2017.

Variables	Characteristics	Frequency	Percent
Awareness about the presence of PMTCT before she came	Yes	337	79.7
	No	86	20.3
Source of information of PMTCT	Health workers	234	69.4
	Mass media	19	5.6
	Friends	5	1.5
	Health extension workers	65	19.3
	Others	14	4.2
Pretest and posttest counseling was given by the same counselor	Yes	338	79.9
	No	85	42.3
There was no language barrier	Yes	372	87.9
	No	51	12.1
The counseling session was beneficial	Yes	413	97.6
	No	10	2.4
	Yes	113	26.7
Sex preference	No	310	73.3
Waiting time to see a service provider	< 30 minutes	319	75.4
	>=30 minutes	104	24.6
Counseling time	< =15 minutes	221	52.2
	>15 minutes	202	47.8
Reason for coming to the ANC center	For antenatal care only	244	57.7
	For antenatal care and to test for HIV	179	42.3
Would recommend the service to others	Yes	397	93.9
	No	26	6.1
Are the opening hours of this clinic convenient for you?	Yes	376	88.9
	No	47	11.1
How long did it take for you to arrive at this clinic	< 30 minutes	264	62.4
	30 min-1 hour	124	29.3
	>1 hour	35	8.3

A member of a mother support group, confirmed that they hospital was well stocked, indicating that:

“...From my experience this hospital is ready to save life of child from HIV because there is no problem of ARV drugs and OI drugs since 2016.”

A female ANC nurse suggested that:

“...If the hospital has test kits and other supplies according to national guideline, the outcome of the service will become very good and contribute to get HIV free generation”.

All recording and reporting formats related to PMTCT services were available in all selected hospitals. However, in Shone Primary Hospital, job aids and, IEC/BCC materials, PMTCT performance standard, and client education materials were not available. No hospital had PMTCT guideline. Although staffing was above required levels, there was a shortage of providers that had been trained specifically on PMTCT (**Table 3**).

Table 3: Total human resources working on PMTCT services and their training status in public hospitals of Hadiya zone, south Ethiopia 2017.

Human resource	Total available			Total trained on the PMTCT service (Plus option B ⁺)		
	SPH	NEMMH	HPH	SPH	NEMMH	HPH
General practitioners	10	54	7	0	1	0
Health officer	8	4	5	1	0	0
Nurses (all types)*	40	163	28	1	4	3
Midwife	14	27	11	1	4	3
Laboratory technologist	3	3	1	0	0	0
Laboratory technician	8	24	5	0	0	0
Pharmacist technician	3	10	1	0	0	0
Pharmacy technologist	9	12	6	0	0	0
PMTCT data clerk	1	2	0	0	0	0
Mother support group	0	4	0	0	0	0
Total	96	303	64	3	8	6

A female midwife from the ANC site of one of the hospital indicated that:

“...There is shortage of trained health care provider in which in case when those health care providers were unavailable, the service will be interrupted.”

The Medical Director from a hospital emphasized that:

“...One of the challenges of the program is shortage of trained health care providers due to staff turnover for different reasons like education.”

Observation of HCT sessions included observation of six providers, four of whom had been trained on both standard and Option B⁺ service provision. In all observation sessions, providers invited clients into the room and offered them a chair to sit and/or greeted clients respectfully. During eight sessions, providers failed to introduce themselves to clients.

Providers discussed the need for and benefits of HIV testing in nine (60%) sessions and ensured understanding of the client by asking pertinent questions in seven (46.7%) sessions. They explained the HIV testing procedure in six (40%) sessions. This is finding is supported with qualitative data.

One key informant assigned to an ANC clinic at one the hospitals said that:

“...Since there is high flow of clients, sometimes we miss pre-test session and we mainly focus on testing procedures and post-test counseling”.

During post-test counseling, providers reinforced prevention messages in 12 (80%) sessions and reminded clients that results do not indicate partner's HIV and the need for retesting in 15n (100%) sessions. No HIV-positive cases were observed (Table 4).

Table 4: Direct observation of HCT sessions in public hospitals of Hadiya zone, south Ethiopia 2017.

