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An Assessment of Prevention of Mother to Child Transmission (PMTCT) of HIV Services in Gombe State, Nigeria

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Abstract:
Transmission of HIV from mother to child continues to be the major source of HIV infection among children under the age of fifteen. Therefore, targeting pregnant women attending antenatal clinics provides a unique opportunity for the implementation of prevention of mother-to-child transmission (PMTCT) intervention program against HIV infection of new-born babies. This study was aimed at assessing the Mother to Child Transmission of HIV intervention and the follow up of exposed infant HIV testing in nine selected health facilities in Gombe state between January 2016 and December 2016. The methodology used was a non-experimental descriptive study that combined hospital record review and structured questionnaire to collect relevant data. A cross-sectional retrospective evaluation of women enrolled in Prevention of Mother to Child Transmission of HIV programme at facilities supported by an indigenous partner (Centre for Integrated Health Program - CIHP), was carried out. In addition, structured questionnaires were served on 498 ANC attendees and service providers, selected by consecutive sampling method. Data entry and analysis were done using SPSS version 21. The study showed that there was adequate coverage with PMTCT services in the study area as all the respondents affirmed to accessing all expected services in all the facilities. Pregnancy was found to be an automatic indicator (469, 94.2%) for HIV test and therefore ANC served as a critical window for the provision of PMTCT services. Mother-to-child transmission remained a major route of HIV transmission in children with 12 (2.4%) cases of HIV in infants at 6weeks DNA PCR test and 5 (1.0%) cases of HIV-positive in children after the Rapid test at 18 months. Hence, it is recommended that there should be a scale-up of the programme, pre-natal sensitization of women, baby positioning and attachment for safe and effective breastfeeding, ensuring prompt (within 28 days) availability of DNA/PCR test results and adopting consensus method for the assessment of PMTCT.

Keywords: *ANC, assessment, HIV, PMTCT, CIHP, pregnant women*

1. Introduction

Children living with HIV have been known to face the highest risk of AIDS-related deaths when compared to other age groups (Unicef, 2016). As at 2019, there were 38.0 million people living with HIV (UNAIDS, 2020). Out of these 36.2 million were adults, while 1.8 million were children 0–14 years. HIV is transmitted from an infected person to an uninfected person by two major modes, namely, horizontal transmission and vertical transmission (or mother to child transmission MTCT)) (Mark, Crepaz, Jansen 2006; Federal Government of Nigeria 2002).

Prevention of mother to child transmission (PMTCT) is a global interventional program initiated by the United Nations Organization to protect the children of the world from the scourge of the HIV pandemic, (UNGASS, 2002). The target is to have mother to child transmission eliminated and to substantially reduce AIDS related maternal deaths. The reduction of the impact of HIV/AIDS on women and children is the rationale for strengthening the programme for the prevention of mother to child transmission. The AIDS-response must focus on solutions for this extremely vulnerable population in preventing new infections, but also testing and starting treatment early are the best ways to end AIDS among the youngest children. Mother to child transmission of HIV greatly place our future generation at high risk of disabilities and reduced their life span. In an age where the tools and knowledge are at hand to prevent and treat HIV in children, yet new infections and deaths among this age group is a reflection of our collective failure to prioritize children as our future generation (UNICEF 2016).

Acceleration of treatment for all pregnant and breastfeeding women living with HIV is still needed to achieve elimination of new infections among children and half HIV related deaths among pregnant women and new mothers, (Unicef 2017). At the turn of the century, and the beginning of the Millennium Development Goals, an HIV diagnosis was equivalent to a death sentence for most children and their families in low-income countries. But, an early diagnosis paired with treatment and care can ensure long healthy lives, regardless of location, and can help prevent transmission of HIV to

others. The global community is optimistic that an end to the AIDS epidemic is possible. The UNAIDS Gap report of 2014 boldly admitted that 'we are at the beginning of the end of AIDS,' (UNAIDS, 2014). Global data supports this optimism and shows progress in reduction of new infections among adults and children. In 2013, 240,000 (210,000–280,000) children were newly infected with human immunodeficiency virus (HIV). This is 58% lower than in 2002, the year with the highest number, when 580,000 (540,000–640,000) children became newly infected with HIV. Although slower than other regions, sub-Saharan Africa which is the region hit worst by the HIV epidemic is also showing some progress in the decline of the disease, (UNAIDS 2014).

Prevention of mother-to-child transmission initiative is critical in the fight against paediatric HIV infection and it is also a major public health concern. It is a comprehensive public health approach that is aimed at the wellbeing of all women of reproductive age, provision of HIV screening for all women, prevention of new infection among infants born to HIV positive mothers and also provision of management for HIV positive mothers. It is also the prevention of vertical transmission of HIV from father and mother to the child which remains the major route of transmission in children (Adane, 2012). The strategy covers a wide area of HIV-related intervention needs of pregnant women, their children and families. As defined by UNAIDS, this strategic approach involves four components:

- Primary prevention of HIV infection among women of reproductive age.
- Prevention of unintended pregnancies among women living with HIV.
- Prevention of HIV transmission from mothers living with HIV to their infants.
- Provision of care, treatment and support for mothers living with HIV, their children and families.

