

Journal of AIDS and HIV Research

Volume 8 Number 6 July 2016

ISSN 2141-2359



*Academic
Journals*

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Full Length Research Paper

Risk factors of suicidality among HIV positive subjects in a treatment centre, Kaduna Metropolis, Nigeria

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Received 21 October, 2015; Accepted 31 May, 2016

Suicide behaviour complicates human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS). Some of the risk factors attributed to this behavior include stigmatization, depression, cultural beliefs, deterioration in physical condition and overwhelming infections. The aim of this paper is to identify the risk factors of suicidal behaviour among HIV respondents in an antiretroviral treatment centre in Kaduna metropolis. This will also present opportunity for primary prevention of suicide among these respondents. The study was a cross sectional, descriptive study involving two hundred and fifty HIV positive respondents, selected through convenience sampling. Two self-administered questionnaires (sociodemographic and Beck depression inventory) were given to the subjects to fill after receiving written consent. All the participating subjects were interviewed for suicidality using suicidality module of MINI and also clinically examined by the author. The statistical package for social science (SPSS), 15th edition was used for analysis. Multiple logistic regression analysis was used to identify predictors of suicidality. Level of significance was set at $p < 0.05$. The prevalence of suicidality among these patients receiving antiretroviral care at AIDS Relief Centre of St-Gerard Catholic hospital was 16% while the prevalence of depression among the subjects was 26%. Factors significantly associated with suicidality in this study were depression ($p = 0.000$; $\chi^2 = 37.645$, $df = 1$), reaction to illness by friends, colleagues, and relation ($p = 0.000$; $\chi^2 = 26.5$, $df = 2$), past psychiatric history ($p = 0.023$; $\chi^2 = 1$, $df = 1$), physical state of the patient ($p = 0.0016$; $\chi^2 = 5.787$, $df = 1$), and previous suicidal attempt ($p = 0.000$; $\chi^2 = 66.17$, $df = 1$). On multiple regression analysis, depression ($p = 0.000$; odd ratio = 11.242 and 95% CI = 4.147 to 30.478) and reaction to illness by friends, relation and colleagues ($p = 0.032$; odd ratio = 0.193 and 95% CI = 0.043 to 0.866) were found to be predictors of suicidality. The more severe the depression, the higher the rate of suicide behaviour. Predictor ($p = 0.000$, odd ratio = 64.68 and 95% = 10.33 to 1388). The implication of this finding is that suicidality complicates HIV/AIDS disease among infected subjects in Nigeria. Therefore, there is need for prompt recognition of risk factors to suicidality and the need to prevent it among these subjects.

Key words: HIV/AIDS, risk factors, suicide behavior.

INTRODUCTION

According to World Health Organization, between 0.5 and 1.2 million people worldwide die from suicide each year (World Health Organization, 2000). Suicidal ideation, attempted suicide and suicide are complex clinical issues

associated with life-threatening medical conditions and this has been reported for human immunodeficiency infection (Kelly et al., 1998). The risk factors of suicide are diverse and inter related and may be particularly

complex in HIV infected individuals (Govender and Schlebusch, 2013). Depression as one of the risk factors of suicidality is also common psychiatric complications associated with HIV disease. In Nigeria, depression has been found to be five times more common among people living with HIV/AIDS (PLWHA) than in apparently healthy populations (Chikezie et al., 2013). Olley (2007), in his report on assessment of psychiatric morbidity in recently diagnosed HIV patients in South Africa, using MINI questionnaire, revealed the following prevalence rates: Current depression = 38.7%, dysthymia = 28%, suicidality = 8.7%. Audu et al. (2008) in a 5-year retrospective study of 58 HIV positive patients confirmed by Western Blot assay at Jos University Teaching Hospital, Nigeria reported the prevalence of psychiatric disorders as follows: Depression (36.2%); delirium (22.4%); psychosis (19%) and dementia (10.3%). Others are Mania (6.9%); anxiety (1.7%); psychoactive substances (mainly alcohol) were used by 20.7% of the subjects. In their conclusion, they suggested the need for a multidisciplinary approach in the management of HIV/AIDS patients (Audu et al., 2008).

