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EFFECT OF INFORMATION, EDUCATION AND COMMUNICATION (IEC) ON INFANT FEEDING PATTERNS OF HIV-POSITIVE NURSING MOTHERS IN RURAL COMMUNITIES OF ANAMBRA STATE, NIGERIA.

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ABSTRACT

Background: Infant feeding in the context of HIV has been a public health problem, especially in resource poor settings. Despite the ongoing fight against HIV/AIDS at the global, national and local levels, the impact of HIV/AIDS is usually pronounced among certain individuals, many of whom are the women living in the rural areas. This study was done to determine the effect of IEC on the infant feeding patterns of HIV- positive nursing mothers in rural communities of Anambra State, Nigeria.

Methods: A quasi-experimental study was conducted among 310 HIV-positive nursing mothers from the rural communities in Anambra State, Nigeria using pre-tested, semi-structured interviewer administered questionnaires to obtain information from the respondents. The respondents were selected using two- stage sampling technique and were followed up for 3 months. Data were analyzed using SPSS version 22, and associations between dependent and independent variables were tested using Fisher's exact test, Chi-square test and T-test as appropriate. Level of statistical significance was set at $\leq 5\%$.

Results: At baseline, exclusive breast feeding in the first 6 months was preferred and practiced by 69.4% and 68.7% of the respondents in the intervention and control groups respectively, followed by mixed feeding (22.5% and 16.7% respectively). There was no difference in the preferred infant feeding options of the respondents in both groups. ($p = 0.987$). At the end of 3 months, majority of the respondents in both groups (72.0% and 73.9% respectively) still preferred and practiced

exclusive breastfeeding, followed by mixed feeding (20.7% and 13.4% respectively), with no significant difference achieved (p = 0.103).

Conclusion: This study has shown that IEC had no effect on the infant feeding patterns of the HIV-positive mothers in rural communities of Anambra State, Nigeria. Despite the fact that majority of the respondents preferred and practiced exclusive breastfeeding in the first 6 months post delivery, some respondents preferred and practiced mixed feeding in the first 6 months post delivery; which is a threat to the infants' HIV free survival in Anambra State . There is a need for regular HIV and infant feeding counseling and education, targeted at HIV positive mothers in the rural settings of Anambra State.

KEY WORDS: Information Education and Communication, infant feeding, HIV-positive nursing mothers, rural communities, Anambra State.

INTRODUCTION

Infant feeding is among the key determinants of child survival and development.(Adhikari et al., 2021) Good nutrition, especially during the first years of life, is crucial for the health and well-being of children, and contributes to optimal growth and development.(Adhikari et al., 2021) Promotion of appropriate infant feeding practices is therefore an effective strategy for improving child survival.

Despite the ongoing global fight against Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), the impact of the disease still remains pronounced among certain individuals, many of whom are women living in the rural areas, especially in sub-Saharan Africa (SSA).(Bandal, 2014) These women often lack the knowledge about HIV/AIDS and are poor, uneducated, marginalized and disempowered and also face the challenges of limited access to accurate information on HIV and health care services.(Bandal, 2014)

MTCT of HIV accounts for over 90% of new HIV infections among children less than 15 years of age, and this can occur during pregnancy, labor, delivery and breastfeeding.(WHO, 2010) Nigeria has the highest burden of MTCT of HIV in the world currently which accounts for 30% of the global burden of MTCT of HIV; the proportion of health facilities in the country offering PMTCT service being low (with coverage of about 30%) and access being skewed in favor of the urban areas. (NACA, 2015; Okusanya et al., 2022). In 2020, about 130,000 children less than 15 years

of age were living with HIV in Nigeria according to the United Nations Children Fund (UNICEF) data.(UNICEF, 2021)

In spite of the fact that breast milk remains the most appropriate infant feeding method for child growth and survival, breastfeeding is a major route for MTCT of HIV.(Akpan, 2023) Due to the risk of transmission of HIV through breastfeeding, infant feeding in HIV context, has been a complex issue with a lot of concerns about how HIV-exposed babies should be fed.(FMOH, 2020) Apart from the malnutrition resulting from poor feeding practices, risk associated with infant feeding is a major complication of HIV/AIDS infection.(FMOH, 2020) In resource limited settings where the risk of infant death due to malnutrition and diarrheal diseases is high, severe acute malnutrition (SAM) remains a major problem for HIV-infected children.(FMOH,2020)