The integrated reproductive health services for People Living with HIV requirement must have to address their fertility intentions, (Crankshaw, Mattews and Bangsberg, 2012). They require behavioural and pharmacological strategies that will reduce the risk of infection in their children, (Bekker, et al., 2011; Matthews, et al., 2010; Matthews & Mukherjee, 2009). Such strategies include home artificial insemination for couples where the woman is HIV-infected, unprotected sex limited to peak of fertility, (Bekker, et al., 2011); male circumcision for couples where the male partner is HIV-uninfected, antiretroviral therapy, (Cohen, et al., 2011); pre-exposure antiretroviral prophylaxis, (Baeten, et al., 2012; Thigpen, et al., 2012; Van Damme, et al., 2012; Grant, et al., 2010).

2. Materials and Methods

2.1. Study Area and Setting

Gombe State – Jewel in the Savannah, is one of the 36 States of the Federal Republic of Nigeria created on October 1st, 1996 out of the former Bauchi State. It is located in the center of North-Eastern Region of the country, sharing boundaries with 5 States (Bauchi, Adamawa, Borno, Yobe and Taraba). Based on the 2006 census figure and projected growth rate of 3.2%, the current State population is 3,241,592 comprising of 47.4% males and 52.6% females, while young people (10-29 years) constitute 39.9% of the population. Women of reproductive age comprise of 1,452,233 (44.8%). There are 11 Local Government Areas (LGAs) in the State: Akko, Balanga, Billiri, Dukku, Funakaye, Gombe, Kaltungo, Kwami, Nafada, Shongom and Yamaltu-Deba with 114 wards. The State is multi-ethnic with a dynamic cultural heritage. The different ethnic groups in the state include; Waja, Fulani, Tangale, Bolewa, Kanuri, Hausa, Jara, Tula Cham, Lunguda, Pero, Jukun, Tera, Dadiya, Awak, Kamo, Yoruba, Igbo and others.

In Gombe State, Prevention of Mother to Child Transmission of HIV (PMTCT) service coverage based on spectrum projection increased from 15% in 2010 to 36% in 2015 while 59% of the HIV positive pregnant women received ARV prophylaxis in 2015 (CIHP Report, 2010-2015). Of the 3902 exposed babies 1, 017 (26%) of estimated (spectrum) HIV exposed infants accessed ARV prophylaxis.The site offering some form of PMTCT HIV services were 214 in 2015 and in 2016 there 215 PMTCT sites. Most of the sites were involved in only testing and referral of HIV positive women. The Prevention of Mother to Child Transmission of HIV coverage in the state stood at 16% in 2014, 17% in 2015 and 21% in 2016. This increase though not good enough is attributed to the availability of Anti-retroviral drugs and other consumables particularly in comprehensive PMTCT sites supported by implementing partners.

2.2. Study Design

This is a non-experimental, descriptive cross-sectional study. It is a cross-sectional retrospective assessment of women enrolled into PMCTCT of HIV programme at the facilities supported by an indigenous partner (CIHP), adopting a surveillance and survey approach. Records of all the mothers and their exposed children were reviewed. Information was also obtained through questionnaire administered on the HIV-positive women who participated in the PMTCT programme of the selected facilities. Nine (9) health facilities were carefully selected that are engaged in different PMTCT services (all of them are secondary and primary health facilities). The facilities are spread across the state. A list of all the facilities in the state was first drawn. All those supported to provide comprehensive PMTCT services were identified for the self-administered questionnaire and interview in 9 of the health facilities for the study. The health facility record data review covered between January 2016 and December 2016, while the interview data collection spanned through March-June, 2018.

2.3. Population of the Study

The study population was made up of all 623 HIV positive women who attended Antenatal care (ANC) services in the nine supported facilities from January 2016 to December 2016. The women included those who presented themselves for their first visit for the antenatal care and those coming for subsequent pregnancies. Also included in the study

population were health care providers who were directly involved in the provision of care to the primary study population, namely, women attendees of the health facilities selected for the study.

2.4. Sampling Technique and Sample Size

The sample size is made up of 498 HIV positive women in all the nine supported sites. A purposive sampling technique was used to pick eighty percent (80%) of the 623 HIV positive women and care providers for this study (Isangedighi et al, 2004). All clients that enrolled for the PMTCTHIV programme and their care providers in all the facilities were first identified and the selection proceeded as follows;

- All nine (9) of health facilities that were supported to offer comprehensive PMTCT HIV and referral services were picked.
- Out of the 623 HIV-positive women that were tested in the 9 supported PMTCT HIV sites 80% were purposively selected.

2.5. Method of Data Collection

Research assistants were briefly trained and used for the collection of data from the various health facilities across the state. A check list of the variables of interest was prepared and supplied to the research assistants. Ante-natal clinic (ANC) cards and referral booklets were perused. Questions centred on antenatal care, labour and prevention of mother to child transmission of HIV, HIV testing and counselling, the assessment of clients and care providers during meeting hours and also key questions were asked to fill the gaps that were noticed during data collection. Bias and duplication of responses were avoided. Each of those positive pregnant women identified for the study were mobilized to come to infant welfare clinic on their scheduled visit day. It was at the infant welfare clinic visits that the respondents were served with the questionnaire and were guided in answering. Those literate completed and submitted to the research assistants. The care providers as well were served with the questionnaire and they responded accordingly.

