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Maternal and infant factors as determinants of infant feeding options among HIV positive mothers in Cross River State, Nigeria

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ABSTRACT: *This survey study was conducted on maternal and infant factors influencing the choice of infant feeding options among HIV positive mothers attending health facilities in Ogoja, Cross River State. The major objective of the study was to investigate how maternal and infant factors influence the choice of infant feeding options among HIV positive mothers in Ogoja, Cross River State. Two research questions and two null hypotheses were formulated to guide the study. The studied population was all HIV positive mothers attending health facilities in Ogoja from January-December 2011-2013, with a total of 136 registered HIV positive mothers. Using the purposive sampling techniques, the total population was included in the study. Data collection was done using structured questionnaire divided into two sections. After data collection has been done and coded appropriately, Chi-square statistical analysis was used to analyze data. The result of data analyses shows that maternal factors influence the choices of infant feeding options adopted by HIV+ mothers,(mothers infant feeding decision (13.374<.0.68), the health condition of the mothers (x^2 = 12.436, p<.002), the limited time to breastfeed the baby because of work (x^2 = 11.065, p<.05) and the size of mother's nipple and other breast conditions (14.107< 0.212). the result further shows that there some infant factors that significantly influenced HIV positive mothers' choice of infant feeding option (baby with cleft and physical deformed lips (x^2= 11 .794, p>.05), baby's refusal to take breast milk (x^2 = 18.318, p<.05) and baby's health condition (x^2 = 10.493, p>0.474). the study therefore found out that maternal health condition, limited time to breast feed baby because of work and baby's refusal to take breast milk had significant influence on infant feeding options. Based on the findings it was recommended that HIV positive mothers should be sensitized by HIV/PMTCT counselors with necessary knowledge for the choice of infant feeding options, these choices must be made by the HIV+ mothers based on their prevailing conditions.*

Keywords: maternal factors, infant factors, infant feeding options, HIV+ mothers and PMTCT

Introduction

Globally, the incidence of the spread of the HIV pandemic is worrisome; this is because the spread of the virus has taken an alarming dimension in recent times. The rate at which infants are contracting the virus from HIV infected mothers in recent times has become even more worrisome. An estimated 590,000 infants acquired HIV-1 from their mothers in 1998; 90% were in SubSaharan Africa. About two-thirds were infected during pregnancy or at delivery and the other one third through breastfeeding (Okon, 2011). This number has increased geometrically within the last fifteen years. In 2008, about 1,000,000 infants born of HIV infected parents tested positive, and about 78% of these numbers are in Sub- Saharan Africa, while in 2009, Nigeria had about 672,000 infants born of HIV infected mothers out of which about 597,000 tested positive (Federal Ministry of Health (FMoH), 2011).

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The balance between life saving benefits and the risk of transmission through breastfeeding complicates infant feedings in communities affected by HIV. Cognizant of the problem, UNAIDS\WHO\ UNICEF in 2008 developed a guideline in the context of infant feeding by women whose HIV status is unknown and HIV positive women. The feeding option for women whose HIV status is negative or unknown is to exclusively breastfeed their newborn for the first six months, introduce complementary food after six months and continue breastfeeding for two years and beyond. The recommended option for HIV positive women is, avoid breast feeding when Replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) (Maru & Haidar, 2009, Okon, 2011). Nonetheless, when AFASS criteria cannot be met, mothers may be advised to exclusively breast feed and avoid mixed feedings. Other feeding options recommended are; heat treated expressed breast milk or wet nursing of the newborn by HIV negative surrogate mothers (Adejuyigbe, Orji, Onayade, Makinde and Anyabolu 2008: Chopra and Rollins 2008). Various factors have been adduced as responsible for the choices of infant feeding options made by HIV+ mothers. But to what extent these factors influence these choices of infant feeding options amongst HIV + mothers leaves more to be desired.

