

**BJMHR**

British Journal of Medical and Health Research

Journal home page: www.bjmhr.com

Scaling up Prevention of Mother-to-Child Transmission of HIV (PMTCT) service delivery in Nigeria: how can traditional birth attendants be engaged

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ABSTRACT

Prevention of Mother-to-Child Transmission of HIV (PMTCT) is a critical component of HIV control and if well implemented drastically reduces transmission to a child. However, Mother-to-Child Transmission of HIV (MTCT) remains a huge burden. Health facility-based antenatal care is still the main vehicle used for PMTCT services in Nigeria, when less than 40% patronize them. In view of shortages of qualified health personnel globally, engaging TBAs will improve the coverage of PMTCT services as it has the potential of bridging the gap. The aim of this study is to provide evidence to inform engagement of TBAs for PMTCT service delivery scale-up in Nigeria. A cross-sectional survey was conducted among TBAs using questionnaires. Total study was done involving 409 TBAs. Data collected was analyzed using IBM SPSS version 25. Chi-square test was used for association of characteristics of TBAs with knowledge and practice on HIV as well as factors influencing willingness to collaborate in the PMTCT programme at < 0.05 . Predictors were ascertained using Binary Logistic regression. Ethical Consideration were duly observed. In all, 241(58.9%) had overall good knowledge on HIV. The main source of knowledge was Healthcare workers 336 (82.2%). Majority correctly identified ways of HIV transmission and how transmission from infected mother to child can be prevented ($>75\%$). The overall practice on HIV was poor 264 (64.5%) even though the majority 341 (83.4%) refer their HIV clients to health facility. Practices on personal protection was good ($>70\%$). About 378 (92.4%) agree that they have a role in PMTCT for their clients and babies, however only 99 (24.2%) were willing to collaborate in the PMTCT programme. Identified predictors for good practice were; aged ≤ 45 years (AOR 2.66; 95% CI 1.08– 18.46), had primary education and below (AOR 0.68; 95% CI 0.05 – 0.75) and good knowledge (AOR 12.62; 95% CI 8.33 – 44.17). Identified predictors for agreeing to collaborate in the PMTCT programme were good knowledge (AOR 6.34; 95% CI 3.55 – 41.27) and good practice (AOR 3.15; 95% CI 1.74 – 13.35). The attainment of PMTCT treatment targets for Nigeria is crucial to that of the world. TBAs are an important but currently underused resource for PMTCT scale-up. There is need to involve TBAs in PMTCT service delivery in Nigeria as if effectively engaged could bridge the gap in HIV control in Nigeria.

Keywords: Prevention of Mother-to-Child Transmission of HIV services, Traditional Birth Attendants, Engaged, Nigeria

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Received 02 March 2025, Accepted 19 April 2025

Please cite this article as: Aniwada EC *et al.*, Scaling up Prevention of Mother-to-Child Transmission of HIV (PMTCT) service delivery in Nigeria: how can traditional birth attendants be engaged? . British Journal of Medical and Health Research 2025.

INTRODUCTION

Human Immunodeficiency Virus or Acquired Immunodeficiency syndrome [HIV/AIDS] is a major killer of under five children, especially in low income countries ¹. About 25 to 30% of children born to infected mothers without intervention become infected with HIV and almost all of them die before five years of age ^{1,2}. Mother-to-child transmission (MTCT) may occur during pregnancy, labour, and after childbirth, with 10–15% of the highest risks during breastfeeding ³. It is responsible for 90% of all new paediatric human immunodeficiency virus (HIV) infections in Nigeria ². Nigeria accounted for 37,000 of the world's 160,000 new cases of babies born with HIV ⁴. The country accounts for 30% of the world's gap in attaining the world-wide target of eradicating MTCT of HIV ⁵.

Prevention of Mother-to-Child Transmission of HIV (PMTCT) is a critical component of the national HIV response in Nigeria. If well implemented, it reduces transmission of HIV from mother to child during pregnancy, labor, delivery, or breastfeeding from 45 to 2% ⁶. It commenced in 2002, in only 6 pilot tertiary institutions, reaching less than 1% of women in need of PMTCT ⁷. In 2014, PMTCT sites increased to 6,546 with services decentralized to secondary, primary as well as private health facilities. Also the number of HIV positive pregnant women who received Antiretroviral therapy (ARV) to reduce the risk of MTCT of HIV increased from 13,000 to 63,350 ⁷. Health care workers were equally trained on PMTCT services to ensure proper implementation in routine care.

