

**HEALTH SYSTEM FACTORS AS CORRELATES OF INFANT FEEDING
OPTIONS AMONG HIV POSITIVE MOTHERS IN OGOJA LOCAL
GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA**

¹Eneji, J. E. O., ²Eneji, C. V. O., ³Mgbekem, M. A. & ⁴Ngoka, V. N

¹School of Midwifery, Moore Road, Calabar

²Dept. of Environmental Education, University of Calabar, Nigeria

³Dept. of Nursing Sciences, University of Calabar, Nigeria

⁴University of Nigeria Teaching Hospital, Ituku Ozala, Enugu, Nigeria

ABSTRACT: *Most rural communities are faced with numerous health challenges including contagious and terminal diseases. Their extent of survival from most of these ailments is tied to the quality of health facilities, equipments and the service providers available within the rural setting and the extent of affordability of these services. The problem is most aggravated when the issue involve is a communicable disease with terminal possibilities like HIV and the quality and accessibility of health facilities available to these rural dwellers. Most HIV+ mothers are faced with the risk of transmitting the virus to their new infant especially during infant birth and breastfeeding. The incidence of mother to child transmission of HIV can be reduced if there are functional health systems that can give the basic information and also provide the necessary services to reduce the incidence of mother to child transmission of HIV. Most HIV+ mothers are faced with the challenges of feeding their infant children; hence the health system factor was examined to ascertain the extent to which this influence the choices of infant feeding options among HIV+ mothers. The study adopted the descriptive research design, 136 HIV+ mothers were purposefully sampled for the study. The instruments for data collection were structured questionnaire and semi structured interview. Chi square was used for data analysis and the result of the analysis revealed that availability of qualified personnel providing basic services, (14.194, $P \leq 0.05$), adequacy of ARVs for pregnant HIV+ mothers, (12.709, $P \leq 0.05$), the availability of medical equipments for attending to HIV+ mothers, (14.367, $P \leq 0.05$), giving of basic education on various feeding options to HIV+ mothers, (13.576, $P \leq 0.05$) statistically significant. The study concluded that health system influences the choices of infant feeding options among HIV+ mothers. It was therefore recommended that government, organizations or individuals who can afford to provide health facilities should also endeavor to put the necessary facilities, equipment and qualified personnel in such facilities to give adequate services and education to those who may wish to access their services.*

KEYWORDS: Health system factors, infant feeding options, HIV+ mothers and mother to child transmission

INTRODUCTION

Most rural communities suffer from the near absence of functional health systems, health system encompasses not only the availability of health facilities, but it takes into consideration the availability of the physical structures, the nurses, doctors and other health care service providers available, the quality and their professional competences, the availability of other facilities and equipments and diagnostic devices, their functionality, the

availability of drugs at subsidized rates to the people, the quality of information available to the people and the functional status and the relationship between the service providers and the client that visit such health facilities.

Most rural communities are faced by numerous health challenges including the contagious and terminal diseases, their extent of survival from most of these ailments are tied to the quality of health facilities and the services providers available within the rural setting and the extent of affordability of these services. The problem is further aggravated when the issue involve is a communicable disease with terminal possibilities like HIV, tuberculosis, hepatitis, ebola etc., the fear of stigmatization and rejection coupled with fear and anxiety are all further complexities suffered by people suffering from these health challenges in Nigeria and world over.

The situation becomes worrisome having heard that HIV for example is communicable through breast feeding, body fluid, piercing and sex. Most people suffering from HIV suffer a lot of humiliations due to rejection by spouse, friends, siblings, and community and family members. Even HIV positive partners find it very difficult to inform or disclose their HIV status their partner for fear of all these complexities. This is the case with HIV positive mothers in most community setting. When HIV positive people become pregnant, the fear of feeding their infant and themselves, the fear of post partum and delivery and the fear of transmitting the HIV virus from mother to child, it is during this dilemma that the health system is supposed to come in and correct the anomaly faced by these HIV positive mothers. Most HIV+ mothers are encouraged to make choices of their infant feeding practices from the health information available to them during their antenatal visits to these health facilities. These available health services include the quality of the health care service providers available to the HIV+ mothers, their professional competence, the availability of equipments for and diagnostic purposes, the antiretroviral therapies (ARVs) drugs and palliative care, the counseling services available and the ability to properly counsel the HIV+ positive client amongst others.