2.6. Method of Data Analysis

All the data analyses were conducted using the SPSS statistical package version 21. Summary indices were developed to measure need for services and evidence of a supportive environment for priority services. Relevant data on services and outcomes documented for mothers and babies were assessed from the follow-up interviews conducted with the mothers that were seen in the 9 supported PMTCT HIV sites in the year 2016. Rates were computed for the major variables pertaining to the mother and child. Proportions reflected the level of performance in the intervention processes adopted in the supported sites.

2.7. Ethical Approval

An ethical clearance and approval was secured from the Gombe State Ministry of Health research and ethics committee. Written consents of the respondents were also obtained before embarking on the study.

3. Results

Prevention of mother to child transmission (PMTCT) HIV services offered in the nine health facilities include testing and counselling, or testing, counselling and referrals, or testing, counselling, and administration of ARVs (The table 1). The main PMTCT service provided was HIV Testing, counselling and ART (77.7%), followed by HIV Testing, counselling and referral of positive women for ART (21.5%).

Types of PMTCT Services Offered in Health Facilities			
HIV information and education only	HIV Testing and counselling only	HIV Testing, counselling and referral of positive women for ART	HIV Testing, counselling and ART
3 (0.6%)	1 (0.2%)	107 (21.5%)	387 (77.7%)

Table 1: Prevention of Mother to Child Transmission of HIV Services Offered in the Facilities (n=498)
Source: Field Survey, 2018

Figure 1 depicts HIV testing in pregnancy, acceptance to test by pregnant women and the use of national guidelines in the provision of services. It shows that as stipulated in the national guidelines, though pregnancy is an indication for HIV testing, the pregnant women were given the option to opt out. However, the chart shows that women were willing to test, knowing that it is only when they know their status that they can access other HIV services.Table 2 shows HIV testing for women indicating the various places where HIV testing can be done. HIV testing in Nigeria is integrated in all the various departments where client go to consult a doctor, to ensure that every client is given the opportunity to know their HIV status. To ensure that pregnant women are not left out, the table demonstrate that testing occur both at the Ante natal clinic by health workers involved in Prevention of Mother to Child Transmission of HIV services or by lab scientist/technicians. Wherever the pregnant woman finds herself, she has the opportunity to be tested as long as she agrees.

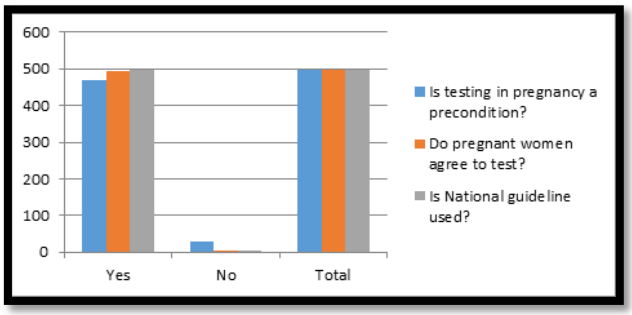

Figure 1: HIV Test in Pregnancy, Acceptance and Use of National Guidelines (N=498)
Source: Field Survey, 2018

Where Does HIV Testing for Pregnant Women Take Place			
On site at the ANC clinic	At the facility laboratory by scientist and technician	At the maternity ward	All of the above
227 (45.6%)	39 (7.8%)	13 (2.6%)	219 (44.0%)

Table 2: Place of HIV Testing for Pregnant Women (n=498)
Source: Field Survey, 2018

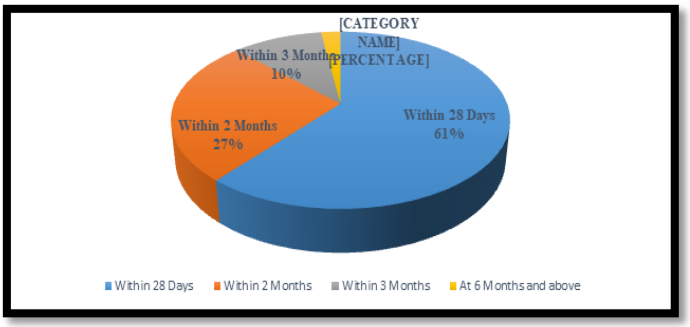

Figure 2: Time of Getting DNA/PCR Results (N=498)
Source: Field Survey, 2018

Figure 2 titled 'Time of getting DNA/PCR result shows the time spent before clients get the result of their infant DNA polymerase chain reaction result. The finding demonstrates that majority (61%) of clients get their DNA/PCR result within 28 days while small a fraction (2%) get at 6 months and above. Getting the result on time is a good motivator to any woman who went through PMTCT. The result helps them to know the benefits of their engagement into the program. Therefore, if it takes too long to have the result, the waiting time can create undue anxiety to the mother.