Despite these achievements Mother-to-Child Transmission of HIV (MTCT) remains a huge burden in Nigeria.⁸ For example, in 2017: merely 35% of pregnant women who attended Ante Natal Care (ANC) were tested for HIV, about 30% of HIV-infected pregnant women received ARV therapy, and 36,000 children were HIV infected ⁹. The same year, Nigeria had an MTCT rate of 26.9% and the slowest decline in MTCT rate in sub-Saharan Africa. ⁹. This implies that Nigeria is not on course to eliminate new HIV infections among children.

Health facility-based antenatal care is still the main vehicle used for PMTCT services in Nigeria ⁷. Unfortunately, less than 40% of Nigerian women give birth under supervision of skilled attendant. This implies that over 60% of Nigerian women are at excess risk of maternal and child death, as they do not have access to or utilize available lifesaving services including PMTCT¹⁰. Therefore, it is essential to create interventions to improve non-facility PMTCT of HIV ^{7,11}. Engaging TBAs will improve the coverage of PMTCT services in Nigeria. ¹² as it has the potential of bridging the gap between formal PMTCT delivery points and the cultural communities where majority of the targeted pregnant women live. Previous studies reported that the involvement of TBAs in PMTCT programs can reduce

paediatric HIV infections since the majority of such infections in our environment are due to vertical transmission^{13, 14}.

Throughout history, TBAs have been the main human resource for women during pregnancy as they attend to the majority of pregnant women in the rural areas of low income countries¹⁵. Studies in Africa, including Nigeria reported that 40 - 60% home deliveries are conducted by TBAs^{16, 17}. However, the majority of TBAs in Nigeria lack competence and skills in recognizing and dealing with Emergency Obstetric Care (EMOC) and they do not adequately nor timely link clients with the formal health system¹⁸. They equally have no or poor knowledge of PMTCT¹⁹.

Consequently, TBAs undergo some forms of rejection from qualified health personnel. Nonetheless, in view of the varying degrees of shortages of qualified health personnel globally, estimated to be up to 4.2 million by WHO and worse in low income countries like Nigeria, the need for engaging TBAs in providing maternity care based on the local conditions is very crucial^{13,18}. While the need to strengthen the health system to ensure skilled birth attendance at all deliveries is imperative in the long term, the present reality in Nigeria requires an urgent action. Researchers documented that TBAs who were trained on HIV Counselling and Testing (HCT) significantly increased their knowledge and skills¹⁹. These TBAs if effectively engaged could bridge the gap between the communities and the formal health sector, improving the uptake and coverage of PMTCT services.

In Cameroon, trained TBAs were used to provide pre- and post-test counselling, oral rapid HIV tests and administer single-dose Nevirapine during labour to pregnant women and newborns in rural villages²⁰. With this, prophylaxis coverage rates of more than 85% were attained for mothers living with HIV and their babies. Similarly, a TBA PMTCT pilot program in rural Zambia showed that in-home silver-based oral HIV testing and Nevirapine dosing by TBAs was feasible and acceptable²¹. In Tanzania and Malawi, it has been demonstrated that trained TBAs could be used effectively in PMTCT program implementation (counseling, mobilization of women for HCT)^{22, 23}.

Although the need to engage TBAs for PMTCT scale-up in Nigeria has been acknowledged, there is little evidence to inform effective engagement. While a few studies have assessed the knowledge, attitude and practice on HIV among TBAs^{24, 25}, there is a gap in literature on how TBAs can and are willing to participate in the PMTCT programme. The HIV prevalence in Abia state showed an downward trend from surveillance reports from 7.3% in 2015 to 5.1% in 2018 according to Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS). This is still higher than the regional and national average. It is one of the “12 + 1” states accounting for 70% of the national burden of mother to child transmission of HIV (MTCT) ranking the

8th in the country and 2nd in the South-East zone. It is therefore an important state to target for eliminating mother-to-child transmission of HIV in Nigeria. The attainment of PMTCT treatment targets for Nigeria is crucial to that of the world.

The aim of this study is to provide evidence to inform engagement of TBAs for PMTCT scale-up in Nigeria. The ultimate goal is to generate evidence that will inform the decision making process in designing policy to incorporate TBAs into PMTCT scale-up programme in Nigeria.