Studies have shown that there is a link between health systems and the choices of infant feeding options including the provision of basic health care services to nursing mothers in general and those of HIV positive mothers in particular (De Paoli, Manongi and Klepp, 2004; Buskens, 2004; Buskens, 2005; Leshabari, Blystad, De-Paoli & Moland, 2007; Laar & Laar, 2012). The type of health system any country has constitutes a great deal to the quality of services rendered to its citizens including counseling and accessing ARV drugs and other services. Magavero, Norton & Saag, (2011) observed that the choices of infant feeding options made by any nursing mother is a product of the quality of health information system and services available to such a mother, irrespective of the HIV status of such mothers. The authors went further to state that most HIV positive mothers are beneficiaries of the information available on the choices of infant feeding option so they take any available option not minding their health status, the affordability, accessibility and sustainability of such options.

Many health care providers advised mothers based on 2003 guidelines that called for exclusive formula feeding for HIV-positive women; these providers were either unaware of or uncomfortable with 2010 guidelines on informed choice between exclusive breastfeeding or avoiding all breastfeeding. This suggests that pre- and in-service training is needed in counseling mothers on safe feeding of infants less than 6 months old in general. Hoat, Huong and Xuan., (2010) were not different in their positions when they observed that most health

systems lack the qualified personnel to carry out the basic services which are to be rendered to the client on visitation to the health facilities, some may give a disjointed information or misleading information to mothers which may drastically affect the choices most HIV positive mothers make ranging from disclosure of their HIV positive status, accessing antiretroviral therapies, joining of support groups, attaining PMTCT clinical sessions and above all the choices of infant feeding options which such HIV positive mothers make (WHO, 2006; WHO, 2011; Young, *et al.*, 2011). Judging from the position of Hoat *et al.*, (2010), Horstmann, Brown, Islam, Buck and Agins., (2010) noted that the availability of health systems alone cannot guarantee the quality of required services rendered there, but the quality of the staff and availability of resources within such health services and the ability of these staff to know how to use such facilities will go a long way to give the required services and information to both HIV positive mothers and other client coming to such health systems for medical or clinical services, and concluded that health system is a very serious contributory factor in determining the quality of health care services any country provides for her citizens (Varga, *et al.*, 2006; Throne, *et al.*, 2009; WHO, 2011).

Sadoh, *et al* (2008) carried out a study on infant feeding practices among HIV-infected mothers in a HIV-treated program. Using an empirical examination of the determinants of the size of the health workforce and overall health expenditures across fifteen Organization of Economic Community of Developing Countries (OECD), analysis estimated and evaluated the effects of variables such as the proportion of female physicians and the elderly, expenditures on ambulatory care, enrollment levels in training programs, level of public financing, and per capita income on the size of the health workforce and level of health spending between 1970-1991. The findings of the study shows that the health system workforce despite the ever increasing staff strength is grossly inadequate and affects the provision of quality clinical services including counseling to HIV positive mothers on the choices of infant feeding options, (Swarts, *et al.*, 2010; Throne, *et al.*, 2011).