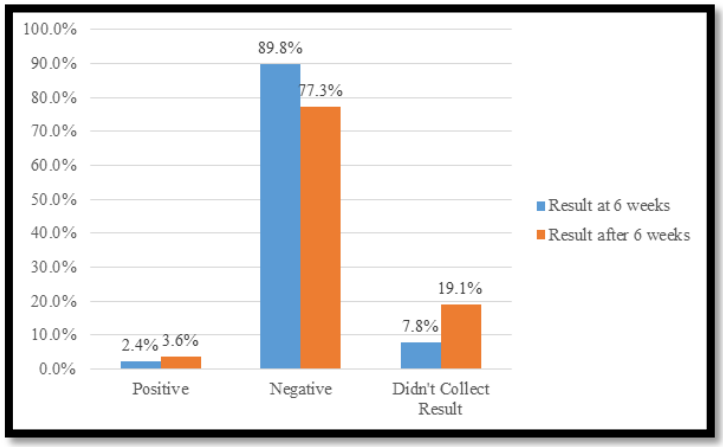

Figure 3: DNA/PCR Test at and after 6 Weeks (N=498)
Source: Field Survey, 2018

Figure 3 titled 'Test result at and after 6weeks' of cessation of breast feeding demonstrates the clients that had their DNA/PCR test at 6weeks and after 6weeks of stopping breast feeding. It shows that at 6 weeks 2.4% (12/498) had positive results, while after 6 weeks up 3.6% (18/498) had positive result. On the other hand at 6 weeks 7.8% (39/498) admitted they didn't collect their result and after 6 weeks a relatively higher percentage (19.1%, 95/498) didn't collect.

At What Stage of Your Pregnancy Were You Given ARV? (n=498)			When Did You Get Your Result after Testing? (n=498)		
I was on treatment before ANC	Immediately I tested positive to HIV	After CD4 cell count was done with CD4 less than 500	Same day	Within few days	At the next ANC visit
106 (21.3%)	377 (75.7%)	15 (3.0%)	475 (95.3%)	19 (3.8%)	4 (0.8%)

Table 3: Commencement of ARV and the Time Client Got Their Result after Testing
Source: Field Survey, 2018

Table 3 show the commencement of ARV and the time the client got the result after testing. The finding described the responses by pregnant women of the stage of their pregnancy when they started ARV. Overwhelming majority (95.3%, 475/498) of the women got their HIV test result the same day their samples were taken. A good proportion (75.7%, 377/498) of the respondents affirmed that they were given ARV 'immediately I tested positive to HIV'

Did You Inform Your Partner to Go For Testing When You Tested Positive? (N=498)		If No What Was Your Reason for Not Informing Him (n=38)			
Yes	No	I am afraid of his reaction	I am afraid of being devorced	I am not ready to tell him yet	Since I am positive, it also means he is positive
461 (92.6%)	37 (7.4%)	11 (31.6%)	4 (10.5%)	9 (23.7%)	13 (34.2%)

Table 4: Client Response to Whether They Inform Their Partners When They Tested Positive and Reasons for Not Informing Their Spouses
Source: Field Survey, 2018

Table 4 revealed that most (92.6%, 461/498) of the client claimed they informed their partners when they tested positive. This of course is good because HIV infection is a life long illness and clients need all the support to live positively with the infection. On the other hand a good proportion of the HIV positive women who didn't inform their husband of their status indicated 'since I am positive, it also means he is positive' ((34.2%, 13/37) or 'I am afraid of his reaction' (31.6%, 11/37) as their reason for non-disclosure to their spouse.

Was Your Child Given Nevirapine Prophylaxis Within 72hours Of Delivery? (N=498)		If no why? (n=21)			
Yes	No	I delivered at home and did not bother to take him/her to the hospital	The drug was not available in the hospital	I am not aware that he needs it	I don't know if he was given
477 (95.8%)	21 (4.2%)	12 (57.1%)	2 (9.5%)	5 (23.8%)	2 (9.15%)

Table 5: Administration of Nevirapine Prophylaxis to Children
Source: Field Survey, 2018

Greater majority (95.8%, 477/498) of the clients affirmed that their infants were given Nevirapine Prophylaxis within 72 hours of delivery thereby demonstrating availability of drugs and administration according to the guidelines by service providers. More than half (57.1%, 12/21) of the few who said their infants were not given Nevirapine indicated 'I delivered at home and did not bother to take him/her to the hospital'.

Was Your Child Initiated on Cotrimoxazole within 6-8 Weeks of Birth?		What Motivated You to Test for HIV?			
Yes	No	I was encouraged by a positive mother who had a negative baby	The health education by the health workers	Information from the social media	Fear of infecting my child
483 (97.0%)	15 (3.0%)	97 (19.5%)	335 (67.3%)	27 (5.4%)	39 (7.8%)

Table 6: Child Initiation on Cotrimoxazole and Reasons by Women for HIV Test
Source: Field Survey, 2018

On child initiation on Co-trimoxazole and reasons given by women for HIV test (Table 6) most (97.0%, 483/498) of the children were initiated on Cotrimoxazole at 6-8weeks of birth. Considering the immature immune system of the infant, measures need to be taken to prevent any opportunistic infection of which pneumonia is the commonest. The main reason given as motivated you to test for HIV by the respondents was the health education given by health workers at ANC

(67.3%, 335/498). This demonstrated the commitment of service providers to ensure that all pregnant women get the information that they need to avail themselves for test.

Are you satisfied with the services?		**If not satisfied in what way are you not satisfied?**			
Yes	No	Attitude of health care workers	Lack of availability of ARV for her and her baby	DNA test result of infants not given on time or not given at all	Lack of transportation to come for follow up
475 (95.4%)	23 (4.6%)	3 (13.0%)	12 (52.2%)	4 (17.4%)	4 (17.4%)

Table 7: Service Satisfaction
Source: Field Survey, 2018

Table 7 titled 'Service satisfaction' these responses by clients shows their opinion of the services being rendered at the various PMTCT sites. Most of the clients said they are satisfied (95.4%, 475/498), which is why most of them agreed to test and took their ARVs. Only a few said they were not satisfied (4.6%, 23/498) and more than half (52.2%, 12/23) of whom said it was due to 'lack of availability of ARV for her and her baby'.