Because IEC aims at changing or reinforcing health related behaviors in a target audience, IEC on appropriate infant feeding in the context of HIV will motivate the HIV-positive nursing mothers in rural communities to adopt good infant feeding behaviors by providing them with knowledge through appropriate information. Interestingly, the period from pregnancy to two years is a very good opportunity for nutritional interventions.(Nkiema et al., 2017)

In Nigeria, the current recommendation for early infant feeding practices among HIV-positive mothers is exclusive breastfeeding (EBF) for the first six months, while both mother and infant receive ARV therapy or prophylaxis as appropriate; adequate complementary food should be introduced thereafter, with breast feeding continued until the infant is one year old.(FMOH, 2020) Where EBF is not feasible, HIV-positive mothers are well supported to exclusively formula feed in the first six months.(FMOH, 2020)

Replacement feeding (RF) with infant formula eliminates postnatal transmission of HIV. Nevertheless, it is associated with high rates of infant morbidity and mortality from causes other than HIV, particularly malnutrition and other illnesses such as diarrhea and pneumonia, which are among the major causes of under-five mortality in resource poor settings.(FMOH, 2020) However, mixed feeding (MF) is not recommended because of the consequences on child health and survival. It carries a greater risk of HIV transmission and diminishes the chances of survival especially in the first six months of life.

Despite the availability of evidence-based recommendations and guidelines on infant feeding in the context of HIV, misconceptions and confusion about safer feeding practices still persist,

especially in the resource-poor countries.(Kohan et al.,2016) Due to the poor infant feeding knowledge resulting from poor infant feeding counseling and education; and other infant feeding challenges faced by the mothers, some HIV- positive mothers often resort to practices which fall outside the infant-feeding recommendations, thereby compromising their infants' HIV-free survival.(Onubogu et al.,2015; Samburu, 2020)

Several studies have been carried out on HIV and infant feeding options in Anambra State, Nigeria, but they were mainly facility based and non-interventional studies. The index research was designed to determine the Effect of IEC on the infant feeding patterns of the HIV-positive mothers in rural communities of Anambra State, Nigeria.

METHODOLOGY

The study was a quasi-experimental study carried out among HIV-positive nursing mothers from selected support groups of the PLHIV in the rural communities in Anambra State, south- eastern Nigeria, between May and August, 2019. With the annual population growth rate of 2.84% per annum,(Anambra Population, 2019) the estimated population of Anambra State as at 2020 was 5,838,932 persons. Included in the study were all the HIV-positive nursing mothers within the reproductive age group (15-49 years); with children aged 0-12 months, who are members of support groups. Excluded in the study were those HIV-positive nursing mothers who met the inclusion criteria but refused to give their consent for the study.

The minimum sample size to determine a difference in exclusive breast feeding rate of mothers pre and post-intervention, with 80% power and 95% confidence interval was calculated using the sample size formula for experimental studies (Hanga et al., 2014), with exclusive breastfeeding rate (14%) being the pre-intervention exclusive breastfeeding rate among HIV positive mothers in a previous study (Ijumba,2014), the anticipated increase in exclusive breastfeeding rate among HIV positive mothers post-intervention being 28%; and 10% over estimation was done to accommodate for non-response. A minimum sample size of 148 for each subgroup (intervention and control groups) was obtained.

Two-stage sampling technique was used to select 310 respondents from both groups (160 from the intervention group and 150 from the control group). There are 21 support groups for the People Living with HIV/AIDS (PLHIV) located in 12 rural LGAs, and spread across the 3 senatorial zones, with a total of 794 nursing mothers who met the inclusion criteria for the study. The

distribution of the mothers in the LGAs in the senatorial zones were as follows: Anambra North (AN) senatorial zone – 4 LGAs, Anambra Central (AC) senatorial zone – 5 LGAs, and Anambra South (AS) senatorial zone – 3 LGAs.

There were 5 support groups in AN, 11 in AC, and 5 in AS senatorial zones.

The stages were as follows:

Stage 1: Selection of local government areas: Using simple random sampling, 2 LGAs were selected from each of the senatorial zones.