The findings further revealed that since the quality of health services provided in every health facility is a product of the health system, it is therefore necessary that government and other private partners should make adequate provision in the supplies, provision and stocking of the few available health care system to enable them provide quality services to HIV positive mothers, thereby encouraging these HIV positive mothers to make informed choices on their infant feeding options which is practicable, safe and affordable within the context of the mean earning of such HIV positive mothers. The study therefore concluded that the quality of health care system a country has makes or mars the quality of health care services provided, hence the quality of health care system also contribute to any understanding of what accounts for changes in the size of the health labor force and expenditures require disentangling the effects of variables which needs to be taken into account when considering health system reforms (Seidel, Sewpaul & Dano, 2010; Sethuraman, *et al.*, 2011; Suuk & Veloshnee, 2012).

Magavero, *et al.*, (2011) carried out a comparative study to assess health care system and policy factor influencing engagement of HIV medical care: piecing together the fragments of fractured health care delivery system. Using a systematic sampling with an Open-ended questionnaire used to collect data. Descriptive statistic was used to analyze data. The authors observed that real-time surveillance of all components of engagement in HIV care is critical to maximize the use of limited resources, guide the deployment of evidence-based interventions, and monitor and respond appropriately to emerging outbreaks, to optimize

individual- and population-level HIV health outcomes. Notably, the ability to track and respond effectively to true HIV infection incidence in real time is an important goal and, although extraordinarily difficult to implement, remains a top priority. Unfortunately, current health care systems have limited patient-level surveillance data regarding engagement in HIV care and very little capability to measure actual incident cases of HIV infection (Schneider, *et al.*, 2004; Sadoh, *et al.*, 2008; Seidel, Sewpaul & Dano, 2010). Estimates of the number of patients in HIV medical care are often based on dated surveillance data or extrapolated by merging utilization and claims data collected from public and private sources to provide relatively crude population estimates.

Rea, *et al.*, (2007) further observed that at the clinic level, delays from initial call to initial medical visit have been associated with HIV-infected patients' failure to engage in HIV care, lack of flexibility of clinic hours to accommodate work schedules and dependent care activities also serves as a barrier to consistent HIV care. Within the clinic, culturally appropriate services, coupled with a prevailing climate of acceptance of all individuals, are essential components for encouraging patients to seek and remain in care. Similarly, the importance of the patient-provider relationship has been linked to adherence to ART and to HIV care. The author highlighted the need for system-level implementation of education and training activities for health care providers and clinic staff who care for HIV-infected individuals (Minnie & Greeff, 2006; Ngare, *et al.*, 2007; Moses, *et al.*, 2009; Mohammed, *et al.*, 2010)

Branson, Handsfield & Lampe (2006) in their comparative study on revised recommendations for HIV testing of 25 adults, 15 adolescents and 60 pregnant women in some health-care settings. A cohort of HIV infected and uninfected women using questionnaire were concluded based on the evidence that although breast health problems (painful nipple, cracked nipple, bleeding nipple, engorgement, blocked milk duct, breast thrush, nipple oozing pus, breast oozing pus, and mastitis/abscess) are generally rare, data analyzed using Cronbach showed that, there was no difference in its occurrence among HIV infected and uninfected women. It is worthy of note that women with these breast health problems were more likely to pass on the virus to their breastfeeding infants. In situations like these, infant feeding options should therefore exclude breast feeding and express breast milk. It is however recommended that it is highly important that they receive prompt management of problems by breastfeeding counselors. Overall, considering the different outcomes investigated in this study, breastfeeding in HIV-positive mother do not increase risk of mortality or decrease CD4 counts or increase viral loads (RNA level) in HIV positive women. It is however observed that breastfeeding in these women may result in reduced weight loss (BMI) and dire social consequences like stigmatization and isolation in some communities resulting to a negative toll on the HIV positive mother. Finally, some HIV-positive women may perceive breastfeeding to increase progression of HIV because of underlying food insecurity issues (Minnie & Greeff, 2006; McNaghten, *et al.*, 2007; Maru & Haidar, 2009).