4. Discussion

4.1. Prevention of Mother to Child Transmission of HIV Services Offered

Respondents in this study identified services offered to include: HIV counselling, testing and treatment (77.7%, 387/498), HIV counselling, testing and referral of HIV positive women for treatment(21.5%, 107/498), HIV information and education only (0.6%, 3/498), HIV testing and counselling only (0.2%, 1/498). The main basis for any PMTCT programme is to provide counselling to clients, tests them and if found positive to place them on treatment immediately and that was what most of the facilities were virtually doing. All the facilities were supposed to be involved in comprehensive services. However, at a stage the supporting partners decided to designate some facilities to test, counsel and refer their clients for treatments. The importance of these services cannot be overemphasized. Meanwhile, PMTCT HIV service is supposed to be a comprehensive public health package as observed from the number of services identified and offered in this study (Adane, 2012). The services are comprehensive in the sense that it is aimed at the wellbeing of all women of reproductive age, provision of HIV screening for all women, prevention of new infections among infants and the provision of management. The services also being a wide area of HIV-related intervention needs to address fertility intentions, behavioural and pharmacological strategies, (Bekker, et al., 2011). The current finding seems to be a deviation from what Ngidi, et al., (2017) reported, looking at the programme in the Sub-Saharan Africa. They reported that the services are offered as health services delivery, community-based intervention and health system services.

It is noted that countries have prioritized the elimination of mother-to-child transmission by recommending lifelong antiretroviral treatment for HIV-pregnant and lactating women, (Goga, et al., 2018). It is as a result of this that the services are available in Gombe. In spite of these services and those reported in the literature, the implementation of Prevention of Mother to Child Transmission of HIV in Africa is said not to be homogenous, resulting in many women not having access to appropriate intervention (Adetokunboh and Oluwasanu, 2015). Some countries have good moderate healthcare system and national policy that were yielding result while others were not doing well including Nigeria.

Reporting from Malawi, Van Lettow et al(2018) asserts thatthe elimination of HIV infection is recognized to depend on the Prevention of Mother to Child Transmission of HIV services. Unfortunately, young women and adolescents girls are particularly prone to missing antenatal HIV testing. They can start ART but will always miss infant HIV testing. Many women miss HIV diagnosis during the index pregnancy and these were associated with a relatively high Mother to Child Transmission ratio. Therefore, high number of infections in Malawi, Nigeria and Zimbabwe were attributed to those women that were not on the services especially ART, (McCarthy, et al., 2017).Effective Prevention of Mother to Child Transmission drugs alone are said not to be enough to prevent transmission (Phanuphak and Phanuphak, 2016) but requires effective mother-to-child infrastructure and collaborative management programme. Nigeria is said to have low-coverage of intervention and adherence contributing to high transmission rate (Sam-Agudu, et al., 2014). The rural areas have poor indictors of Prevention of Mother to Child Transmission coverage. The findings from the study showed that not all the facilities were involved in comprehensive HIV activity. However contrary to a study conducted by Elizabeth Glassar, Paediatric Aids Foundation (EGPAF, 2013) while assessing 40 facilities involved in PMTCT intervention services in Lesotho, reported that there was 100% achievement in coverage. This is contrary to Gombe where out of the many facilities that are supported by NGOs not all were involved in comprehensive service delivery; although majority offered most of the services.

4.2. HIV Test in Pregnancy, Acceptance and Use of National Guidelines

HIV testing is a gateway to access all other HIV services. The pregnant woman needs to know her HIV status. This is done only through testing. This study demonstrates that 94. 2 % (469/498) agreed that pregnancy is an indication for HIV testing. This is interesting because in order to prevent new pediatric infection, mothers must agree to be tested for HIV. This finding demonstrated that most of the women are fully informed that it is unacceptable for Gombe state to have a woman go through pregnancy without being tested for HIV. In line with the awareness that pregnancy is an indication for

HIV testing, 99.4% (495/498) of the women accepted to be tested. This again shows the level of awareness and willingness by women to have healthy babies. The women know that for them to access any form of HIV related services, knowing their status serves was the gateway.Women responded to the fact, as provided in the National Guidelines, that pregnancy was an indication for them to be tested for HIV infection. All the pregnant women were qualified for the HIV screening as long as they were available for the ANC services. Understanding this fact therefore, almost all the women agreed to the test and were tested. This also explained compliance with the National Guidelines in all the facilities.