In Nigeria where most women breastfeed, there is an additional risk. About 800,000 were infected out of 5.8 million in 2003 were infants and children of which 90% of these got infected through their mothers, occurring at three levels; antepartum, intrapartum and breastfeeding (Okon, 2011). There is no cure for HIV currently available, but prevention of mother to child transmission (PMTCT) appears to be the most important intervention. American International Health Alliance (AIHA, 2008) in Ajayi, Hellandendu and Odekunle (2011) posited that ‘’there is no cure for HIV, but prevention of vertical transmission of HIV to include voluntary counseling and testing, (VCT) , ante-retroviral therapy, elective caesarean section; replacement of infant feeding or modified breastfeeding, and restrictive use of invasive procedure such as artificial rupture of membrane, (ARM),episiotomies and cleansing of the birth canal with a microbite during labor and delivery. Sadoh, Adeniran & Abhulimhen-Iyohas (2008) opined that exclusive breastfeeding is the ideal practice among HIV infected mothers in the first six months of life, as recommended currently, followed by replacement feeding (any formula food rather than breast milk) depending on the acceptability, feasibility, affordability, sustainability and safety (AFASS) of the later (Okon, 2011; Anyebe, et al, 2011).

Okelle (2011), cited in Didiza-Maganga, (2012) observed that babies have specific nutritional needs and are born with an underdeveloped immune system. Therefore, they need food like breast milk to meet these demands. The Federal Ministry of Health (FMOH, 2011) adopted WHO (2006) guidelines that emphasize breastfeeding values exclusively for the first six months of life, once a mother is on ARVs, then with the introduction of appropriate complementary food while continuing breastfeeding for up to two years and beyond with HIV infected mothers. It also stated that antiretroviral (ARVs) drugs should be made available for HIV positive mothers to reduce the risk of transmission through breastfeeding until one week after the end of breastfeeding and strongly recommends that all mothers including HIV infected mothers should breastfeed their infants (Adejuyigbe, et al.,2008; Maru and Haidar, 2009).

The health status of a mother determines the feeding options which such mother should adopt or practice. Matji et al., (2008) observe that mothers with records of some communicable diseases should confide in their health service providers to counsel them on the choices of infant

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feeding options to be adopted. Some mothers have cracked nipple, inverted nipple, diabetes, tuberculosis, hepatitis among others. In this case, these mothers are not expected and should not attempt breast feeding their babies either directly or through expressed and pasteurized process, since this breast milk is detrimental to the health of the child (Suuk and Veloshnee 2012). Breastfeeding significantly improves child survival by protecting against diarrheal diseases, pneumonia and other potentially fatal infections, while it enhances quality of life through its nutritional, psychosocial and many other benefits. As a result, not breastfeeding presents substantial disadvantages and risks to both children and mothers. Balancing the risks of not breastfeeding, such as increased child morbidity and mortality, versus the risk of HIV transmission through breastfeeding, presents a serious dilemma particularly for mothers in poorer countries, and also for policy makers and health workers (Leshabari and Sabalda, 2008; Okon, 2011; Sethuraman, et al. 2011).

Branson, Handsfield and Lampe (2006) in their comparative study on revised recommendations for HIV testing of 25 adults, 15 adolescents and 60 pregnant women in health-care settings found out 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. The study further presented evidence that to some extent, breastfeeding does not have an adverse effect on health of HIV-positive mothers (Branson, et al., 2006; Bloom, Goldbloom & Stevens, 2008). In Okon (2011) study in Calabar, it was observed that there is no need for a mother to go on any special diet while breast-feeding her baby. Instead, she should focus on making healthy choices to help fuel her milk production and consider the health of the infant.

The study further observed that eating a variety of different foods while breast-feeding will change the flavor of the mother's breast milk. This will expose the infant to different tastes, which might help him or her more easily to accept solid foods afterwards. In another study by Buskens (2005) HIV+ mothers were advised to ensure that they and their infant get the right vitamins by consulting their health care providers who might recommend a continual taking of daily prenatal vitamin until the baby is weaned. Buskens (2005) further observed 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 (Minnie & Greeff, 2006; Leshabari, et al., 2007; McNaghten, Wolfe & Onorato, 2007; Joan et al., 2009).