Magavero, Norton & Saag, (2011) presented evidence to the fact that to some extent, breastfeeding does not have an adverse effect on health of HIV-positive mothers. The WHO's revised recommendations (2009) on infant feeding and antiretroviral therapy in HIV-positive mothers should be used as guidelines in these settings to protect the health of both mother and child. Although great milestones have been achieved in the area of expert and patient education, there is still a need to continually equip health professionals and educators with

the most up to date information on the disease. At the same time, avenues should be created to bridge current gaps in knowledge. Mothers need information about the relative risks and benefits of breast-feeding, progression of HIV, early weaning, wet-nursing and formula feeding. Additionally, all choices available to women with regards to infant feeding should be discussed and guidance provided to help infected women make an informed choice (Leshabari, *et al.*, 2007; Leshabari & Sebalda, 2008; Laar & Govender, 2011; Laar & Laar, 2012). Granted that the health system is meant to attend to man's multifaceted problems, how far has the available health systems satisfactorily affected the lives of HIV positive mothers in their health care delivery and what role has the health system played in the choice of infant feeding options adopted by HIV positive mothers? It is based on this reasoning that this research is therefore designed to assess how health care as a factor influence the choice of infant feeding options among HIV positive mothers in Ogoja local government area of cross river state, Nigeria.

METHODOLOGY

Descriptive research design was adopted as the research design for this study. The study was carried out at the General Hospital Ogoja and Roman Catholic Mission (RCM) Maternity Hospital (Moniaya) is situated in Ogoja Local Government Area of Cross River State, Nigeria. Ogoja is bounded in the north by Bekwarra Local Government Area of Cross River State, in the west, by Mbube, bounded by Yala Local Government of Cross River State, in the south; Ogoja is bounded by Ikom and some part of Boki Local Government Areas of Cross River State and Ebonyi State in the east. The major occupation of the people of Ogoja is farming, palm wine tapping, hunting, artisans, traders and both public and civil servants. The farmer grow crops like yam, cassava, potato, rice, millet, guinea corn, groundnut, cocoyam, water yam, palm oil, plantain and banana for their subsistence need and very few left for the market. Fairly large populations of the study area are students. Ogoja houses a campus of the Cross River University of Technology, School of Nursing and Midwifery, some primary and secondary schools, 68 health centers, health post and a private School of health technology and some private hospitals and clinics.

The population for this study included all HIV positive mothers who were registered and were accessing Anti Retro-Viral Therapy (ART) or attending support group meetings in the health facilities (General Hospital Ogoja, and RCM Maternity Hospital, Ogoja) from January-December 2011-2013. They were 92 registered HIV positive mothers in General Hospital Ogoja and 44 from RCM Hospital, making it a total of 136 registered HIV positive mothers. The condition for inclusion in the study include: the respondents must be HIV+ mother, must be accessing ART and belong the support group meeting in the health facilities under study, must have given informed consent to participate in the study. Section A is made up of eight (8) items on respondent's socio-demographic characteristic, while Section B was made up of ten (10) items scored on Yes (1) and No (0) rating scale on the extent to which health system influences the choice of infant feeding options among HIV+ mothers. The instruments were personally administered by the researchers and collected same from the respondents, 100% return rates was achieved. The Chi Square statistical technique was then employed for data analysis. Data generated was analyzed using the Statistical Package for Social Sciences (SPSS) 21.0.

RESULTS AND DISCUSSION

From Table 1, each of the values of the probabilities (p-value) associated with the test statistic is less than 0.05, showing that all of the values of the Chi-square tests was statistically significant. The results of the analysis revealed that availability of qualified personnel providing basic services, (14.194, $P \leq .05$), adequacy of ARVs for pregnant HIV+ mothers, (12.709, $P \leq .05$), the availability of medical equipments for attending to HIV+ mothers, (14.367, $P \leq .05$), giving of basic education on various feeding options to HIV+ mothers, (13.576, $P \leq .05$). This result shows that all these factors are have significant influence on the choices of infant feeding options among HI+ mothers in the study area. This indicated that all the items on health system factors significantly influence the respondents' choices of infant feeding options.