The finding shows that the facilities are using the National guideline which uses the opt-out approach. The guideline encourages every pregnant woman to know her HIV status before delivery, but they have the right to refuse to test which should not deny them any form of services from the health facilities. However, health care providers are enjoined to keep publicizing the benefits of women knowing their status throughout pregnancy, delivery and even during breast feeding period in order to prevent new pediatric infections. As reported by AVERT, (2017) the women in this group responded very well and precisely for their health and the health of their children and the society generally. In the AVERT study, HIV in the blood of the woman living with HIV could pass into the baby's body therefore making it necessary for the pregnant woman to quickly know her status and resume treatment. The women in this study have understood this very well leading to the good number that accepted to be tested so that they start treatment immediately to avert transmission. The current study agrees with WHO' s observation that Ante Natal Care provides the pregnant woman the opportunity to have HIV test which should be carried out at the first visit so the woman is started on treatment straight away, if tested positive, to avert the high risk of transmission. The same woman will also enjoy post exposure treatment at any stage of pregnancy or breast feeding, (WHO, 2017). For a woman who is pregnant, transmission is very likely, therefore the woman automatically qualifies for test and treatment if found positive. As long as the pregnant woman receives adequate treatment, new infections of children become rare, (Fact Sheet 612, 2014).So pregnancy as a pre-requisite, like in this study, and offering self for test helps reach out the HIV-pregnant woman with medicines, (NACA, 2014). Testing has become highly recommended, to all women to help prevent mother-to-child transmission. If the woman enjoyed suppressed viral load throughout pregnancy, she reduces the risk of transmission to her infant (Aids map, 2017). The woman needs this because a high viral load at any time in pregnancy raises the risk of transmission.

In a related study Ibrahim, Mohammed and Umar (2016) assessed the knowledge and factors influencing the utilization of Prevention of Mother to Child Transmission of HIV services in Abubakar Tafawa Balewa, University Teaching Hospital (ATBUTH), Bauchi. They opined that acceptability of HIV testing by pregnant women is the key passport or entry point for all HIV prevention intervention including Prevention of Mother to Child transmission program. The major obstacle to the program they identified included inadequate antiretroviral, adherence and follow-up during pregnancy and particularly in the postpartum setting. Again, findings from this study are similar to a study conducted by Elizabeth Glasser pediatric AIDS foundation (EGPAF, 2013) in which prevention of mother to child transmission of HIV services, were assessed in Lesotho. Pregnant women were either tested for HIV in ANC (78 %) or knew their HIV status before ANC. 82 % of the HIV positive pregnant women attending ANC received Prevention of Mother to Child Transmission of HIV interventions. The researcher decided to ask if Pregnancy was an indication for HIV test and if women agree to test. This question was asked because in some facilities pregnant women were tested without their permission which is contrary to the National guidelines. The finding demonstrated that women knew that they need to know their HIV status while pregnant so as to protect their unborn babies and willingly agreed to be tested.

4.3. Place of HIV Testing for Pregnant Women and Time of Getting DNA/PCR Results

Regarding place of HIV testing (Table 2), the Ante Natal Care clinic provided the needed avenue for HIV testing to all the women and since pregnancy is an indication for screening and initiation for treatment the availability of tests needed to be all round.Since HIV testing is an integrated service, the study sought to find out where the women are tested when they come to the hospital. Findings indicated that 227 (45.6%) of the population said they were tested at the ANC, 39(7.8%) said they were tested by technicians, while 219(44.0%) claimed they were either tested at the ANC, facility laboratory or at the maternity ward. The findings demonstrated that testing services were available to women at every point of care. This helped to ensure that no woman goes through the process of pregnancy or delivery without knowing her HIV status which is the gateway to access other HIV services. HIV testing is integrated in all the various departments where client go for consultation. The study further sought to find out the time it takes for DNA/PCR results to be released (Fig 2). The findings showed that 304 (61.0%) got their result released within 28days of the test, while, 132(26.5%) received their results within 2months. Another 51(10.2%) received their result within 3months and yet another got their results in 6months. The findings demonstrated that the facilities under study actually took the blood sample of newborns and got the results released. Majority (61.0%) of the respondents actually got their result within 28days of taking the sample which is good. Getting the result on time will motivate the mother to continue in care especially if the result is negative. Where the baby is positive the baby will be initiated on treatment immediately. According to a study conducted by Elizabeth Glasser pediatric AIDS foundation (EGPAF 2013) while assessing the Prevention of Mother to Child Transmission of HIV services in Lesotho, all the health facilities assessed collected dried blood spot (DBS) for all HIV exposed infants by 6 weeks of life using DNA/PCR. 76% received the DNA/PCR results and those found positive were started on ART. This goes a long way to demonstrate the importance of DNA/PCR test in any HIV services. However, contrary to a study conducted by Ojukwu (2014) in Juba university teaching Hospital on the utilization of Prevention of Mother to Child Transmission of HIV services, all HIV exposed infants did not have PCR/DNA done; there was high possibility that some of the infants are still on prophylaxis when they could actually be put on treatment.