Iliff, et al. (2005) observed that availability of information on the choice of infant feeding to HIV positive mothers is considering the complexity of information to be imparted, informed decision-making also faces educational challenges related to common misperceptions regarding HIV/AIDS and mother-to-child transmission of HIV. The widespread belief that all babies of HIV-positive mothers will be born infected which is

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documented in various studies (Kuhn, Aldrovardi and Sinkala 2007; Kumwenda, Hoowever and Mofenson 2008; Doherty, et al., 2006; Bezner-Kerr, et al., 2007; Arendt, et al., 2007) would need to be countered with accurate information on the rate of mother-to-child-transmission and current understanding of the risk of transmission through different routes. Senyonga, Muwonge and Nankya (2004) and Maru, and Haidar, (2009) observed that women are expected to assume responsibilities for infant feeding decisions, and also to bear the consequences of whatever method they choose. They should be allowed to voice personal values and preferences related to the options, and make informed choices under conditions of uncertainty about possible outcomes. Eide, *et al.* (2006); Rea, Dos-Santos and Sanchez-Moreno (2007) and Becquet, *et al.*, (2008) observed that by learning from those who must make decisions and live with these hard choices, public health workers will be in a better position to offer advice. There have been relatively few reports, and even fewer published studies, on women's views of infant feeding options, including exclusive breastfeeding, animal milks, wet nursing, heat treating expressed breast milk and others. There is also the paucity of data on the perceptions of mothers as decision-makers in guiding policies and counselors' advice (Becquet, *et al.*, 2008; Throne, *et al.*, 2009; Swarts, Kruger & Dolman, 2010).

Oguta, Omwega & Sehmi (2004); Throne, et al. (2009) observed that certain factors are considered by HIV positive mothers in choosing the infant-feeding option, these factors include: the ability to implement the options without interference from significant others, affordability, and socio cultural acceptability. Knogwledge of the selected option, safety feasibility, its advantages and disadvantages, were important factors. Nurses and midwives have to educate clients and support them in their choices of infant-feeding methods that is acceptable for the promotion of the health of infants and mothers. The issue of maternal stress is another factor. Hofmann, *et al*. (2009) observed that maternal stress can result from the physical and emotional changes of pregnancy. This causes changes in the body, including increased muscle tension, faster breathing, quicker heartbeat and increased blood pressure. The authors further observed that how a HIV positive pregnant woman deals with stress can make a difference in her physical and emotional well-being. It may even affect her baby while still in the womb or after birth. Shifts in hormone levels also influence a woman's psychological state. High levels of stress can adversely affect pregnancy and the health of the new born baby. There are possible relationship between stress and premature labor and low birth weight. These are significant contributors to the type of infant feeding options to be adopted since feeding is a function of maternal decision (Malawi Government, 2008).

Fjeld, et al. (2008) further observed that women with a combination of high stress levels and medical risk factors have a risk of premature labor. This adversely affects their choices of infant feeding options. Factors that affect HIV positive mother's ability to handle stress include personality, physical and mental health, living conditions, economic status, maturity and support. Stress management techniques such as meditation and other self-awareness programs can help alleviate stress. Walking and regular exercise programs are good options. One of the best ways to help prevent stress is to obtain early, comprehensive and continuous prenatal care. Another maternal factor is Diabetes, this is a disorder in which the body does not produce enough insulin or does not utilize insulin properly. Without treatment, high levels of sugar can accumulate in the blood and damage organs, including blood vessels, eyes, and kidneys. Babies of all diabetic women are at increased risk of health and feeding problems arising during the

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newborn period, including respiratory distress, low blood sugar and calcium levels, jaundice and impaired feeding. All pregnant women with diabetes should follow a special diet and exercise. When lactating mothers are diabetic or have a diabetic history, they make informed decision about their infant feeding options. This condition can also be hereditary, thereby further compounding the feeding attitude of the infant (Kuhn, et al., 2007 and Lise & Bula, 2010).