MATERIALS AND METHOD

Study Location

The study was conducted across seventeen (17) local government areas in Abia state, South-East Nigeria. It is located between longitudes $7^{\circ} 10'$ and 8° East of the Greenwich meridian and latitudes $4^{\circ} 40'$ and $6^{\circ} 14'$ north of the Equator. They are of the Igbo tribe. The state is largely agrarian with some manufacturing, crude oil and gas production activities. The major commercial city is Aba. The state has a total population of about 2,845,380 (2006 census figures) and HIV sero-prevalence rate of 5.1 %⁷ while the national HIV sero-prevalence level is 4.1%.⁷ It is one of the 12⁺¹ priority states for saturation of PMTCT intervention in order to reduce and possibly eliminate MTCT of HIV. It has many TBAs as most women deliver at home by TBAs even after registering and attending ANC in health facilities.

Study design

It was a cross-sectional survey among TBAs in Abia State using qualitative data collection method.

Sample size and population

A total study was done involving all TBAs identified by Officers in Charge (OIC) in the various LGAs making up Abia state who gave consent.

Data Collection Tool and procedure

Data was collected using self-designed, pre-tested, interviewer administered semi-structured questionnaire. Information was collected on the socio-demographic characteristics of respondents, HIV/PMTCT knowledge and practice, and willingness to participate to collaborate with formal providers. Researchers and five trained research assistants collected the data by visiting the TBAs in their respective communities or site of practice for questionnaires.

Data analysis

Data collected was analyzed using IBM statistical package for social science (SPSS) version 25. It was summarized using proportions and percentages for categorical variables while

mean and standard deviation (normally distributed data) or median and interquartile range (skewed data) used for quantitative variables. Chi-square test was used for association of characteristics of TBAs with knowledge and practice on HIV as well as factors influencing willingness to collaborate in the PMTCT programme. The level of significance will be at < 0.05. Predictors were ascertained using Binary Logistic regression.

Ethical Consideration

Ethical approval was obtained from University of Nigeria Teaching Hospital Health Research and Ethics Committee. Permission was sought from Local Government authorities and community leaders. Written informed consent was obtained from all study participants by appending their signature/thumb printing on the consent form prepared for this study. This was done after the study design and protocol has been described to potential participants. Voluntary participation was observed. Participants were assured of the confidentiality of their responses and this maintained throughout the study. Also data collection tools do not have any client information as study codes were assigned and data safety ensured.

RESULTS AND DISCUSSION

Table 1 shows that majority of TBAs were aged ≤ 45 years 234 (57.2%), had secondary education and above 282 (68.9%), married 300 (73.3%), practiced for ≤ 10 years 177 (43.3%), trained through apprenticeship under another TBA 156 (38.1%) and conduct < 10 deliveries per month 301 (73.6%). Most of them engage in other works in addition to TBA activities 214 (52.3%). Key activities carried out as TBA were; assisting in deliveries 379 (92.7%), circumcision 213 (52.1%), infertility 81 (19.8%), family planning 63 (15.4%) and scarifications 17 (4.2%). Perceived reasons for patronage by these pregnant women were; trust 290 (70.9%), financial difficulties 156 (38.1%), attitude of health workers 72 (17.6%), local tradition 49 (12.0%) and no nearby health facility 37 (9.0%).

Table 1: Characteristics of TBAs

Variables	Frequency	Percent (%)
Age categories (Years)		
≤ 45	234	57.2
>45	175	42.8
Education		
Primary and below	127	31.1
Secondary and above	282	68.9
Marital status		
Married	300	73.3
Others	109	26.7
Duration of practice		
10 and below	177	43.3
11-20	119	29.1
>20	113	27.6
Trainer in the job		

Trained by parent	148	36.2
Apprenticeship under another TBA	156	38.1
Others	105	25.7
Number of deliveries (month)		
<10	301	73.6
10 and above	108	26.4
Job specification		
TBA alone	195(47.7)	214(52.3)
Duties carried out as TBA		
Assisting deliveries	379(92.7)	30(7.3)
Family planning	63(15.4)	346(84.6)
Scarifications	17(4.2)	392(95.8)
Circumcisions	213(52.1)	196(47.9)
Infertility	81(19.8)	328(80.2)
Perceived reasons for patronage by these pregnant women		
Financial difficulties	156(38.1)	253(61.9)
Local tradition	49(12.0)	360(88.0)
Trust	290(70.9)	119(29.1)
No nearby health facilities	37(9.0)	372(91.0)
Attitude of healthcare worker	72(17.6)	337(82.4)