Table 1 Test of the influences of health system factors on infants feeding options

Items	Response option	Feeding options					X ²	p-value
		EBF	RF	MF	df			
There are qualified & available personnel providing basic services	No	12	4	7				
	Yes	75	10	28	2	14.194	.031	
	Total	87	14	35				
Adequate ARVs and other drugs are Available for pregnant and post Partum mother	No	8	2	7				
	Yes	79	12	28	2	12.709	.026	
	Total	87	14	35				
There are adequate equipments for caesarean section, diagnosis and testing of HIV in the health facilities	No	13	5	5				
	Yes	85	15	13	2	14.367	.033	
	Total	98	20	18				
I received basic education on various feeding options in pregnancy & delivery	No	18	6	7				
	Yes	69	8	28	2	13.576	.017	
	Total	87	14	35				

Significant at .05.

The study revealed that all the health system factors significantly influenced infant feeding options. This result is not peculiar to the research area alone, this result supports the earlier finding of Magavero, Norton & Saag (2011) who found out that infant feeding option made by any HIV positive mother is a product of the quality of health information and services available to such a mother during their antenatal services or from other sources available to the HIV+ mothers. Leshabari, Blystad, De-Paoli & Moland, (2007) and Laar and Laar (2012) found out that the type of health system any country has constitutes a great deal to the quality of services rendered to its citizens including HIV counseling, assessment of ARV drugs and other services. This result also confirmed the result of Bloom, Goldbloom & Stevens (2008)

who found out that prevailing climate of acceptance for all individuals, are essential components for encouraging patient-provider relationship linked to adherence of ART and HIV positive care.

This study is a confirmation of what Leshabari, Bystad, De-Paoli & Moland (2007), found out in their studies observed that the high level of stress and frustration among the nurse-counselors has been that the nurses were unable to give qualified and relevant advice to HIV-positive mothers on how best to feed their infants. Nurse counselors were rather confused about the appropriateness of the feeding options they were expected to advise HIV-positive mothers to employ, and perceived both exclusive breastfeeding and exclusive replacement feeding as culturally and socially unsuitable. This is so because whatever infant feeding options adopted by mothers must meet the health status of both the HIV positive mothers and that of their infants, and these information are always provided by the health care system in place. However, 60% counselors believed that formula feeding was the right way for HIV-positive mothers to feed her infant. Most HIV+ mothers expressed lack of confidence in the knowledge of HIV and infant feeding, as well as in their own skills in assessing a woman's possibilities of adhering to a particular method of feeding (Aidam, *et al.*, 2005; Branson, *et al.*, 2006; Abiona, *et al.*, 2006; Anyebe, *et al.*, 2011). Moreover, the nurses were in general not comfortable in their newly gained role as counselors and felt that it undermined the authority and trust traditionally vested in nursing as a knowledgeable and caring profession (Buskens, 2005; Chopra, *et al.*, 2005; Branson, *et al.*, 2006).

Buskens (2005) has earlier posited that mothers were advised by their health care providers during antenatal and post natal session to ensure that they and their infant get the right vitamins by consulting their health care provider who might recommend a continual taking of daily prenatal vitamin until the baby is weaned. Buskens (2005) further observed that due to inadequate health counseling services, most HIV+ mothers take the wrong quality of food and drugs during breastfeeding their infant, this in turn tend to affect the infant's health and weight. The researcher therefore holds that it is very important for breast-feeding mothers to stay hydrated by frequently drinking a lot of water, preferably before they feel thirsty, and to drink more if the mother's urine appears dark yellow. The author further warned that all nursing mothers should be wary of juices and sugary drinks, because too much sugar can contribute to weight gain or make futile their efforts to lose baby's weight. Nursing mothers should avoid too much caffeine which can be troublesome too. Further advised that mothers themselves should not take more than 2 to 3 cups (16 to 24 ounces) of caffeinated drinks a day, caffeine in mother's breast milk might agitate the baby or interfere with the baby's sleep; hence this may affect the infant's health and wellbeing. These mistakes are always made by breastfeeding mothers because of lack of information or poor information made available to the mothers during antenatal and post natal sessions.