Observation items	Yes		No	
	No	%	No	%
Invite client into the room and offer chair to sit	15	100	0	0
Greet patient with respect	15	100	0	0
Introduce self to client	7	46.70	8	53.30
Call client by name	12	80	3	20
Discuss the need and benefits of HIV testing	9	60	6	40
Ensure understanding of the client by asking pertinent questions	7	46.70	8	53.30
Explain the HIV testing procedure	6	40	9	60
Explain the possible HIV test result	8	53.30	7	46.70
Inform the client when the result will be ready and how and where to receive	7	46.70	8	53.30

Complete below for negative test result only				
Test result ready before post-test counseling session begins	15	100	0	0
Close the door or draws the curtains of the room to ensure privacy	9	60	6	40
Invite client into the room	10	66.70	5	33.30
Offers client a seat	11	73.30	4	26.70
Thank the client for waiting	9	60	6	40
inform client that the test result is available	10	66.70	5	33.30
Provide result clearly and simply	9	60	6	40
Review meaning of the result, including window period	15	100	0	0
Reinforce the need to consider the test result in reference to most recent risk exposure	7	46.70	8	53.30
use language that client can understand	15	100	0	0
maintain eye contact	10	66.70	5	33.30
answer client's questions	8	53.30	7	46.70
reinforce prevention messages (A,B,C) so that patient can stay negative	12	80	3	20
remind the client that her result does not indicate partner's HIV status	15	100	0	0

Two providers that were previously trained on standard and Option B⁺ service provision participated in six adherence support session. In all adherence support sessions, providers showed respect for clients and called clients by name.

Providers reviewed possible drug interaction in two (33.3%) sessions. They discussed current health status with clients, including overall health and current problems and the latest CD4 result in 4(66.7%) sessions (**Table 5**).

Table 5: Direct observation result of adherence support session in government hospitals of Hadiya zone, south Ethiopia 2017.

Observations items	Yes		No	
	No	%	No	%
Invite client into the room and offer chair to sit	6	100	0	0.0
Greet client with respect	6	100	0	0
Introduce self to client	4	66.7	2	33.3
Call client by name	6	100	0	0
Discuss current health status with client including overall health and current problems; the latest laboratory result including CD4	4	66.7	2	33.3
Review with client possible barriers to adherence; stigma, living situation	3	50	3	50
Refill the client with standard ART regimen with clear explanation	4	66.7	2	33.3
Review possible drug interaction	2	33.3	4	66.7
Schedule next, discuss what should prompt and earlier visit	6	100	0	0
Review understanding of the client including: asking client to describe her ARV regimen	6	100	0	0

A key informant from the mother support group said that:

"...During adherence support sessions, greeting the client with respect initiates client to correctly adhere to treatment and has positive impact on quality of the services, so respecting the clients is necessary."

A review of one month's worth of PMTCT, ANC and delivery registers revealed that 412 women obtained at least their first

ANC visit at one of the study's hospitals. Three hundred seventy (89.8%) were offered pre-test information and 366 (88.8) obtained an HIV test. All women who were tested were also post-test counseled, regardless of sero-status, and as per the national guideline. Of the 412 women who visited ANC clinics, only 56 (13.6%) had partners who were subsequently tested for HIV as part of PMTCT. All partners tested negative.

A key informant shared the following which was supported by majority of key informants:

“...Partner testing and counseling services are provided intermittently due to unavailability of the test kits and the other reason for low utilization of partner test and counseling service is unwillingness of the partners.”

A key informant assigned to PMTCT service in one of the hospital said:

“...Even though we tried to educate partners about the burden of HIV in different way, still now most of them are unwilling to be tested.”

PMTCT registers revealed that 75 mothers received PMTCT services at the hospitals in the one-month observation period and 74 (98.6%), were currently on HAART. Out of the 74 women on HAART, 68 (91.9%) were on TDF+3TC+EFV (1E) and 6(8.1%) were on AZT+3TC+NVP (1C). Partner status was documented for 60 (90%). Concerning syphilis, only 46 (61%) recorded as non-reactive, but others were not documented. Delivery registers showed a total of 378 mothers received labor and delivery services, including 114 (30.2%) at Shone Primary Hospital, 157 (41.5%) at Nigist Ellen Mohammed Memorial and 107 (28.3%) from Homacho Primary Hospital. Among these women, 366 (96.8%) had unknown HIV status and 12 (3.2%) with known HIV status of HIV/AIDS. Among

mothers who visited the labor and delivery unit with unknown status 351 (92.9%) have received on-coach HTC services, 2 (0.6%) tested positive and 2 (100%) initiated on ARV according to national guideline. Overall, 15 (4%) women had a missed opportunity for HTC services.