Table 2 shows that 241(58.9%) had overall good knowledge on HIV. In all, 403 (98.5%) have heard of HIV/AIDS. The main sources of knowledge were Healthcare workers 336 (82.2%), radio 177 (43.3%), Television 140 (34.2%) and fellow TBA 49 (12.0%). Their identified ways of HIV transmission include; sexual intercourse with infected persons 372 (91.0%), transfusion of infected blood 350 (85.6%) and use of infected contaminated sharps 318 (77.8%). The TBAs stated that: HIV can be; cured 319 (78.0%), transmitted from an infected mother to her child 343 (83.9%) and transmission from infected mother to child can be prevented 376 (91.9%). Ways of transmission from infected mother to her child include; during pregnancy 288 (70.4%), at labour/delivery 339 (82.9%) and through breastfeeding 304 (74.3%). Key ways of preventing transmission from infected mother to her child include; use of drugs for HIV in pregnancy and during breastfeeding 376 (91.9%), Condom use 169 (41.3%) and abstaining from sex 105 (25.7%). Also, 379 (92.7%) said that HIV exposed infant requires drugs after delivery, 378 (92.4%) that infant requires a test to determine his/her status and 302 (79.9%) indicated that best time to get the HIV exposed infant tested is <3 years.

Table 2: Knowledge on HIV by TBAs

	Yes Freq(%)	No Freq(%)
Ever heard of HIV/AIDS	403(98.5)	6(1.5)
Source/s of Knowledge		

Radio	177(43.3)	232(56.7)
Television	140(34.2)	269(65.8)
Healthcare worker	336(82.2)	73(17.8)
Fellow TBA	49(12.0)	360(88.0)
Ways of Transmission of HIV (general)		
Sexual intercourse with infected persons	372(91.0)	37(9.0)
Use of infected contaminated sharps	318(77.8)	91(22.2)
Sharing of clothes	13(3.2)	396(96.8)
Blood transfusion with infected blood	350(85.6)	59(14.4)
Mosquito bite	18(4.4)	391(95.6)
HIV can be cured	319(78.0)	90(22.0)
HIV can be transmitted from an infected mother to her child	343(83.9)	66(16.1)
HIV transmission from infected mother to child can be prevented	376(91.9)	33(8.1)
Ways HIV can be transmitted from infected mother to child		
During pregnancy	288(70.4)	121(29.6)
At labour/delivery	339(82.9)	70(17.1)
Through breastfeeding	304(74.3)	105(25.7)
Ways of preventing transmission from infected mother to child		
Use of drugs for HIV in pregnancy and during breastfeeding	376(91.9)	33(8.1)
Condom use	169(41.3)	240(58.7)
Abstaining from sex	105(25.7)	304(74.3)
Eating better	76(18.6)	333(81.4)
Through traditional/local herbs	10(2.4)	399(97.6)
HIV exposed infant requires drugs after delivery	379(92.7)	30(7.3)
HIV exposed infant requires a test to determine its own status	378(92.4)	31(7.6)
If Yes, best time to get the HIV exposed infant tested		
<3	302	79.9
3 -17	53	14.0
18 and above	23	6.1
	Good	Poor
Overall correct knowledge on HIV	241(58.9)	168(41.1)

Table 3 shows that overall practice on HIV was poor 264 (64.5%). In all, 244 (59.7%) inform or counsel clients about HIV, 236 (57.7%) refer clients for HIV counseling and testing, 197 (48.2%) refer infants born to hospital after delivery of HIV+ women and 145 (35.5%) conduct HIV test on their clients. Majority, 341 (83.4%) refer their HIV clients to health facility. In all, 132 (32.3%) had patients who tested positive for HIV. Things done for HIV positive patients include; take extra precautions while managing them 351 (85.8%), refer them to the hospital 152 (37.2%), inform and counsel them about their status 126 (30.8%) and take the delivery as normal 41 (10.0%). Practices to protect themselves and clients from HIV were; use of gloves 308 (75.3%), use of new blade for each patient 300 (73.3%), soaking equipment in bleach 292 (71.4%), sterilization of equipment 283 (69.2%) and wearing of protective clothing 265 (64.8%).