Based on the finding of this research, it is therefore concluded that health systems and the programs does significantly influence the choices of infant feeding options based on the quality of information made available to the infant's mother. This information in most rural settings like Ogoja where the research was carried out are always gotten from the health facilities like the General Hospital Ogoja, the RCM Maternity Hospital Ogoja and other health service providers. It is therefore pertinent that health services and health care providers should recruit professional nurses and doctors to provide quality health care services to people that may turn to them for medical advice, help or services. Health system factor were identified as very important factors that can influence infant feeding options among HIV

positive mothers in Ogoja, Cross River state, Nigeria. Based on the findings of this study, the following conclusions were made, that HIV positive nursing mothers attending health facilities in Ogoja, Cross River State identified factors influencing the choice of infant feeding options. That the issue of choosing infant feeding options do not solely depend on one single factor, rather it involves the combination and interaction of other factors.

RECOMMENDATIONS

Based on the findings, the discussion and implications drawn from this study, the following recommendations were made:

- HIV positive mothers should be sensitized by HIV/PMTCT counselors so that they will be equipped with necessary knowledge, information and awareness about the variety of feeding methods to enable them identify proper infant feeding options that best suits their conditions and situation based mostly on their financial conditions..
- The federal ministry of health should make available the guidelines for PMTCT with particular reference to infant feeding for Nigerians, as this will help reduce the confusion on what infant feeding options to adopt by HIV positive mothers.
- NGO's in collaboration with government should organize radio, television, newspaper program that will educate the populace on PMTCT and infant feeding options.
- Government, private investors and nongovernmental organizations should assist rural areas build and equip their health facilities with the state of the art equipment for treatment, diagnosis and for surgical operations. Other equipment that must be provided for the rural health facilities include power generating sets or solar panel, refrigerators, drugs and other consumables needed for the proper functioning of the health facilities.
- Regular visitation of teachers and instructors that are qualified should be sent to the health facilities to give talks to pregnant women especially those that are HIV +. This will help guide them make informed decisions about their infant feeding options within their rural setting.
- Regular visitation and supervision or monitoring of the activities of health care providers in the rural setting should be carried out regularly to make sure they live up to their duties.
- Church leaders, community leaders and community health committees should be provided training so that from time to time, they can visit the women group or in the church they can give health talks to members of the communities, this will go a long way to inform them about the available options for infant feeding mothers.

REFERENCES

Abiona, T.C., Onayade, A. A., Ijadunola, K.T., Obiajunwa, P.O., Aina, O.I., & Thairu, L.N., (2006). Acceptability, feasibility and affordability of infant feeding options for HIV-

infected women: A qualitative study in south-west Nigeria. *Maternal Child Nutrition*, 2: 135-144.