Stage 2: Selection of subjects from support groups of PLHIV in the selected LGAs: All the support groups of PLHIV in each selected LGA were used. The distribution of the mothers who met the inclusion criteria is as follows:

AN - 184, AC - 431, and AS – 179. (Ratio = 1: 2 : 1 approximately)

Using proportionate allocation, the number of subjects selected per senatorial zone for intervention and control groups was as follows:

AN : 1/4 x150 = 38 subjects approx. (i.e. 19 subjects in LGA_1 and 19 subjects in LGA_2).

AC: 2/4 x150 = 75 subjects (i.e. 38 subjects in LGA_1 and 37 subjects in LGA_2).

AS : 1/4 x 150 = 38 subjects approx.(i.e. 19 subjects in LGA_1 and 19 subjects in LGA_2).

Using the list of mothers from support groups of PLHIV who met the inclusion criteria in the LGAs, as a sampling frame, simple random sampling was used to select mothers into intervention and control groups until the required sample size was met.

The quantitative data was collected using pretested semi-structured interviewer administered questionnaire adapted from the 'Questions to assess infant feeding practices in the context of mother-to-child transmission of HIV' and from similar studies.(Eneji et al., 2017; Igbokwe et al., 2016; WHO, 2018).

Before the intervention, baseline data was collected from the participants in the intervention and control groups, using the same questionnaires.Health education on infant feeding was given to the participants in the intervention group only. Immediately after the intervention, data was collected (post-test) from the respondents in the intervention group only, and then three months after from the respondents in both groups, using the same questionnaire to assess the same parameters. The baseline and post test data collection lasted for a period of one week each.

Data were analyzed using SPSS version 22 and associations between dependent and independent variables were tested using Fisher's exact test, Chi-square test and T-test as appropriate. P value ≤ 0.05 was considered to be statistically significant. Ethical approval was obtained from Nnamdi Azikiwe University Teaching Hospital Ethics Committee (NAUTHEC).Written permission to conduct the study was obtained from the general coordinator of the Association of Women Living With HIV and AIDS in Nigeria (ASWHAN), Anambra State chapter. Participation was entirely voluntary.

RESULTS

At baseline, a total of 310 HIV-positive nursing mothers (160 from the intervention group and 150 for the control group) with babies between the ages of 0-12 months were recruited and followed up for a period of 3 months, after administering a health intervention on infant feeding only to the participants in the intervention group.

At the end of 3 months follow- up period, 10(6.25%) participants were lost to follow-up leaving 150 participants in the intervention group while 8(5.33%) participants were lost to follow-up in the control group leaving 142 participants at the end of 3 months follow- up period.

Majority of the respondents in both sub-groups were in the 25-34 years category, and their mean age was 32.4±5.1 years. The age categories of the babies in both sub-groups were similar, and their mean age was 5.1±3.4 years. Greater proportions of the respondents in both sub-groups (43.1% and 50% respectively) were earning < 10,000 naira per month, while 46.3% and 28.7% respectively of the respondents had at least 4 children. Secondary education was attained by majority of respondents in both sub-groups. While majority of them were petty traders, their spouses were mainly artisans.

At baseline, exclusive breast feeding in the first 6 months was preferred and practiced by 69.4% and 68.7% of the respondents in the intervention and control groups respectively, followed by mixed feeding (22.5% and 16.7% respectively). There was no difference in the preferred infant feeding options of the respondents in both groups. (p = 0.987). At the end of 3 months, majority of the respondents in both groups (72.0% and 73.9% respectively) preferred and practiced exclusive breastfeeding, followed by mixed feeding (20.7% and 13.4% respectively), with no significant difference achieved (p = 0.103).