Table 3: Practice on HIV by TBAs

Variables	Correct	Incorrect
Activities to curb HIV spread	Freq(%)	Freq(%)

Inform or counsel your clients about HIV	244(59.7)	165(40.3)
Refer your clients for HIV counseling and testing	236(57.7)	173(42.3)
Conduct HIV test on you clients	145(35.5)	264(64.5)
Refer the infants born to them to hospital after delivery of HIV+ women	197(48.2)	212(51.8)
Place referred to	Yes	No
Health facility	341(83.4)	68(16.6)
Church/religious home	3(0.7)	406(99.3)
Another TBA	6(1.5)	403(98.5)
Those whose patients have tested positive for HIV	132(32.3)	277(67.7)
Things done for HIV positive patients		
Inform and counsel them about their status	126(30.8)	283(69.2)
Take the delivery as normal	41(10.0)	368(90.0)
Refer them to the hospital	152(37.2)	257(62.8)
Take extra precautions while managing them	351(85.8)	58(14.2)
Practices to protect yourself and your patients from HIV		
Use of gloves	308(75.3)	101(24.7)
Sterilization of equipment	283(69.2)	126(30.8)
Use of new blade for each patient	300(73.3)	109(26.7)
Soaking equipment in bleach	292(71.4)	117(28.6)
Wearing of protective clothing	265(64.8)	144(35.2)
	Good	Poor
Overall practice on HIV	145(35.5)	264(64.5)

Table 4 shows that 378 (92.4%) agree that they have a role in PMTCT for their clients and babies, however only 99 (24.2%) were willing to collaborate in the PMTCT programme. Main roles they are willing to play include; HIV counseling 336 (82.2%), refer their clients for HIV test 294 (71.9%), mobilize clients for HIV test during outreach 247 (60.4%) and conduct HIV test if trained 216 (52.8%). Reasons for the objection to collaborate were; fears for loss of patients 278 (89.5%) and money 295 (95.1%), claim that they can manage it themselves 293 (94.4%), clients will not like to go to hospital 287 (92.4%) and do not know where to refer them 301 (96.8%). For those willing to collaborate, 90 (90.2%) will allow their patient's care be taken over in the hospital if need be. Main support they need from government were supervision 263 (64.3%) and regular feedback 253 (61.9%).

Table 4: Knowledge and practice on PMTCT by TBAs

	Yes Freq(%)	No Freq(%)
Agree that you have a role in PMTCT for your clients and their babies	378(92.4)	31(7.6)
Roles you are willing to play		
Give HIV counseling	336(82.2)	73(17.8)

Mobilize clients for HIV test during outreach	247(60.4)	162(39.6)
Refer all my clients for HIV test	294(71.9)	115(28.1)
Conduct HIV test if trained	216(52.8)	193(47.1)
Take deliveries and administer drugs	140(34.2)	269(65.7)

Willingness to collaborate in the PMTCT programme like referring your clients to the hospital for HIV test and returning back to you after the test 99(24.2) 310(75.8)

Reasons for the objection**n = 310**

I would lose my patients	278(89.5)	32(10.5)
I would lose money	295(95.1)	15(4.9)
I can treat them by myself	293(94.4)	17(5.6)
My clients would not like to go to the hospital	287(92.4)	23(7.6)
I don't know where to refer them	301(96.8)	9(3.2)

Willing to collaborate, will you allow you patient's care be taken over in the hospital if need be 90(90.2) 9(9.7)
n = 99

Support you will like from the health care providers

Capacity building	194(47.4)	215(52.6)
Regular feedback	253(61.9)	156(38.1)
Provision of consumables for universal precautions	192(46.9)	217(53.1)
Supervision	263(64.3)	146(35.7)
Provision of HIV/ AIDS medication	184(45.0)	225(55.0)

Table 5 shows that there were no statistically significant associations of clients' characteristics with overall knowledge on HIV (all $p > 0.05$)