In another study in one of the other North Central states of Nigeria, prevalence rates of depression among HIV positive patient was reported as high as 56.7% (Shittu et al., 2013). In a study conducted in Ogun, Oyo and Osun South western states of Nigeria by Kola et al in 2005, responses of a representative sample of 2,183 persons were sought to a question concerning their attitudes to the provision of care for people living with HIV/AIDS. Their opinions were also sought regarding the provision of a group home in their neighborhood for the care of persons with a range of medical and social conditions such as AIDS, mental retardation, physical disability, drug abuse problems, mental illness and exconvicts. The study observed that there was a high level of rejection by individuals and the community as a whole to the care of people living with HIV/AIDS than to the care of persons with other medical and social problem (Kola et al., 2005). International findings on correlation between suicide and HIV/AIDS are diverse. The results however show compelling evidence to screen for suicide risk and intervention as early as possible (Catalan et al., 2011; Badiee et al., 2012). This study sought to identify the risk factors of suicide and also help in determining those who have the potential to perfect complete suicide in primary prevention interventions.

METHODOLOGY

Study design

This is a cross sectional descriptive study.

Setting

The study was conducted at St-Gerard's Catholic Hospital, Kakuri, Kaduna South L.G.A. of Kaduna State, Nigeria. This mission hospital was established in 1957 and presently has 230 admission beds. The AIDS relief anti retro-viral treatment (ART) project of USA President's Emergency Plan for AIDS Relief (PEPFAR) is a program under the supervision of the hospital. It was established on the 6th of February, 2006 with the aim of providing quality care and treatment for people living with HIV/AIDS (PLWHAS) in Kaduna State. The centre has 67 staff strength, 13 different units and is being headed by project team leader, an experienced general medical practitioner. They run five (5) out-patients clinic per week, 4 adult and 1 pediatrics clinics. The total registered number of patients stands at 5,626 with 1,891 males and 3,735 females.

Study population

Inclusion criteria

The inclusion criteria were registered, 18 years and above HIV positive clients that can read and write in English language.

Exclusion criteria

This included those who are too physically and mentally ill to participate in the study and those who decline to participate despite explanation and re-assurance.

Sample size

Using appropriate statistical formulae, the sample size was calculated to be 234,577 at an average estimated prevalence of suicidality among HIV positive patients from previous studies as 18.8% (Kelly et al., 1998; Olley, 2007; Perry et al., 1990). The minimum number was rounded up to 250 for conveniences in data analysis. Purposive random sampling technique was used to obtain the minimum size of 250 respondents.

Instruments

1. Socio-Demographic Questionnaire: Age, sex, marital status, education, occupation.
2. The mini international neuro-psychiatric interview: This instrument was designed as a brief structured interview for the major Axis 1 Psychiatric disorder in DSM IV and ICD10. It has acceptably high validity and reliability scores (Sheehan and Lecrubriar, 2005).
3. Beck depression inventory: The instrument is a 21-item self-administered questionnaire. Each item contains four possible responses which range in severity from 0 to 3. Each respondent was expected to pick the one that best describes the way he feels. The scoring system involves adding up the points. The cut off for screening of depression is score of 18 and above.

Procedure

The setting of the study was at the outpatient clinic of AIDS relief

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project of the St. Gerard's Catholic Hospital, Kaduna. About 15 to 20 subjects participated on daily basis for a period of 4 weeks (November to December, 2009). On each participating day, the patients were addressed on the purpose of the study and those eligible to participate. Those that initially gave verbal consent were taken to the unit seminar apartment that had a consulting room. These patients were further assured of confidentiality and the possibility of declining further participation at any stage of the study. Each subject was given a pencil containing eraser and 2 self-administered questionnaires (socio-demographic questionnaire and Beck's depression inventory) after taken a written consent. The seating arrangement was done to ensure privacy in completion of the questionnaires. After completion of the questionnaire, each of the respondents was interviewed for Suicidality using Suicidality module of MINI and subjects who scored 18 and above on Beck's depression inventory were further interviewed for diagnosis of depression using major depressive disorder module of MINI. 20 of 183 subjects who scored below 18 on BDI were also interviewed to correct for misclassification rules (false negative results). Every subject that participated in the study was also physically examined by the author in the presence of one of the unit nurses and subsequently grouped into one of the 4 (i-iv) stages of HIV/AIDS disease (WHO, 2003).