A key informant from the mother support group said that:

“...As one of the service given to laboring mothers, all mothers receive HCT services at Labour, given that test kits are available because one of our activities is following HCT services among pregnant women who comes the health institution for delivery.”

Majority (62.2%) of deliveries was spontaneous vaginal deliveries (SVD) and 18.8%, 4.5% and 14.6% were C/S, forceps/ vacuum extraction, and episiotomy, respectively.

The majority of women were satisfied with PMTCT services. Most (82.7%) women were “satisfied” or “very satisfied” with the comfort of the waiting room. Women were similarly satisfied with the counseling room and privacy during counseling, wait time and duration of the counseling session (Table 6). Most women were also satisfied with the counselors themselves, believing them to be respectful, trustworthy, and competent. Three hundred seventy-one (87.7%) women were “satisfied” or “very satisfied” with the service (Table 7).

Table 6: Client satisfaction with the comfort and privacy of counseling room, and adequacy of counseling session; quality of PMTCT services in public hospitals of Hadiya zone, south Ethiopia 2017.

Item: How do you rate your satisfaction with:	Very dissatisfied		Dissatisfied		Neutral		Satisfied		Very satisfied	
	No	%	No	%	No	%	No	%	No	%
Provider's greeting was good and friendly?	1	0.2	55	13	24	5.7	243	57.4	100	23.6
Comfort of the waiting room	2	0.5	39	9.2	32	7.6	259	61.2	91	21.5
Waiting time	5	1.2	52	12.3	26	6.1	265	62.6	76	18
Comfort of the counseling room	4	0.9	44	10.4	28	6.6	258	61	84	19.9
Adequacy of duration of the counseling session	4	0.9	44	10.4	30	7.1	254	60	91	21.5
Privacy of the counseling room	4	0.9	44	10.4	28	6.6	255	60.3	92	21.7
The cleanliness and sanitation of procedure	7	1.7	53	12.5	27	6.4	251	59.3	85	20.1

Table 7: Client satisfaction by counselor’s characteristics and availability of services, quality of PMTCT services in public hospitals of Hadiya zone south Ethiopia, 2017.

Item: How do you rate your satisfaction with:	Very dissatisfied		Dissatisfied		Neutral		Satisfied		Very satisfied	
	No	%	No	%	No	%	No	%	No	%
Respectfulness of the counselor	2	0.5	55	13	30	7.1	237	56	99	23.4
Trustworthiness of the counselor	5	1.2	57	13.5	24	5.7	237	56	100	23.6
Clarity of the counselor's explanation	3	0.7	45	10.6	33	7.8	246	57	101	23.9
The counselor's competency	4	0.9	55	13	21	5	239	56.5	104	24.6

laboratory service available when always needed	5	1.2	56	13.2	22	5.2	245	57.9	95	22.5
availability of information to MTCT and PMTCT	5	1.2	52	12.3	16	3.8	249	58.9	101	23.9
Clear explanation about Appointment date	3	0.7	51	12.1	21	5	245	57.9	95	22.5
The overall services	5	1.2	37	8.7	10	2.4	271	64.1	100	23.6

Women who waited less than 30 minutes to see a provider had odds 4.6 times higher [AOR=4.65,95% CI=(2.18,9.89) of being satisfied as compared to those that waited \geq 30 minutes [AOR=4.65,95% CI=(2.18,9.89), p-value=0.00]. Women counseled for more than 15 minutes had odds 3.7 times more likely to be satisfied than women counseled for <15 minutes

(AOR=3.7, 95% CI; 1.65, 8.54). Women who were not counseled by the same ANC counselor before and after HIV test were considerably less likely to be satisfied as compared to women whose counseling given by same counselor (AOR=0.19, 95% CI; 0.09, 0.41) (Tables 8 and 9).