Table 5: Associations of Characteristics with overall knowledge on HIV

Variables	Good n(%)	Poor n(%)	χ^2 test	p value
Age categories (Years)				
≤ 45	140(59.8)	94(40.2)	0.185	0.667
>45	101(57.7)	74(42.3)		
Education				
Primary and below	68(53.5)	59(46.5)	2.203	0.138
Secondary and above	173(61.3)	109(38.7)		
Marital status				
Married	178(59.3)	122(40.7)	0.078	0.780
Others	63(57.8)	46(42.2)		
Duration of practice				
10 and below	104(58.8)	73(41.2)	0.995	0.608
11-20	74(62.2)	45(37.8)		
>20	63(55.8)	50(44.2)		
Trainer in the job				
Trained by parent	83(56.1)	65(43.9)	1.207	0.547
Apprenticeship under another TBA	97(62.2)	59(37.8)		

Others	61(58.1)	44(41.9)		
Number of deliveries per month				
<10	173(57.5)	128(42.5)	0.989	0.320
10 and above	68(63.0)	40(37.0)		

Table 6 shows that there were statistically significant associations of age ($p = 0.005$), education ($p = 0.006$), duration of practice ($p = 0.015$) and knowledge ($p < 0.001$) with overall practice on HIV. Those aged ≤ 45 years were about 3 times (AOR 2.66; 95% CI 1.08–18.46) more likely to have overall good practice than those aged >45 years. Those that had primary education and below were about 0.7 times (AOR 0.68; 95% CI 0.05 – 0.75) likely to have overall good practice than those that had secondary education and above. Those that had good knowledge were about 13 times (AOR 12.62; 95% CI 8.33 – 44.17) more likely to have overall good practice than those with poor knowledge on HIV.

Table 6: Factors influencing overall practice on HIV

Variables	Good n(%)	Poor n(%)	Bivariate χ^2 (p value)	Multivariate AOR((5% CI)
Age categories (Years)				
≤ 45	138(59.0)	97(41.0)	8.017(0.005)	2.66(1.08-18.46)
>45	78(44.8)	96(55.2)		1
Education				
Primary and below	54(42.9)	72(57.1)	7.441(0.006)	0.68(0.05-0.75)
Secondary and above	162(57.4)	120(42.6)		1
Marital status				
Married	164(54.7)	137(45.3)	1.354(0.245)	NA
Others	52(48.1)	56(51.9)		
Duration of practice				
10 and below	105(59.3)	73(40.7)	8.343(0.015)	3,11(0.58-14.44)
11-20	64(53.8)	55(46.2)		2.16(0.35-6.83)
>20	47(42.0)	65(58.0)		1
Trainer in the job				
Trained by parent	81(54.7)	68(45.3)	0.446(0.800)	NA
Apprenticeship under another TBA	82(52.9)	73(47.1)		
Others	53(50.5)	52(49.5)		
Number of deliveries per month				
<10	158(52.7)	143(47.3)	0.034(0.853)	NA
10 and above	58(53.7)	50(46.3)		
Knowledge				
Good	149(62.1)	92(37.9)	19.554(<0.001)	12.62(8.33-44.17)

Poor

67(39.9)

101(60.1)

1

Table 7 shows that there were statistically significant associations of knowledge ($p = 0.006$) and practice ($p = 0.029$) with willingness to collaborate in the PMTCT programme. Those that had good knowledge were about 6 times (AOR 6.34; 95% CI 3.55 – 41.27) more likely to agree to collaborate in the PMTCT programme than those with poor knowledge on HIV. Those that had good practice were about 3 times (AOR 3.15; 95% CI 1.74 – 13.35) more likely to agree to collaborate in the PMTCT programme than those with poor practice on HIV.

Table 7: Factors influencing willingness to collaborate in the PMTCT programme

Variables	Good n(%)	Poor n(%)	Bivariate χ^2 (p value)	Multivariate AOR((5% CI)
Age categories (Years)				
≤ 45	57(24.4)	177(75.6)	0.007(0.933)	NA
>45	42(24.0)	133(76.0)		
Education				
Primary and below	31(24.4)	96(75.6)	0.004(0.948)	NA
Secondary and above	68(24.1)	214(75.9)		
Marital status				
Married	78(26.0)	222(74.0)	1.976(0.160)	2.19(0.97-9.30)
Others	21(19.3)	88(80.7)		
Duration of practice				
10 and below	42(23.7)	135(76.3)	0.757(0.685)	NA
11-20	32(26.9)	87(73.1)		
>20	25(22.1)	88(77.9)		
Trainer in the job				
Trained by parent	43(29.1)	105(70.9)	3.160(0.206)	NA
Apprenticeship under another TBA	32(20.5)	124(79.5)		
Others	24(22.9)	81(77.1)		
Number of deliveries per month				
<10	76(25.2)	225(74.8)	0.677(0.411)	NA
10 and above	23(21.3)	85(78.7)		
Knowledge				
Good	70(29.1)	171(70.9)	7.474(0.006)	6.34(3.55-41.27)
Poor	29(17.3)	139(82.7)		
Practice				
Good	66(28.2)	168(71.8)	4.757(0.029)	3.15(1.74-13.35)
Poor	33(18.9)	142(81.1)		