A laboratory form was filled for each of the subjects to test for current CD4 cell counts. Laboratory investigations like full blood counts, chest x-ray, sputum examination are all paid for by the HIV positive patients like other patients. However CD4 cell counts is free of charge if the patient is registered with the centre. Subjects found to be depressed and suicidal were referred to the nearest psychiatric facilities for further assessment and management.

Data analysis

The statistical package for social science (SPSS), 15th edition was used for analysis. Descriptive statistic such as mean and standard deviation were calculated. Chi-square was used for categorical variables analysis. Multiple logistic regression analysis was used to identify predictors of suicidality. Level of significance was set at $P < 0.05$.

Ethical considerations

Permission was obtained from the Ethical committees of the Federal Neuro-Psychiatric Hospital Barnawa, Kaduna and that of St. Gerard's Catholic Hospital Kaduna. Informed consent were also obtained from all HIV positive patients that participated in the study. Opportunity to decline participation at any stage of the study was given and confidentiality also assured.

RESULTS

Socio-demographic characteristics of the subjects

The socio-demographic characteristics of the subjects are shown in Table 1. Two hundred and fifty subjects participated in the study. All subjects were on outpatient treatment with 234 (93.6%) of them currently on antiretroviral medications while 16 (6.4%) were yet to be commenced on medications. The state of origin of the subjects spread across the 6 geo-political zones of Nigeria with one of the subject being a Ghanaian citizen.

North-west zone had 138 subjects (55.2%), North-central had 58 subjects (23.2%), South-east had 22 subjects (8.8%), South west had 10 subjects (4%). Others were South-South with 13 subjects (5.2%) and North-east with 8 subjects constituting 3.2% of the participants. There were 96 male (38.4%) and 154 female (61.6%) who participated in the study.

One hundred and twenty-five subjects (50%) were married as compared with 85 (34%) who were single, 26 (10.4%) widow and widowers 8 (3.2%) separated from their spouses while 6 (2.4%) were divorced. The age range of the subjects was 18 to 64 years, with the mean of 35.58 (SD + 8.8). One hundred and seventy-two (68.8%) subjects were between the age of 18 to 39 years while 78 (31.2%) were between 40 to 64 years of age. One hundred and twenty-six (90%) subjects were Christians while 24 (9.6) were Muslims. One hundred and thirty-seven subjects (54.8%) had secondary education, 63 (25.5%) had tertiary education, and 49 (19.6%) had primary education while one had Islamic education. In terms of occupation, 126 (50.4%) of the participants were employed while 105 (42%) were unemployed. 19 (7.6%) were students.

Clinical status of the participants

Table 2 shows the clinical characteristics of the subjects. On clinical examination of the patients, two hundred and seventeen (86.8%) of them were found to be physically health while 33 (13.2%) were found to be physically ill. Using the WHO (2003) classification of HIV/AIDS disease (World Health Organization, 2003), one hundred and seventy-nine (71.6%) were grouped into stage 1, 39 (15.6%) were grouped into stage 2, 22 (8.8%) were grouped into stage 3 while 10(4%) were grouped into stage 4 of HIV/AIDS clinical stages. The patients were also divided into four groups using CD4 cell counts. Nine (3.6%) of them had CD4 counts less than 100, 103 (41.2%) had CD4 between 100 and 299 and 80 (32%) had CD4 between 300 and 499, while 58 (23.2%) had CD4 cell count of 500 u/ml and above. Therefore 193 (77.2%) subjects had CD4 cell count below 500 u/ml while the remaining 58 (23.2%) of the subjects had counts of 500 u/ml and above.