Table 8: Bivariate analysis of variables with overall satisfaction of pregnant women in public hospitals of Hadiya zone south Ethiopia 2017.

Variable		Satisfied	Dissatisfied	p-value	COR	95% C.I for COR
Name	Category	No (%)	No (%)			
Age	15-24	120 (91.6)	11 (8.4)	0.126 [†]	2.09	(0.81,5.36)
	25-34	213 (90.3)	23 (8.7)	0.178	1.77	(0.77,4.078)
	35-45	47 (83.9)	9 (16.1)	1		
Marital status	Married	371 (89.8)	42 (10.2)	0.986	0.98	(0.12,7.94)
	Not married	9 (90)	1 (10)	1		
Level of education	Unable to read and write	70 (88.6)	9 (11.4)	1	0.85	(0.38,1.91)
	Primary school	165 (86.8)	25 (13.2)	0.692	2.07	(0.79,5.45)
	Secondary school	145 (94.2)	9 (5.8)	0.140 [†]		
Religion	Protestant	266 (93)	20 (7)	0.004 [†]	3.33	(1.45,7.62)
	Orthodox	74 (85.1)	13 (14.9)	0.447	1.42	(0.57,3.53)
	Others	40 (80)	10 (20)	1		
Occupational status	Housewife	204 (93.2)	15 (6.8)	0.644	1.28	(0.45,3.69)
	Gov. employee	64 (95.5)	3 (4.5)	0.353	2.01	(0.46,8.8)
	Merchant	59 (74.7)	20 (25.3)	0.017 [†]	0.29	(0.09,0.8)
	Others	53 (92.4)	5 (8.6)	1		
Place of residence	Urban	283 (88.7)	36 (11.3)	0.187 [†]	0.58	(0.24,1.32)
	Rural	97 (93.3)	7 (6.7)	1		
Time of arrival	<30 minutes	247 (93.6)	17 (6.4)	0.002 [†]	4.31	(1.69,10.91)
	30 minutes to 1 hour	106 (85.5)	18 (14.5)	0.243	1.75	(0.69,4.44)
	>1 hour	27 (77.1)	8 (22.9)	1		
Waiting time	<30 minutes	299 (93.7)	20 (6.3)	0.00 [†]	4.25	(2.22,8.11)
	\geq 30 minutes	81 (77.9)	23 (22.1)	1		
Counseling time	\leq 15 minutes	188 (85.1)	33 (14.9)	1	3.37	(1.62,7.03)
	>15 minutes	192 (95)	10 (5)	0.001 [†]		
Sex preference	Yes	103 (91.2)	10 (8.8)	0.589	1.23	(0.58,2.58)
	No	277 (89.4)	33 (10.6)	1		
counselor speak the same language as you	Yes	337 (90.6)	35 (9.4)	0.169 [†]	0.56	(0.24,1.28)
	No	43 (84.3)	1 (5.7)	1		

counseling given by the same counselor before and after test	Yes	317 (93.8)	21 (6.2)	1	0.19	(0.09,0.37)
	No	63 (71.4)	22 (28.6)	0.00*		
Reason for coming to the ANC center	For antenatal care only	214 (87.7)	30 (12.3)	0.094*	0.56	(0.28,1.11)
	For antenatal care and HIV test	166 (92.7)	13 (7.3)	1		
the counseling and testing service is beneficial	Yes	371 (89.8)	42 (10.2)	0.986	0.98	(0.12,7.94)
	No	9 (90)	1 (10)	1		
opening hours of this clinic convenient	Yes	338 (89.9)	38 (10.1)	0.909	1.06	(0.39,2.84)
	No	42 (89.4)	5 (10.6)	1		

N.B: *where variables with P-value less than 0.25 were candidate for multivariable logistic regression analysis.

Table 9: Multivariable logistic regression analysis of variables predicting satisfaction of PMTCT clients in public hospitals of Hadiya zone, south Ethiopia 2017.