DISCUSSION

Findings show that TBAs had overall good knowledge on HIV including ways of transmission and prevention with Healthcare workers as main source of knowledge. However overall practice was poor on prevention of MTCT even when majority take preventive measures to ensure that they do not get infected with HIV like wearing Personal Protective Equipment (PPE) and sterilizing their equipment. Previous studies have divergent findings on this. In Lagos, Nigeria, most of the TBAs did not have adequate knowledge and practice on HIV as well as PMTCT demonstrating the need for periodic PMTCT training for TBAs ²⁶. In Taraba State TBAs observed safety precautions as over three-quarters of the participants always used surgical gloves, and a new blade for cutting the umbilical cord. This corroborates with reports from previous studies in other states and countries ^{24,27}. In contrast, another study identified that notable deficiencies in practices of TBAs include; lack of running water, wearing of protective clothing to take deliveries and deficient sterilization process such as the non-use of bleach in soaking their instruments. The difference in findings with this study may be due to study setting and educational level attained by the TBAs. In current study, higher proportion had at least secondary education while in others it was primary education and below.

The good news is that training have been shown to positively improve their knowledge, practice and performance on PMTCT. For instance, a study in Southwest Nigeria, demonstrated that HIV/AIDS training succeeded in improving the level of knowledge and some practice on PMTCT of TBAs ²⁸. A study on Integration of traditional birth attendants into PMTCT at primary health facilities in Kaduna, North-West Nigeria showed an increase from 200 pregnant women across all the 25 health facilities monthly at pre-integration era to an average of 1500 pregnant women per month post-integration era. This indicates the need for TBAs to be integrated, rather than alienated, from PMTCT services. Other similar studies advocated adoption of modern practices through regular training to reduce MTCT of HIV ^{16,29,30}.

Current study reported that almost all the TBAs agree that they have a role in PMTCT for their clients and babies, however less than a quarter of them were willing to collaborate in the PMTCT programme. Equally only a third refer positive mothers for PMTCT services to Health Facilities. This is dangerous since PMTCT interventions can reduce HIV transmission rates from about 45% to less than 5% during the perinatal and postnatal period ³¹. ANC services serve as the first point of contact for pregnant women to engage with the health system and access other services such as HIV testing and PMTCT if diagnosed as HIV-positive ³². This implies that access to health care for pregnant women must be prioritized because an effective ANC program can be used to deliver and improve uptake of PMTCT. In

a study in Zimbabwe, more than 85% of women agreed that TBAs could participate in all activities related to a PMTCT programme with the exception of performing a blood test for HIV though there were concerns regarding confidentiality of the HIV-serostatus of women. The same study suggested that PMTCT programmes will benefit from complementary approaches to prevent missed opportunities by involving TBAs. However, there is need to reinforce their knowledge on MTCT prevention measures and better integrate them into the health system³³.

Leaving, ANC and PMTCT for health facility staff or skilled attendant may be detrimental since higher proportion of deliveries are not overseen by them especially in rural communities where most are done by TBAs. Findings from the 2018 NDHS showed that 66% of births to urban mothers and 29% for rural were assisted by a skilled provider. Also 61% and 26% deliveries were in health facilities in urban and rural areas respectively.³⁴ The 2016 Nigeria Multiple Indicator Cluster Survey (MICS) showed that over two-thirds of women registered for ANC in health facilities but over half of these deliveries were home-based in rural areas. PMTCT coverage was barely 30% in Nigeria in 2013 indicating high unmet need for MTCT services^{35,36} due to barriers to uptake of PMTCT which include distance to health facilities, poor attitude of healthcare workers, stigma, poverty and unavailability of services^{37,38}. These underscores the need for scaling up services using TBAs. In line with findings on collaboration from this study, another study reported that more than 75% of TBAs agreed to participate in most PMTCT activities with the exception of performing a blood test (17%), accompanying new-borns to closest health centre to receive medication (15%) and assisting health centres in documentation of the link ANC-PMTCT services (18%)³⁹.