- Aidam, B. A., Escamilla, R. P., Lartey, A., (2005). Lactation counseling increases breastfeeding rates in Ghana. *J. Nutr*; 135: 1691-1695.
- Anyebe, E.E., Whiskey, H., Ajayi, A. D., Garba, S. N., Ochigbo, C.E & Lawal, H., (2011). Pregnant women's knowledge and awareness of prevention of mother-to-child transmission of HIV/AIDS and voluntary counseling and confidential testing uptake in selected Health Centers in Zaria, Nigeria. *Nursing and Midwifery Council of Nigeria Journal* 1(1); 13-18.
- Available at: <http://www.human-resources-health.com/content/5/1/18>
 Available online At <http://www.academicjournals.org/JAHR>,
 Available online [http:// academicjournals.org/JAHR](http://academicjournals.org/JAHR)
- Branson, B. M., Handsfield, H. H., Lampe, M. A. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Morb Mortal Wkly Rep* 2006; 55:1-17. Quiz CE1-4.
- Buskens, I., (2004). *How to counsel infant feeding practices in Southern Africa in a time of HIV/AIDS: infant feeding research program*, Cape Town, South Africa: Bangkok, Thailand, 11-16; 2004.
- Buskens, I.,(2005). *Focusing on counselor-to-mother communication in order to enhance effectiveness and quality of PMTCT infant feeding counseling in Southern Africa* [TuPe5.5P23] : Rio de Janeiro, Brazil, 24.27. 2005.
- Chopra, M., Doherty, T., & Jackson, D. (2005). Preventing HIV transmission to children: Quality of counseling of mothers in South Africa, *Acta Pediatrics*, 94: 357-363.
- De Paoli, M.M., Manongi, R., & Klepp, K., (2004). Breastfeeding promotion and the dilemma posed by AIDS in Tanzania. *Maternal and Child Health List, MCH News #15*. ACC/SCN. Geneva.7 (5) 611-619.
 Doi: 10.1093/cid/ciq048
 DOI: 10.5897/JAHR11.041
 doi:10.1186/1478-4491-5-18,
- Hoat, L.N., Huong, L.T., & Xuan L.T.T., (2010). *Community Health Training and Consulting Network (CHTCN)*. Technical Report for Formative Research: Infant and Young Child Feeding (IYCF) Assessment. Draft. Hanoi: Alive & Thrive.
- Horstmann, E., Brown, J, Islam, F., Buck, J., & Agins, B.D., (2010). Retaining HIV-infected patients in care: Where are we? Where do we go from here? *Clinical Infectious Diseases*; 752-761.
- Laar, M. E., & Laar, K., (2012). Factors influencing the choices of infant feeding of HIV positive mothers in Southern Ghana: The role of counselors, mothers, families and socio-economic status; *Journal of AIDS and HIV Research* 4(1), 1-7,
- Laar, S.A & Govender, A. (2011). Factors influencing the choices of infant feeding of HIV-positive mothers in South-Ghana. The role of counselors, mothers, families and socio-economic status. *Journal of AIDS and HIV Research*, 3;129-137.
- Leshabari, S. & Sebalda, C., (2008). *Infant feeding in the context of HIV infection: mothers' experiences and program implications for maternal and child health services in Tanzania*. The university of Burgen, 29-Feb; ISBN: 978-82-308-0526-8.
- Leshabari, S.C., Blystad, A., De Paoli, M. & Moland K.M., (2007). HIV and infant feeding counselling: challenges faced by nurse-counselors in northern Tanzania, *Human Resources for Health* 2007, 5:18
- Magavero, M.J., Norton, W.E., and Saag, M.S., (2011) Health Care System and Policy Factors Influencing Engagement in HIV Medical Care: Piecing Together the Fragments

of a Fractured Health Care Delivery System; *Clinical Infectious Diseases*, 52 (suppl 2): S238-S246.