Kuhn, et al. (2005); Laar & Govender (2011) and Laar & Laar (2012) observed that maternal nutritional status has been found to play a role in infant feeding choices among HIV positive mothers. Vitamin A deficiencies in HIV-infected women increases the likelihood that they will transmit the virus to their infants. The infections of the placenta and the umbilical cord are associated with increased mother to child transmission (MTCT) of HIV. Infections such as sexually transmitted infections (STIs), anemia and malaria reduce the effectiveness of the placental barrier against fetal infections. Prematurity may be a consequence of infections such as STIs, HIV and malaria, or may be due to poor maternal nutrition. Aidam, Escamilla & Lartey (2005) however found out that most newborn babies whose mothers use heroin during the gestational period often exhibit withdrawal symptoms at birth and are more likely to have attention problems and health issues as they grow up. It was further posited that the use of stimulants like methamphetamine and cocaine during pregnancy are linked to a number of problems for the child; such as low birth weight, small head circumference and motor and cognitive developmental delays, as well as behavioral problems across childhood. This also leads to difficulties in child feeding, hence the need for the choices of infant feeding options among HIV positive mothers (KMOH, 2007; Kumwenda, Hoowever & Mofenson, 2008; Laar & Govender, 2011; Magavero, Norton & Saag, 2011). When expectant mothers take drugs during gestational period, it may lead to *Down syndrome.* This is a combination of birth defects including some degree of mental retardation and characteristic facial features. About 30 to 50% of babies with Down syndrome also have congenital heart defects, and many have visual and hearing impairment and other health problems. The severity of these problems varies greatly. Down syndrome is one of the most common genetic birth defects. In Minnie and Greeff (2006) maternal health indicators like weight loss, anemia and mastitis are evidence of baseline health status. Sadoh et al. (2008) then concluded from evidence that regardless of baseline health status, no significant associations was found from anemia or weight loss (Laar & Govender, 2011; Magavero, Norton & Saag, 2011).

Infant factors also play a central role in the choices of infant feeding options adopted by HIV positive mothers. When children are born with *Cleft Lip and Palate, they find it difficult to suck.* Cleft is an opening in the lip, the roof of the mouth, or the soft tissue in the back of the mouth. These openings are normally present in early fetal development, and usually close by the tenth to twelfth week of pregnancy. They fail to close in approximately one in every 700 babies born (McNaghten, Wolfe & Onorato, 2007). Kakute,et al. (2005) further opined that the causes of cleft lip and palate are not well understood, some may be as a result of a combination of genetic elements with environmental factors, such as drugs, infections, maternal illnesses, and possibly deficiency of folic acid. Children with clefts have special problems, particularly with feeding, ear diseases and speech development, as well as dental problems. Little is known about how to prevent clefts, because fetuses with certain predisposing gene may be at increased risk of developing cleft palate if their mothers smoke (Joan, et al., 2009). Other factors, such as maternal alcohol abuse, and maternal diabetes

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have been linked to increased risk of clefts. In situations like this, the child may find it difficult to hold the nipple of the mother properly; hence the mother must find an alternative option of feeding the child (McNaghten, Wolfe and Onorato 2007). Another infant factor that can determine the choices of infant feeding options is the weight of the baby at birth. This is a medical condition called l*ow Birth weight*, and these babies may face serious health problems, and are at increased risk of long term disabilities. It was discovered by Hoat, Huong & Xuan (2010) that children with low birth weight weigh between 5 pounds, 8 ounces or less at birth. Very low birth weight goes as low as 3 pounds, 5 ounces or less. Preterm births occur before the 38th week of pregnancy. However, HIV positive mothers medical problems influence birth weight, especially if she has high blood pressure, diabetes, certain infections or heart, kidney or lung problems. This is also a hereditary factor from the mother to the child which the child suffers at infant stage, and can also influence the choices of infant feeding options adopted by the HIV positive mothers for the health of her child (Latham & Preble, 2006; Hofmann, et al., 2009; Horstmann, et al., 2010; Magavero, Norton and Saag, 2011).