This study found that there were no significant associations of clients' characteristics with overall knowledge on HIV but with practice and willingness to collaborate. Also good knowledge and good practice were determinants of willingness to collaborate in the PMTCT programme. Similar to finding in this study, a study on TBAs in Delta state, Nigeria those who had good knowledge on HTS were more likely to adopt good preventive practices against MTCT including offering HIV testing to their clients¹⁹. A study in Taraba State, North-east Nigeria concluded that TBAs had good knowledge on MTCT of HIV and good level of safe practices. It also noted that knowledge on MTCT was positively associated with the practice of HIV counselling and testing⁴⁰.

The main reasons for the objection to collaborate from current study were fear for loss of patients and money, claim that they can manage it themselves, clients will not like to go to hospital and poor knowledge on where to refer them. For those willing to collaborate almost

all will allow their patient's care be taken over in the hospital if need be. Previous study reported that findings show socioeconomic and sociocultural factors as the biggest barriers to the success of PMTCT programmes³⁸. Similarly, in Anambra state, major challenges include low education level, reluctance to refer HIV positive patients in absence of incentives, poor reporting mechanism and poor-quality assessment/supervisions⁴¹. In Malawi, the challenges militating against providing PMTCT services included lack of transportation for referrals, absence of a reporting system to confirm the woman's arrival at the health center and non-disclosure of HIV status by patients to the TBAs. In fact, in Malawi role of TBAs working has evolved over time, currently their primary role of TBAs is to provide community education and refer women to health centres in addition to performing deliveries due to challenges with referrals and transportation, deliveries in the country. Researchers and scholars opined that TBAs when trained and well-supervised, can supplement efforts to provide PMTCT services in communities⁴².

In support of findings from current study, previous studies have shown that involving TBAs in HIV prevention and PMTCT programs could reduce HIV infant infection⁴³. For example, a study in rural Lilongwe described TBAs as being important members in the community based on their service delivery⁴⁴. In Cameroon, TBAs dispensed Nevirapine (NVP) to HIV positive mothers and ensured that newborns receive postpartum NVP prophylaxis as part of an integrated strategy in the PMTCT program⁴⁵. Nonetheless, In Thyolo, Malawi, HIV pregnant women who delivered with TBAs were contacted and all reported their infants failed to receive NVP, suggesting a critical gap in PMTCT⁴⁵. National plans on accelerated PMTCT and elimination of MTCT currently advises that TBAs be integrated into formal health centres to further reach target population and cover the PMTCT gap in Nigeria.

CONCLUSION

Current study demonstrated that TBAs had good overall knowledge on HIV but poor overall practice. Almost all the TBAs agree that they have a role in PMTCT however limited number were willing to collaborate in the PMTCT programme. For those willing to collaborate, they have full support. Age, education and good knowledge influenced overall good practice. Also good knowledge and good practice influenced willingness to collaborate in the PMTCT programme. TBAs are an important but currently underused resource for PMTCT scale-up in Nigeria. Thus, enhanced effort and strategic approach is encouraged to meaningful engage TBAs for PMTCT services to aid control of HIV/AIDS.

Declarations

Ethics approval: Ethics approval and consent to participate was received from Health Research Ethics Committee (HREC) of University of Nigeria Teaching Hospital, Ituku-Ozalla Enugu. Consent to participate was given by the respondents.

The consent statement in the Ethics approval: “The research project on the above topic was reviewed and approved by the University of Nigeria Teaching Hospital Health Research Ethics Committee. The certificate is valid for one year from date of issue. Please note that the Committee Reserves the Right to monitor the Conduct of the study at any time for strict Compliance to the Protocol.”

Informed consent was obtained from all the participants and/or their legal guardians.

Consent for publication: Not applicable

Availability of data and materials: the data is available on request

Competing interests: There are no competing interests

Funding: there is no funding as the research was funded by the authors

Authors' contributions: All the authors participated materially in this research and article preparation. AUE conceived the study, designed the study, and did the literature search and review. ECA did the analysis and interpretation of data, and revised it critically for important intellectual content, Both authors partook in the study's design, acquisition of data, drafting of the article/manuscript, and revising the article as well as final approval of the version to be submitted.

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