- Maru, Y. & Haidar, J., (2009). Infant feeding practice of HIV positive mothers and its determinants in selected health institutions of Addis Ababa, Ethiopia, *Ethiopian Journal of Health Development*, 23(2), 107-114
- McNaghten, A.D., Wolfe, M.I, Onorato, I. (2007). *Improving the representativeness of behavioral and clinical surveillance for persons with HIV in the United States: the rationale for developing a population-based approach*. *PLoS One* 2007; 2550.
- Minnie, C.S. & Greeff, M., (2006). The choice of baby feeding mode within the reality of the HIV/AIDS epidemic: health education implications. *Curationis*; 29(4): 19-27.
- Mohammed, A., Shehu, A.U., Aliyu, A.A. and Zoaka, A.I., (2010) Infant feeding options, practices and determinants of feeding practices among HIV sero-positive mothers in Abuja, Nigeria. *Nigerian medical journal*.51,(1) 14-17
- Moses, A., Chama, S., Udo, S., & Omotora, B. A., (2009). Knowledge, attitude and practice of antenatal attendance towards PMTCT of HIV –infection in a tertiary health facility, Northeast-Nigeria. *The Internet Journal of Third World Medicine*.8 (1) 580-594.
- Ngare, D., Njagi, E., Hassan, A., Meme, J., Wangai, M., Chebet, K. & Kimathi, Journal.,(2007). *Community's Knowledge, attitudes and practice on MTCT OF HIV Challenges*, Addis Ababa Region 14 Health Bureau, Activity report, Addis Ababa; 2006/2007.
- Rea, M.F., dos Santos, R.G., & Sanchez-Moreno, C.C., (2007). Quality of infant feeding counseling for HIV+ mothers in Brazil: challenges and achievements. *Acta Paediatrica*; 96(1); 94-99.
- Sadoh, W. E, A.E Adeniran, K.A. & Abhulimhen-Iyohas, B. I.,(2008). Infant-feeding practices among HIV- infected mothers in HIV-treated programs. *Journal Health Population Nutrition*. 26(4); 463-467.
- Schneider J, Kaplan SH, Greenfield S, Li W, , & Wilson IB, (2004). Better physician-patient relationships are associated with higher reported adherence to antiretroviral therapy in patients with HIV infection. *Journal Gen International Medicine* 2004.19; 1096-1103.
- Seidel, G., Sewpaul, V., & Dano, B., (2010). Experiences of breastfeeding and vulnerability among a group of HIV+ women in Durban, South Africa. *Health Policy and Planning* 15; 24-33.
- Sethuraman, K., Hammond, W., Hoang, M.A., Dearden, K., Nguyen, M.D., Phan, H.T., & Nguyen, N.T., (2011). *Challenges for Safe Replacement Feeding among HIV-Positive Mothers in Vietnam: A Qualitative Study of Mothers, Fathers, Health Care Providers, and Other Experts*
- Suuk, A.L. & Veloshnee, G. (2011). Factors influencing the choices of infant feeding of HIV positive mothers in Southern Ghana: The role of counselors, mothers, families and socio-economic status , *Journal of AIDS and HIV Research*. 3(7); 129-137,
- Swarts, S., Kruger, H.S. & Dolman, R.C. (2010). Factors affecting mothers' choice of breastfeeding vs. formula feeding in the lower Umfolozi district war memorial hospital, KwaZulu-Natal *Journal of Interdisciplinary Health Sciences*, 15(1); 26-38
- Throne, C., Semenenko, I., Pilipenko, T. & Malyuta, R., (2009). Progress in Prevention of Mother-to-Child Transmission of HIV infection in Ukraine: results of a birth cohort study. Available at [http:// www.biomedcentral.com/1471-2334/9/40](http://www.biomedcentral.com/1471-2334/9/40). (Accessed 25/07/2014).

- Varga, C. A., Sherman, G.G. & Jones, S. A. (2006). HIV-disclosure in the context of vertical transmission: HIV-positive mothers in Johannesburg, South Africa. *AIDS Care*; 18(8): 952-960.
- World Health Organization (2011). HIV transmission through breastfeeding. A review of Available Evidence, Geneva; WHO, 2011.
- World Health Organization (WHO). (2006). Interagency Task Team on prevention of HIV infection in pregnant women: Guidance on global scale up of the prevention of mother-to-child transmission of HIV. Towards universal access for women, infants and young children and eliminating HIV and AIDS among children, Geneva: WHO.
- Young, S. L., Mdudua, N. N., Mbuya, E., Chantry, C., Geubbels, E. P., Israel-Ballard, K., Cohan, D., Vasti, S. A & Latham, M. C., (2011). *Current knowledge and future research on infant feeding in the context of HIV*