On the duration of illness, 43 (17%) of the subjects had diagnosis of seropositivity of less than 1 year duration, 148 (59.2%) had the diagnosis 1 to 3 years ago, 51 (20.4%) subjects were diagnosed 3 to 5 years ago while 8 (3.2%) subjects were diagnosed more than 5 years ago. Fifty (20%) of the subjects started antiretroviral medication less than 1 year before the study, 146 (56.8%) subjects commenced their medication 1 to 3 years before the study. 40 (16%) started medication 3 to 5 years while only 2 (0.8%) started antiretroviral medication more than 5 years before the study. Sixteen (6.4%) had not started taking medication as at the time of the study.

Table 1. Socio-demographic of the respondents.

S/N	Sociodemographic variable	Frequency (n=250)	Percentage
Sex			
1	Male	96	38.4
	Female	154	61.6
Age			
2	18-39	172	68.8
	40-64	78	31.2
Religion			
3	Islam	24	9.6
	Christianity	226	90.4
Marital status			
4	Single	85	34
	Married	125	50
	Divorced	6	2.4
	Separated	8	3.2
	Widow	26	10.4
Geopolitical zone			
5	Northwest	138	55.2
	North central	58	23.2
	Northeast	8	3.2
	Southeast	22	8.8
	South-south	13	5.2
	Southwest	10	4.0
	Ghana	1	0.4
Education			
6	Islamic	1	0.4
	Primary	49	19.6
	Secondary	137	54.8
	Tertiary	63	25.2
Employment			
7	Employed	162	50.4
	Unemployed	105	42
	Student	19	7.6
Living with			
8	Alone	24	9.6
	Spouse	109	43.6
	Parents	47	18.6
	Children	46	18.4
	Relative	22	8.8
	Others	2	0.8

Psychosomatic characteristics

Table 3 shows the psychosomatic characteristics of the

respondents. Sixty-seven (26.8%) of the participants had a score of 18 and above on the Beck depression inventory (BDI) used in screening for depression. These

Table 2. Clinical status of the respondents.

S/N	Clinical variables	Frequency (n=250)	Percentage
State of health			
1	Asymptomatic(Physically healthy)	217	86.8
	Symptomatic(Physically ill)	33	13.2
CD4 cell count			
2	<100	9	3.6
	100 – 299	103	41.2
	300 – 499	80	32.0
	>500	58	23.2
Duration of HIV infection			
3	<1yr	43	17.2
	1-3yrs	148	59.2
	3-5yrs	51	20.4
	>5yrs	8	3.2

Table 3. Psychosomatic characteristics of the respondents.

S/N	Psychosomatic variables	frequency	Percentage
Depression			
1	Depressed	65	26.0
	Non- depressed	185	74.0
Severity of depression			
2	Mild	28	43
	Moderate	24	37
	Severe	13	20
Past psychiatric hiistory			
3	Yes	13	5.2
	No	237	94.8
Previous suicide attempt			
4	Yes	12	4.8
	No	238	95.2
Reaction to illness			
5	Good	170	68.0
	Fair	66	26.4
	Poor	14	5.6

67 subjects were further interviewed using the major depressive disorder module of MINI. Sixty-five (26%) of the subjects were diagnosed to have major depressive disorder. Twenty-eight (43%) had mild depressive disorder, 24 (37%) had moderate depressive disorder while 13 (20%) had severe depressive disorder.

Out of the 250 subjects that participated in the study, 13 (5.2%) had previous psychiatric history as compared with 237 (94.8%) with no history of psychiatric illness. Twelve (4.8%) of the subjects reported that they have attempted suicide during the course of their illness while 238 (95.2%) had no history of previous suicide attempt.

Table 4. Suicidal behavior and socio-demographic characteristics of the subjects.