Table 1: Socio-demographic characteristics of the respondents

	Intervention (n=160) n(%)	**Control (n=150) n(%)**	**Total (n=310) n(%)**	**Test statistic**	**P –value**
Age category(years)					
15-24	6(3.8)	8(5.3)	14(4.5)	FE=10.936	0.008*
25-34	83(53.1)	98(64.0)	181(58.4)		
35-44	69(43.1)	42(28.0)	111(35.8)		
≥ 45	0(0.0)	4(2.7)	4(1.3)		
Mean age ± SD	33.1± 4.7	31.8±5.5	32.4±5.1	t=2.296	0.023*
Marital status					
Single	1(0.6)	0 (0.0)	1(0.3)	FE=5.016	0.266
Married	142(88.8)	122(81.3)	264(85.2)		
Divorced	1(0.6)	3(2.0)	4(1.3)		
Separated	5(3.1)	8(5.3)	13(4.2)		
Widowed	11(6.9)	17(11.3)	28(9.0)		
Parity					
One	18(11.3)	37(24.7)	55(17.7)	χ^2 =14.544	0.002*
Two	42(26.3)	42(28.0)	84(27.1)		
Three	26(16.3)	28(18.7)	54(17.4)		
Four and above	74(46.3)	43(28.7)	117(37.7)		
Tribe					
Ibo	158(98.8)	144(96.0)	302(97.4)		
Hausa	0(0.0)	0(0.0)	0(0.0)	FE=2.39	0.162
Yoruba	0(0.0)	0(0.0)	0(0.0)		
*[1]Others	2(1.3)	6(4.0)	8(2.6)		
Religion					
Christianity	160(100)	150(100)	310(100)	-	-
Islam	0(0.0)	0(0.0)	0(0.0)	0(0.0)	
Traditional religion	0(0.0)	0(0.0)	0(0.0)	0(0.0)	
*[2]Others	0(0.0)	0(0.0)	0(0.0)	0(0.0)	

Table 1 contd: Socio-demographic characteristics of the respondents

	Intervention (n=160) n(%)	**Control (n=150) n(%)**	**Total (n=310) n(%)**	**Test statistic**	**P –value**
Educational status					
No formal education	0(0.0)	4(2.7)	4(1.3)	FE =8.287	0.310
Primary	16(10.0)	18(12.0)	34(11.0)		
Secondary	115(71.9)	89(59.3)	204(65.8)		
Tertiary	29(18.1)	39(26.0)	68(21.9)		
Monthly income					
< 10,000	69(43.1)	76(50.7)	145(46.8)	χ^2 =22.671	0.000*
10,000-19,000	53(33.1)	66(44.0)	119(38.4)		
20,000-29,000	16(10.0)	6(4.0)	22(7.1)		
≥ 30,000	22(13.8)	2(1.3)	24(7.7)		
Age of babies (months)					
< 6	80(50.0)	80(53.3)	160(51.6)	χ^2 =0.344	0.571
≥ 6	80(50.0)	70(46.7)	150(48.4)		
Mean age ± SD	5.0±3.5	5.2±3.4	5.1±3.4	t = -0.379	0.705

***Statistically significant (P ≤ 0.05), FE = Fisher's exact test**

***[1]Others = Ibibio, Tiv.**

***[2]Others = Buddhism, Hinduism.**

***[3]Others=Pastors, native doctors.**

Table 2: The baseline preferred infant feeding options of the respondents in the intervention and control groups in the first 6 months post delivery.

Variable	Intervention (n =160) n(%)	Control (n=150) n(%)	Total (n=310) n(%)	Test Statistic	P- value
Feeding option 6 months post delivery					
Exclusive breast feeding	111(69.4)	103(68.7)	24(69.0)		
Exclusive formula feeding	13(8.1)	22(14.7)	35(11.3)	χ^2 = 4.279	0.124
Mixed feeding	36(22.5)	25(16.7)	61(19.7)		
*[1]Others	0(0.0)	0(0.0)	0(0.0)		

***[1]Others = 'Wet nursing', heat treated expressed breast milk, use of milk banks**

Table 2: The preferred infant feeding options in the first 6 months after delivery by the respondents in both subgroups 3 months post-intervention

Variable	Intervention (n =160) n(%)	Control (n=150) n(%)	Total (n=310) n(%)	Test Statistic	P- value
Feeding option 6 months post delivery					
Exclusive breast feeding	108(72.0)	105(73.9)	213(72.9)		
Exclusive formula feeding	11(7.3)	18(12.7)	29(9.9)	χ^2 = 4.396	0.103
Mixed feeding	31(20.7)	19(13.4)	50(17.1)		
*[1]Others	0(0.0)	0(0.0)	0(0.0)		