4.4. DNA/PCR Test at and after 6 Weeks

The result of DNA/PCR test at and after 6 Weeks determines the type of transmission the child suffered (Fig 3).While appreciating the various known routes of HIV transmission from Mother to Child, the researcher felt that for the state to have zero new infections, it need to be strategic in its approach in efforts to Prevent Mother to Child Transmission of HIV. This informed the need to ask if exposed infants' blood sample was usually taken for DNA/PCR test at 6-8 weeks of birth and after 6 weeks of cessation of breast feeding. The DNA/PCR test detects the HIV antigens and if present it means the child got infected in the uterus. Findings of this study demonstrate that 2.4% of the 498 exposed children turn out positive at 6 weeks of birth. This means they were infected in uterus. The mothers of the infected babies were further interviewed to find out what happened during pregnancy and delivery. Five of them said they started ANC at 30 weeks of gestation while the remaining seven claimed they had prolonged labor. All this could have contributed to HIV in their child. Having positive children even after being involved in Prevention Mother to Child Transmission of HIV intervention services is not new. However, measures can be taken to reduce it. Elizabeth Glasser Pediatric AIDS foundation (EGPAF 2013) also found that out of the 76% of newborn who had DNA/PCR at 8 weeks 4% turned out positive and were started on treatment. The findings from this study further showed that 18 babies were found positive after 6 weeks cessation of breast feeding (Fig 3). Majority (66.7%, 12/18) were positive at 6 weeks of birth. This shows the need to target all women of child bearing age to know their HIV status before getting pregnant. Women should equally be encouraged to start ANC early so as to know their HIV status and if found positive they should be started on ARV. During labour the use of partograph should be adhered to in order to prevent prolonged labour and its consequences. Also, attention needs to be paid on breast feeding. We need to focus on positioning of the baby to the breast and its attachment to ensure that there are no fissures on the nipple that will serve as a route to infect the newborn baby during breast feeding. DNA test result at 6weeks of delivery and 6weeks after cessation of breast feeding usually shows the route of transmission. From the finding it shows that 12 babies turned out positive at 6weeks of delivery. This means more need to be done to encourage women to start ANC on time.

4.5. Commencement of ARV and the Time Client got their Result after Testing

Table 5 presents the picture of the time of initiation of treatment on all the women in this study. Ccommencement of ARV and the time client got their result after testing is an important factor in the intervention programme and the study sought to know from the women when they started treatment. Administration of Anti-Retroviral drugs is a key component of Prevention of Mother to Child Transmission of HIV. The women were asked the stage at which ARV was given to them. 377 (75.7%) of the participants said they were given ARVs immediately they tested positive. This was in line with the policy of test and treat so that no HIV positive woman will be missed. Experience has shown that if they are allowed to go without treatment immediately, some of them do not come back. 106 (21.3%) said they were already on treatment before ANC. While, only 15 (3.0%) said they had CD cell count done before they were placed on treatment. It can be observed that the women either used ARV for their own health or during ANC. This agrees with Siemieniuk et al, (2017) who observed that approximately 1.4 million women living with HIV become pregnant every year. Most of them use antiretroviral therapy to reduce the risk of vertical transmission, or for personal reasons.

Similarly Naburi (2017) was looking at satisfaction in clients and others in the implementation of Prevention of Mother to Child Transmission where it is reported that majority of the women (81%) had known about their HIV status for at least one year, and had even disclosed it to one family member. With regard to the time the client got their results 475 (95.3%) said they got their result the same day. Getting result the same day reduces fear and anxiety on the part of the women. It also helps the service providers to intervene immediately. 19 (3.8%) said they collected the result within few days while only 4 (0.8%) said at the next visit. The finding shows that most clients got their result on the same day and were commenced on ARVS as stipulated in the national guidelines. Again, if results are not given on the same day some of the client may never come back. Therefore if a client is positive and does not get result on the same day and does not return to collect it later, it becomes a missed opportunity. The researchers sought to know at what stage clients were started on treatment to help identify if the current PMTCT service actually identified positive women during the current pregnancy. Of course findings indicated majority of the women were diagnosed positive and placed on treatment the same day.

4.6. Client Response to Whether They Inform Their Partners When They Tested Positive and Reasons for Not Informing Their Spouses

Partner notification is another very important aspect of HIV treatment, care and support. Majority of the client 461(92.6%) said that they inform their partners when they tested HIV positive (Table 4). And along the line one will require the support of loved ones to adhere to a live long practice of taking anti-retroviral drugs (ARD). It is also crucial for the partner to support his wife especially with infant feeding option. However, 37(7.4%) of the clients said they did not inform their partners of their HIV status. They gave various reasons for not informing them. Such as, 12 (31.6%) said they are afraid of his reaction, 4(10.5%) said they are afraid of being divorce. Another 13(34.2%) said they feel that since they are positive their partners are also positive. This may be wrong owing to results showing that 16-20% are discordant. Therefore, there is need to encourage women to inform their partners of their HIV status, and encourage them to test. A study by Awungafac, et al., (2015) reported a 16.8% male participation. However, Takah, et al., (2018) pointed out that low level of involvement of male partners must have played a big role in hindering uptake of services by HIV positive mothers leading to their study in the Sub-Saharan Africa. Their finding is very much in line with the current study where they identified a statistically significant increase in the uptake of infant antiretroviral prophylaxis with male partner

involvement. The male partners ensured an enhanced psychosocial intervention and verbal encouragement for their wives and the mothers showing the supremacy of integrating psychosocial components in male partner involvement intervention.

Thomson, et. al., (2018) reported that male partners had significant influence on women's participation in PMTCT. So, they related the barriers for women to remain active in Prevention of Mother to Child Transmission included being in a sero-discordant relationship or having a male partner who did not know their own HIV status, lack of male support for female engagement in Prevention of Mother to Child Transmission services. The uptake of Prevention of Mother to Child Transmission services therefore, can be facilitated among other factors by positive disclosure experience, especially with a male partner who knows own status and active support.