S/N	Socio-demographic variables	Suicidality (%)		dF	X ²	P
		Non-suicidal	Suicidal			
1	Age					
	18-39	144(83.8)	28(16.2)	1	0.032	0.850
40-64	66(84.6)	12(15.4)				
2	Sex					
	Male	83(86.5)	13(13.5)	1	0.701	0.400
Female	127(82.5)	27(17.5)				
3	Marital status					
	Married	109(87.2)	16(12.8)	4	5.930	0.200
	Single	69(81.2)	16(18.8)			
	Separated	5(62.5)	3(37.5)			
	Widow/widower	23(88.5)	3(11.5)			
Divorced	4(66.7)	2(33.3)				
4	Religion					
	Islam	18(75)	6(25)	1	1.600	0.200
Christianity	192(85)	34(15)				
5	Education					
	Islamic	1(100)	–	3	6.981	0.073
	Primary	46(93.9)	3(6.1)			
	Secondary	108 (78.8)	29(21.2)			
Tertiary	55(87.3)	8(12.7)				
6	Occupation					
	Unemployed	83(79)	22(21)	2	3.360	0.186
	Employed	110(87.3)	16(12.7)			
Student	17(89.5)	2(10.5)				
7	Living with					
	Alone	19(79.2)	5(20.8)	5	298.000	0.702
	Spouse	92 (84.4)	17(15.6)			
	Children	39(84.8)	7(15.2)			
	Parents	39(83)	8(17)			
	Relatives	20(91)	2(9)			
Others	1(50)	1(50)				

One hundred and seventy (68%) of the subjects revealed that reaction to their illness by friends, family, colleagues and other people were good, 66 (26.4%) said the reaction was fair while 14 (5.6%) believed the reaction to their illness was poor (Tables 4 to 6).

DISCUSSION

The age range of the subjects was 18 to 64 years, with mean of 35.58 years (sd = 8.8). Similar age distribution

was found in a study conducted by Iliyasu et al (2004) which also reported a mean age of 33.7 (sd = 8) among HIV positive patients.

Majority of the respondents were physically healthy while one tenth subjects were found to be physically ill at the time of the study. This is inconsistent with Olley et al. (2005) report which revealed that 75 (50.3%) subjects were asymptomatic while 74 (49.7%) subjects were symptomatic. Sale and Gadanya (2007) revealed that one third of his subjects were asymptomatic compared with two-third that were symptomatic at the time of his

Table 5. Suicide behaviour and clinical status of the patients.

S/N	Clinical variables	Suicidality (%)		dF	X ²	P
		Non-Suicidal	Suicidal			
Physical						
1	Asymptomatic(Healthy)	187(86.2)	30(13.8)	1	5.787	0.016
	Symptomatic (Ill)	23(69.7)	10(30.3)			
CD4 cell count (u/ml)						
2	<500	160(83.4)	32(16.6)	1	0.212	0.640
	500 & more(> 500)	49(86)	8(14)			
Duration of HIV infection						
3	<1yr	34(82.4)	9(17.6)	3	2.633	0.756
	1-3yrs	127(85.8)	21(14.2)			
	3-5yrs	42(82.4)	9(17.6)			
	>5yrs	7(87.5)	1(12.5)			
Duration of ARV treatment						
4	<1yr	38(76%)	12(24%)	4	4.758	0.575
	1-3yrs	121(85.2%)	21(14.8%)			
	3-5yrs	34(85%)	6(15%)			
	>5yrs	2(100%)	0			
	Yet to start Rx	15(93.8%)	1(6.2%)			

Table 6. Suicide behavior and psychosomatic characteristics of the respondents.

S/N	Psychological variables	Suicidality (%)		dF	X ²	P
		Non-Suicidal	Suicidal			
Depression						
1	Depressed	39(60)	26(40)	1	37.645	0.000
	Not depressed	171(92.4)	14(7.6)			
Past psych. Hx						
2	Yes	8(37.5)	5(62.5)	1	1.000	0.023
	No	202(85.2)	35(14.8)			
Past suicide attempt						
3	Yes	0	12(100)	1	66.170	0.000
	No	210 (88.3)	28(11.7)			
Reaction of others to HIV infection						
4	Poor	5(35.8)	9(64.2)	2	26.500	0.000
	Fair	55(83.4)	11(16.6)			
	Good	150(88.2)	20(11.8)			

study. Wakawa (2009) also reported that 282 (93%) subjects were symptomatic as compared with 21 (7%) that were asymptomatic at the time of his study. Duration of illness and the time of carrying out the examination may have accounted for the difference. For example,