A premature baby may be anemic; infants born too soon may not have had enough time to store iron. Low-birth weight babies may not have enough fat to maintain a healthy body temperature. Bleeding in the brain, which can be one of the most severe results of low birth weights, happens in 40 to 45% of every low-birth weight infants. Premature babies often have a potentially dangerous heart problem that affects their infant feeding options. Lifesaving equipment in intensive care nurseries helps sustain low-birth weight babies who otherwise might not survive. The most important prevention is early and regular prenatal care. Women who receive this care can learn good health habits and ways to reduce the risk of having a low-birth weight baby or alternate means of feeding them to survival Heck, et al., 2005, Didiza-Maganga, 2012). Based on the review carried so far, it has been established that there are factors which influences the choices of infant feeding options among HIV+ mother but specifically, this study seeks to examine how maternal and infant factors influence the choice of infant feeding option among HIV + mother in Ogoja Local Government Area of Cross River State, Nigeria.

Methodology

The descriptive survey research design was adopted for this study; the research design approach is present-oriented and based on on-going event as it provides a detailed description of existing factors influencing infant feeding options of HIV positive mothers. The study was carried out at General Hospital Ogoja and Roman Catholic Mission (RCM) Maternity Hospital Ogoja, Ogoja Local Government Area of Cross River State, Nigeria. The RCM Hospital is owned by the Roman Catholic Mission. The people of Ogoja are predominantly farmers; they grow crops like yam, cassava, potato, rice, millet, guinea corn, groundnut, cocoyam, water yam, palm oil, plantain and banana, there are civil and public servants, artisans, businessmen and women, other self employed persons, while a fairly large populations of the study area are students. In terms of medical facilities for HIV, CT and accessing ARVs, other support services for HIV positive client and non positive clients are accessed at General Hospital Ogoja and the RCM Maternity Hospitals that has facilities for ARVs. The target 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

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136 registered HIV positive mothers. The sample used for this study was the total population, comprising of all the 136 registered HIV positive mothers in General Hospital and RCM Maternity Hospital Ogoja. Data was collected using structured questionnaire divided into two sections on maternal and infant factors influencing the choice of infant feeding options among HIV positive mothers developed by the researcher, with a yes or no response options. Every professional and ethical consideration was observed during the course of data collection. The researcher and research assistants administered the 136 copies of the questionnaire directly to respondents during their support group meetings and their routine assessment of ARVs; same questionnaires were collected same day. Questionnaire was coded and a database was created. Data generated was analyzed using the Statistical Package for Social Sciences (SPSS) 21.0 version. Chi-square non-parametric statistics was employed to analyze data at 0.05 significance level.

Results and discussion

Table 1: Chi-square test of influence of maternal factors on choices of infant feeding options among HIV positive mothers

Questionnaire		Response option	Feeding options					
	ITEM		**EBF**	**RF**	**MF**	**Df**	**X^2**	**p-value**
	I take decisions for my baby's feeding Method	No	28	8	8			
		Yes	59	6	27	2	13.374	.068
		Total	87	14	35			
	My health condition may affect Baby's feeding	No	50	8	8			
		Yes	37	6	27	2	12.436	.002
		Total	87	14	35			
	I have limited time to breast feed my Baby because of work	No	77	10	22			
		Yes	10	4	13	2	11.065	.004
		Total	87	14	35			
	Because of the size of my nipple, my Baby cannot breastfeed well	No	81	12	29			
		Yes	6	2	6	2	14.107	.212
		TOTAL	87	14	35			

*Significant at .05 levels

KEY: EBF-Exclusive Breast Feeding; RF-Replacement Feeding & MF-Mixed Feeding

In Table 1, all the items listed as factors significantly influenced HIV positive mothers' choice of infant feeding options. These factors are mothers infant feeding decision (13.374<.0.68), the health condition of

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the mothers (x^2 = 12.436, p<.002), the limited time to breast the baby because of work (x^2 = 11.065, p<.05) and the size of mother's nipple and other breast conditions (14.107< 0.212)/ the result of the chi square analysis shows that maternal factors influence the choices of infant feeding options adopted by HIV+ mothers.