Variable		Satisfied	Dissatisfied	p-value	AOR	95% CI of AOR
Name	Category	No (%)	No (%)			
counseling given by the same counselor in pretest information and posttest counseling	Yes	317 (93.8)	21 (6.2)	1	0.19	(0.09,0.41)
	No	63 (71.4)	22 (28.6)	0.000		
Waiting time	<30 minutes	299 (93.7)	20 (6.3)	0.000	4.65	(2.18,9.89)
	>=30 minutes	81 (77.9)	23 (22.1)	1		
Counseling time(pre and posttest)	<= 15 minutes	188 (85.1)	33 (14.9)	1	3.75	(1.65,8.54)
	< 15 minutes	192 (95)	10 (5)	0.002		

Note: Hosmer and Lemeshow Test=0.885 therefore the model adequately fits the data.

Discussion

Our study revealed that most of the minimum required resources like infrastructure, test kits, ARV drugs, OI drugs, and HMIS job aids were available at our three study hospitals in Hadiya Zone, southern Ethiopia. Shone Primary Hospital had only three trained providers, which is less than recommended by the national guideline (17). Turnover was the main reason for this insufficient staffing, according to the hospital's Medical Director. All recording and reporting formats related to PMTCT Option B+ services were available in the hospital. One hospital lacked PMTCT performance standard, cue card, and client education materials and none of the three hospitals had PMTCT guideline as opposed to the recommendation of the national guideline, which is contrary to the national guideline, but consistent with a study in Kafa Zone (18).

Roughly 90% of ANC attendees were offered and accepted HIV tests, which is considerably higher than the 38.5% of women that were offered and HIV test in the study in Kafa Zone (18). As in Kafa, all were post-test counseled, regardless of their sero-status.

In our study, the majority of partners didn't obtain HCT and remained with unknown status. Our qualitative findings suggest that partners are unwilling to obtain HCT. Program resources were the base for the process of care. In case when required program resources are not in place, there is the

possibility of missing opportunity by clients and deterioration of quality of offered services, which is consistent with the study conducted in South Africa [10]. Program resources like HIV test kits, guidelines and PMTCT performance standard, client education materials like brochures and leaflets and PMTCT cue card should be consistently supplied to the public hospitals of Hadiya Zone.

In observation session of HTC, providers received women in a welcoming manner and offered a chair to sit/exchanged respectful greetings, which is consistent with the study in Kafa Zone (18). Over 80% of women were satisfied with the privacy of counseling rooms, which is similar to a study in Addis Ababa (19) and slightly higher than a study in Tanzania (20) [12]. Overall satisfaction with PMTCT service was 89.8%, which is similar to Kafa Zone (18) and Dessie City Administration (21) and higher than studies in Nigeria, Adama [Ethiopia] and Tanzania (range 40%-75%)(20,22,23).

Not being counseled by the same ANC counselor pre- and post-test was a significant predictor of patient satisfaction, which is consistent with the study in Adama (22). It is recommended that the same person offer pre- and post-test counseling (24). These findings might be related to clients' concerns regarding issues of confidentiality. [Extended counseling sessions were also tied to patient satisfaction in our study. The odds of a woman being satisfied were 3.7 times higher among women whose counseling sessions lasted more

than 15 minutes, a finding supported by the study in Addis Ababa (19) [12]. Discussing for extended periods may decrease women's fears about a positive test result. Lastly, women who waited less than 30 minutes to see counselor had higher odds of being to be satisfied, which is consistent with a study in Zimbabwe (25). Decreasing wait time might encourage service utilization.

Our study has several strengths, including employing a validated and standardized questionnaire that was tested and revised. Our study also used newly implemented Federal Ministry of Health (FMOH) guidelines on PMTCT to avoid measurement bias. Since respondents were interviewed in the hospital setting, they may have given responses biased in favor of the providers/healthcare facility; however, interviews were conducted in a separate room by non-staff members to minimize bias.

We also are aware that observing providers' communication, testing and counseling services may have biased providers to modify or improve aspects of their behavior in response to being observed.

In general, all public hospitals of Hadiya Zone should design appropriate quality improvement interventions to ensure that both the facility and the providers optimally adhered to the national PMTCT implementation guideline.

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Authors' Contributions

Behailu Balcha: Had made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data, and Fikru Tafese, Feyera Gebissa and Dejene Ermias had revised the paper critically for important intellectual content starting from proposal development to manuscript preparation. All authors read and approved the final manuscript.

Competing Interests

The authors declare that they have no competing interests.

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