***[1]Others = 'Wet nursing', heat treated expressed breast milk, use of milk bank**

DISCUSSION

The findings of the index study showed that majority of the respondents in both sub-groups preferred and practiced exclusive breast feeding (EBF) in the first six months after delivery, followed by mixed feeding (MF),then exclusive formula feeding (EFF) at baseline. The proportion of the respondents that practiced EBF in the index study is however lower than what was reported in the study by Lawani et al.,(Lawani et al., 2014) but higher than what was reported in the study by Igbokwe et al. (Igbokwe et al., 2016) A likely explanation for this could be the differences in infant feeding knowledge of the respondents in the different studies, even though knowledge may not translate to actual practice. The practice of EBF by majority of the respondents was also found in other similar studies (Usman et al., 2015; Williams et al., 2016), though with varied proportions. Similar to the result findings, a low rate of EFF practice among respondents was found in a study that was done in Kenya.(Andare et al., 2019) The low EFF rate observed in the index study could be due to the fact that most of the respondents were of a low socio-economic status and may not be able to afford infant formula milk. The preference and practice of either formula or mixed feeding over EBF in the first six months had been reported in several similar studies.(David and Ezechi, 2016; Ikeako, et al., 2015; Kalu et al., 2014; Reynolds et al., 2014; Onubogu et al., 2015; Verma A, 2016) Breastfeeding exclusively for the first six months by majority of the respondents is a positive step towards achieving an HIV-free infant survival in the rural communities of the state. However, the practice of mixed feeding by some of the respondents implies that their babies were at risk of being infected with HIV through breastfeeding.(Lawani et al., 2014) Few of the babies that were exclusively formula-fed were at risk of malnutrition and other illnesses such as diarrhea and pneumonia.(Ogbo, 2016) Due to the several benefits of breastfeeding, both to the mothers and their babies, mothers irrespective of their HIV status, should be adequately supported to breastfeed, in line with the current recommendations on infant feeding.

Between group comparison of the preferred infant feeding practices of the respondents in both groups at the end of 3 months showed that majority of the respondents practiced exclusive breastfeeding, followed by mixed feeding, and then exclusive formular feeding; with no difference in the preferred infant feeding choices of the respondents in both groups at the end of 3 months. Contrary to the findings of the current study, a randomized control study on the effectiveness of the Baby-friendly Community Initiative in promoting exclusive breastfeeding among HIV-negative and positive mothers, showed that the HIV-positive mothers in the intervention group had higher exclusive breastfeeding rates at 6 months compared to the control group, even though the difference was not statistically significant.(Samburu et al, 2020) Several other studies also reported increase in exclusive breastfeeding rates following interventions.(Imdad and Yakoob, 2011; Jiang etal., 2014; Jolly et al., 2012; Nor B et al., 2012; Olorunfemi, 2018), contrary to the findings of the present study. The observed differences might be due to differences in the modes of intervention used in the different studies.

The practice of a safer feeding option by majority of the respondents will help to promote HIV-free survival among the HIV-exposed babies in the State. Nevertheless, with the proportion of the respondents that still practiced MF, some of the HIV-exposed babies in Anambra State are at risk of Mother to Child Transmission of HIV through breast feeding. Safe infant feeding practices remain an integral part of Prevention of Mother to Child Transmission of HIV and can lead to the promotion of good health and well being among the HIV-exposed babies in line with Sustainable Development Goal 3.

The effect of the intervention on the infant feeding choices of the respondents appeared not be obvious in this study due to the nature and design of the study, but the intervention helped the respondents who were using safer infant feeding options to maintain such to the recommended duration.The strength of this study lies in the fact that it was community based. The present study

is however limited in terms of duration of the follow-up period, as the 3 months follow-up period was not enough to show behavior change in infant feeding practices of the respondents in the intervention group. More research with a longer follow-up period, therefore needs to be conducted in this area in future.

In conclusion, despite the fact that majority of the respondents in both sub-groups preferred and practiced exclusive breast feeding in the first 6 months after delivery, significant proportions of the respondents in both groups, practiced mixed feeding, which is a threat to the Prevention of Mother to Child Transmission of HIV programs in the State and the country at large. Therefore , there is need for continued HIV and infant feeding counseling of the HIV-positive nursing mothers in Anambra State by the peer counselors and peer educators.

REFERENCES

Adhikari, N., Acharya, K., Upadhya, D.P., Pathak, S., Pokharel, S., Singh, P.M., et al. (2021). Infant and young child feeding practices and its associated factors among mothers of under two years children in a Western Hilly Region of Nepal. PLoS ONE, 16(12), 1-14.