4.7. Administration of Nevirapine Prophylaxis to Children

In this study 477(95.8%) said their newborn children were given Nevirapine within 72hrs in accordance with the national guideline, while 21(4.2%) said theirs were not given (Table 5). More than half (57.1%) of those who said no said it was because they delivered at home and did not bother to take their children to the hospital. This clearly shows that despite the intervention, some women still don't take advantage to prevent the infection at this critical period of time. Another 2(9.5%) claimed that the drug was not available at the time they delivered. 5(23.8%) claimed that they are not aware that the child needed the drug. 2(9.5%) said they don't even know if the child was given or not. In prevention of mother to child transmission of HIV, the administration of Nevirapine Prophylaxis to children is very important. This is done to prevent HIV infection in all HIV exposed children. Nevirapine administration is done within 72hrs of delivery. During ANC HIV positive women are counseled to ensure that their new born babies are given Nevirapine within 72hrs of delivery.

4.8. Child Initiation on Cotrimoxazole and Reasons by women for HIV Test

This survey sought to find out if the exposed children were given Cotrimoxazole in line with the national guidelines (Table 6). Overwhelming majority(483/498, 97%) said their children were given Cotrimoxazole while only 15(3.0%) said no. Considering the immature immune system of the newborn it is imperative that all HIV exposed children be placed on Cotrimoxazole prophylaxis to prevent infection with Pneumonia which is a common opportunistic. Some of the respondents opined that they were encouraged by a positive mother who had a negative baby. The place of mentor mothers cannot be overemphasized. Greater majority (335/498, 7.3%] opined that the health education given by the health care providers motivated them to test. This finding agrees with a study conducted by Tesfaya et al, (2014) who studied pregnant women attending antenatal care in Ambo hospital in west Ethiopia, they identified the importance of creating awareness and enhancing Prevention of Mother to Child Transmission practice. They discovered that the level of awareness, knowledge and acceptance all played a good role in shaping their attitude towards the program. The social media were also found to play a role in motivating some women to agree to test. About 27(5.4%) said information from the social media made them to test while 39(7.8%) opined that the fear of infecting their child motivated them to test. All these reasons signaled to the fact that if women are fully motivated they will be willing to do the needful to prevent their children from becoming infected with HIV.

4.9. Service Satisfaction

Majority of the respondents (475/498, 95.4%) opined that they were satisfied with the PMTCT services (Table 7). However, 23(4.6%) of the women said they were not satisfied with the services provided. Some (3/23, 13.0%) of these women opined that they were not satisfied because of the attitude of health workers. This agrees with the findings of Naburi (2017) where on satisfaction of PMPTCT, a slightly lower proportion of patients who gave a poor rating was associated with dissatisfaction. Some 12(52.2%) attributed their dissatisfaction to non-availability of ART for their babies. 4(17.4%) claimed the DNA test results of infants was not given on time made them not to be satisfied. Others still said lack of transportation to come for follow up.

5. Conclusion

In identifying the prevention of Mother to Child Transmission Intervention Program in the State, the findings revealed that most of the respondents indicated that the facilities they attended offered HIV testing, Counseling and the Administration of ART. Most of them also agreed that pregnancy was an indication for HIV testing. The national guideline was in used which offered an opt-out approach to testing. From the findings most HIV testing was done in the ANC clinic, at the laboratory, in the maternity or anywhere the women found themselves. The HIV testing services was integrated at all points of care to give the women an opportunity to know their status. The findings showed that HIV intervention programs are available in the selected facilities although not all of them offered comprehensive program. In assessing the services rendered the results revealed health workers counseled women to wait and collect their results the same day. This finding shows that the clients at facilities were fully informed about the services and have agreed to use the opportunity to prevent the transmission of HIV to their infants. The findings also revealed that DNA/PCR test was done and majority of client got their results within 28days. Results at 6wks of birth and after 6weeks of complete cessation of breast feeding: The findings showed that 2.4% of HIV exposed children became infected which means they were infected in uterus. Further interview with the mothers showed that five of them started ANC very late at 30 weeks of gestation while seven of them had prolonged labour. The indigenous partner/state government has done well in supporting these facilities and need to extend such services to cover the whole state. The findings showed that most clients were given ARV

the same day they tested positive while a good number were already on treatment before ANC. Majority of clients said their infants were given nevirapine prophylaxis within 72hours of delivery. This finding indicated that women at the study facilities were given their ARVs as expected and their infants were also given the prophylaxis treatment which contributed to the low transmission rate during the period under study. Overall, HIV testing and counseling has remained the gateway through which women can access prevention of Mother to Child transmission of HIV services. The use of ARVs has remained the single and most important intervention in the prevention of Mother to Child Transmission of HIV.

6. Recommendations

In view of the findings of this study the authors wish to recommend that the PMTCT programme should be scaled up so as to achieve wider coverage of Health facilities and their catchment communities in Gombe State. Again, state-wide sensitization and awareness creation should be intensified for women to avail themselves of the available PMTCT services (start ANC on time- within 16 weeks of pregnancy) so as to know their HIV status before starting pregnancy and those found positive should have planned pregnancy. To reduce the chances of HIV transmission during breast feeding, positioning and attachment of the baby to the breast for adequate nutrition should be emphasized so as to prevent mixed feeding, cracked nipple which could lead to infection transmission. DNA/PCR test results should also be made available within 28days and given to all clients.

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8. Conflict Of Interest

The authors wish to state that there is no conflict of interest related to this study.

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