Table 2 Result of Chi-square test of infant factors influencing the choices of infant feeding options

Item		Response option	**Feeding options**					
	ITEM		**EBF**	**RF**	**MF**	**df**	**X^2**	**p-value**
	Because I have a baby with Deformed lip, the baby cannot suck	No	83	14	33			
		Yes	4	0	2	2	12.794	.672
		Total	87	14	35			
	My baby refuses to take breast milk	No	83	8	29			
		Yes	4	6	6	2	18.318	.000
		Total	87	14	35			
	Because of my baby's health condition my baby cannot suck breast	No	85	14	33			
		Yes	2	0	2	2	10.493	.474
		Total	87	14	35			

*Significant at .05.

Table 2 showed that infant factor such as baby with cleft and physically deformed lips (x^2= 11 .794, p>.05), baby's refusal to take breast milk (x^2 = 18.318, p<.05) and baby's health condition (x^2 = 10.493, p>0.474) were factors that significantly influenced HIV positive mothers' choice of infant feeding option.

Discussion

Finding from the study found out that mothers infant feeding decision (13.374<.0.68), the health condition of the mothers (x^2 = 12.436, p<.002), the limited time to breastfeed the baby because of work (x^2 = 11.065, p<.05) and the size of mother's nipple and other breast conditions (14.107< 0.212) were significant factors influencing the choices of infant fedding options adopted by HIV + mothers.

The result of the chi square analysis shows that maternal factors influence the choices of infant feeding options adopted by HIV+ mothers. The above findings agreed with Buskens (2005); Bland et al., (2007a); Okon (2011) and Laar and Laar (2012) who held that it is worthy of note that women with certain health conditions/problems like hepatitis, HIV and STI's are likely to pass it on to their infants, hence may change their infant feeding options. The finding of this study also revealed that babies with cleft and physically deformed lips (x^2= 11 .794, p>.05), baby's refusal to take breast milk (x^2 = 18.318, p<.05) and baby's health condition (x^2 = 10.493, p>0.474) were factors that significantly influenced HIV positive mothers' choice of infant feeding option. This finding is in agreement with the view of

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McNaghtan et al., (2007) who found out that infant with certain abnormalities refused breast milk. Minnie and Greeff (2006) and Ome-Gliemann et al., (2006) then added that certain health conditions of a mother like mastitis make her breast milk sore, causing baby to refuse sucking. Hoat, Huong & Xuan (2010) also observed that prematurity in infant results in low birth weight, which can influence the choice of HIV positive mother's feeding options. It is therefore necessary to state that globally, maternal and infant factors have significant influence in the choices of infant feeding options adopted by HIV+ mothers.

Recommendations

- HIV positive mothers should be sensitized by HIV/PMTCT counselors so that they will be equipped with necessary knowledge to enable them identify proper infant feeding options.
- Training and retraining workshops and refreshers course should be organized for counselors and other health service providers to ground them on the basic information needed to be handed down to prospective mothers and HIV+ mothers.
- Support programs should also be mounted for these HIV + mothers to treat their health conditions given the fact that most of these HIV+ mothers may not be able to afford the cost of taking proper care of their health coupled with their health and financial conditions.
- HIV positive mothers should be desensitized from this urge of stigmatization and gratification. There is need for seminars, workshops and outreach programme to be periodically organized and implemented in order to equip these health service (workers) providers towards utilizing their inner potentials and be made to understand that there is more to life even with HIV infection.

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