Akpan, U., Omoronyia, E., Arogundade, K. , Asibong, U., Nwagbata, A., Akpanika, C., et al. (2023). Infant Feeding Practices Among Women Living With HIV in a Southern Nigerian Region: A Mixed Comparative Study. Cureus, 15(2), e35483. DOI 10.7759/cureus.35483.

Anambra Population. Available from:population.city/nigeria/adm/anambra.[Accessed 24/1/19].

Andare, N., Ochola, S., Chege, P. (2019). Determinants of infant feeding practices among mothers living with HIV attending Prevention of Mother to Child Transmission Clinic at Kiambu Level 4 hospital, Kenya: a cross-sectional study. Nutrition Journal, 18, 1–8.

Bandali, S. (2014).Women Living with HIV in Rural Areas.Implementing a Response using the HIV and AIDS Risk Assessment and Reduction Model. Clinical Medicine Insights & Women's Health, 7, 25–35.

David, A.N., Ezechi, O.C., Aghahowa, E. (2016). Infant feeding practices of HIV positive

mothers in Lagos, South-western Nigeria. Malaysian Journal of Nutrition, *23*(2), 253–262.

Eneji, J.E., Eneji, C.V., Mgbekem, M.A., Ngoka, V.N. (2017). Health system factors as correlates of infant feeding options among HIV-positive mothers in Ogoja Local Government Area of Cross-River State,Nigeria. International Journal of Nursing,Midwife, and Health-Related Cases, *3*(4), 35–45.

Federal Ministry of Health.(2020).National Guideline for HIV prevention, Treatment and Care. National AIDS and STI's Control Program, Federal Ministry of Health, Abuja, Nigeria.

Hanga, A.H., Johargy, A., Mahmood, K., Humma, H. (2014).Design and determination of thesample size in medical research. IOSR-Journal of Dental and Medical Sciences,13(5),21–31.

Igbokwe, L.N., Aniwada, E.C., Uleanya, N. D., & Adinma, E.D. (2016). Factors that Influence Infant Feeding Options of HIV-Positive Mothers in Urban and Rural Communities in South-East , Nigeria. British Journal of Medicine & Medical Research, 15(7), 1–10.

Igbokwe, L.N., Aniwada, E.C., Uleanya, N.D., Uzochukwu, B.C. (2016). Comparison of the Knowledge and Practice of current infant feeding options among HIV-positive mothers in Urban and Rural communities in Anambra State,Nigeria. International Journal of Tropical Medicine and Public Health, 6(2), 6–12.

Ijumba, P.(2014).Intervention for improved newborn feeding and survival where HIV is common.Perceptions and effects of a community-based package for maternal and newborn care in a South African township phD[dissertation].Uppsala University.Available from: https://www.divaportal.org/smash/get/diva2:746533/FULLTEXT01.pdf.[Accessed April 7, 2018].

Ikeako, L.C., Ezegwui, H.U., Nwafor, M.I., Okeke, T.C. (2015). Infant Feeding Practices amongHIV-Positive Women in Enugu , Nigeria. British Journal of Medicine & Medical Research, 8(1), 61–68.

Imdad, A., Yakoob, M.Y., Bhutta, Z.A. (2011). Effect of breastfeeding promotion interventionson breastfeeding rates, with special focus on developing countries.BMC Public Health, 11, 1–8.

Jiang, H., Li, M., Wen, L.M., Hu, Q., Yang, D., He, G., et al.(2014).Effect of Short Message Service on Infant Feeding Practice :Findings From a Community-Based Study in Shanghai,

China. Journal of American Medical Association Paediatrics, 168(5), 471–478.

Jolly, K., Inqram L., Freemantle, N., Khan, K., Chambers, J., Hamburger, R. (2012).Effect of a peer support service on breast-feeding continuation in the UK: a randomised controlled trial.Midwifery, 28(6), 740–745.

Kalu, S.O., Reynolds, F., Petra, G.B., Ikechebelu, J.I., Dada, M.O., Oluboyo, B.O., et al.(2014). Infant Feeding Choices Practiced among HIV Positive Mothers Attending a Prevention of Mother to Child Transmission (PMTCT) of HIV Program in Nnewi, Nigeria.Journal of AIDS & Clinical Research, 5, 2-6.

Kohan, S., Heidari, Z., Keshvari, M. (2016). Facilitators for Empowering Women in Breastfeeding : a Qualitative Study. International Journal of Paediatrics, 4(25), 1287–1296.

Lawani, L.O., Onyebuchi, A.K., Iyoke, C.A., Onoh, R.C., Nkwo, P.O. (2014). The challenges of adherence to infant feeding choices in Prevention of Mother-to-Child Transmission of HIV infections in South East Nigeria.Dove Medical Press, 8, 377–381.

National AIDS Control Agency. (2015). Nigeria Global AIDS Response Country Progress Report.Available from:https://www.medbox.org/…hiv/global-aids-response-country-progress-report-nigeria.[Accessed April 18, 2017].

Nkiema, L., Huybreqts, L., Martin-Prevel, Y., Donnen, P., Lanou, H., Grosemans, J. (2017). Effectiveness of facility-based personalized maternal nutrition counseling in improving child growth and morbidity up to 18 months: A cluster-randomized controlled trial in rural Burkina Faso. PLoS ONE, 12(5), 2–26.

Nor, B., Ahlberg, B.M., Doherty, T., Zembe,Y., Jackson, D., Ekstrom, E.C.(2012). Mother's perceptions and experiences of infant feeding within a community-based peer counselling intervention in South Africa. Maternal & Child Nutrition, 8(4), 448–458.

Ogbo, F. A. (2016). Is the Fear of Mother-to-Child Transmission of HIV A Key Determinant of Non-Exclusive Breastfeeding in Nigeria?Austin Journal of HIV/AIDS Research., 3(3), 3–5.

Okusanya, B., Nweke, C., Gerald, L.B.,Pettygrove, S., Taren, D., Ehiri, J.(2022). Are Prevention of Mother-to-Child HIV transmission service providers acquainted with National guideline recommendations? A cross-sectional study of Primary Health Care centres in Lagos, Nigeria. BMC Health Services Research, 22, 769. https://doi.org/10.1186/s12913-022-08152-6.

Olorunfemi, S.O., Dudely, L.(2018).Knowledge, Attitude and Practice of infant feeding in the

first 6 months among HIV-positive mothers at the Queen Mamohato Memorial hospital clinics, Maseru, Lesotho. African Journal of Primary Health Care & Family Medicine, 10, 1–12.

Onubogu, C.U., Ugochukwu, E.F., Egbonu, I. (2015). Adherence to infant-feeding choices by HIV-infected mothers at a Nigerian tertiary hospital : the pre- " rapid advice " experience.South African Journal & Clinical Nutrition, 28(4), 180–186.

Samburu, B.M., Young, S.L., Wekesah, F.M., Wanjohi, M.N., Kimiywe, J., Muriuki, P., et al. (2020). Effectiveness of the baby-friendly community initiative in promoting exclusive breastfeeding among HIV negative and positive mothers: a randomized controlled trial in Koibatek Sub-County, Baringo, Kenya. International Breastfeeding Journal, 15, 1-13.

United Nations Children Fund. (2021). Nigeria HIV/AIDS data. Available from:https://www.unicef.org>nigeria.[Accessed April 14, 2024].

Usman, A., Fawole, O., Dairo, D., Saheed , G. (2015). Factors influencing Infant feeding choices of HIV positive mothers in South-West,Nigeria. American Journal of Public Health Research, 3(5), 72–79.

Verma, A., Dixit, P. (2016). Knowledge and Practices of Exclusive breastfeeding among women in Rural Uttar Pradesh. Journal of Neonatal Biology, 5(3),2–7.

Williams, A.M., Chantry C.,Geubbels, E.L., Ramaiya, A.K., Shemdoe, A.I., Tancredi, D.J., et al. (2016). Breastfeeding and Complementary Feeding Practices among HIV-Exposed Infants in Coastal Tanzania. Journal of Human Lactation, 32(1), 112–122.

WHO,UNAIDS,UNFPA,UNICEF.Guidelines on HIV and Infant feeding. Principles and recommendations for Infant feeding in the context of HIV and a summary of evidence. Geneva.2010.Available from: https://www.unicef.org/nutrition/files/HIV_ and _IF _ guidelines _ and _summary _of _evidence_ 2010.pdf.[Accessed April 15, 2019].