Olley et al. (2005) carried out their study among recently diagnosed HIV positive subjects. Another possible reason for the differences was that 93% of the respondents in this study were on medication and this might have been responsible for the physically healthy condition of the

subjects. About 3/4 subjects had cell counts less than 500 u/ml while 1/4 subjects had CD4 cell count of 500 u/ml and above at the time of the study. The mean CD4 cell count in this study was 362 u/ml. Wakawa (2009) reported that 250 (83.2%) out of the 303 subjects studied had CD4 less than 399 u/ml while 51 (16.8%) had CD4 of 400 and above. Olley et al (2005) reported mean CD4 of 315.71 u/ml while Sale and Gadanya (2007) reported mean of 306 u/ml at the time of his study. CD4 cell counts being immunological status of the subject are said to correlate with the physical state of the patient. The possible explanation for the differences among the various studies quoted above may be accounted for by variation of the cell count at different stages of the illness. Improvement in clinical state of the subject secondary to different interventional measures such as antiretroviral therapy may have also accounted for the differences.

About 60% of the subjects had diagnosis of HIV seropositivity between 1 to 3 years, 17.2% subjects had diagnosis less than 1 year, one-fifth of the subjects had diagnosis 3 to 5 years while 3.2% had diagnosis 5 years and above. This is similar to Wakawa (2009) study that reported 70% of subjects used in his study to have had diagnosis between 1 to 3 years. One in five of the subjects commenced antiretroviral medication less than 1 year from the time of the study while majority (56.8%) commenced medication between 1 to 3 years. Only 2 subjects commenced medication 5 years and above while 16.4% were yet to commence antiretroviral medication. Commencement of antiretroviral medication depends on immunological and physical state of the patients. Hence subject variation between duration of illness and duration of drug medication may account for the difference noted above.

Psychosomatic variables

The prevalence of depressive disorder in this study was 26%. This finding is similar to that of Bolton et al. (2004) in south west Uganda who reported 21% prevalence of depressive disorder among HIV positive patients. This finding is also similar to the prevalence of 29.3% reported by Chikezie (2009). However it is different from that of Audu et al. (2008) and Sale and Gadanya (2007) which reported 36.2 and 34.8%, respectively. The retrospective nature and fewer patients used by Audu et al. (2008) may have accounted for the increased prevalence found in their study. Sale and Gadanya (2007) reported that two-third of the subjects were symptomatic as at the time of their study and it has also been reported (Wakawa, 2009) that onset and deterioration of physical health can predispose to the development of depressive disorder and suicide behaviour. Hence the increased prevalence of depressive disorder among HIV/AIDS patients reported by Sale and Gadanya (2007) may be explained on this basis. Olley (2005) also reported a much higher

prevalence of 38.7% of depressive disorder in a study in South Africa. Environmental, cultural and social factors as negative psychosocial stressors may have contributed to the increased prevalence of depressive disorder reported among HIV positive patients in their study. One in 20 subjects reported to have had past history of psychiatric illness. Two of the subjects reported depressive illness, 1 reported psychosis and 10 could not classify their psychiatric illness. This finding is similar to Sale and Gadanya (2007) and Wakawa (2009) reports that revealed 9 (3.6%) and 18 (5.9%) subjects with previous psychiatric illness, respectively.

One hundred and seventy subjects (68%) reported that reaction to their illness by friends, family and relations were good, 66 (26.4%) felt the reaction was fair while one in twenty of the subjects revealed that reaction to their illness was poor. This is not consistent with Sale and Gadanya (2007) report that revealed no social support from 75 (30%) subjects. The difference may be attributed to different perception of the disease by different people. Reaction to illness by friends, relation and colleagues was found to be significantly associated with suicidality in this study. 9 (64.2%) suicidal subjects reported that reaction to their illness was poor, 11 (16.6%) reported reaction to their illness has been fair whereas 20 (11.8%) reported the reaction was good ($\chi^2 = 62.5$, $p = 0.000$, $df = 2$). Possible reason for this association may be explained on the basis of the negative reactions leading to stigmatization with consequent suicidal behaviour, whereas good reaction may increase social support that reduces tendency to suicidality.

Predictors of suicidality

The gender of the subjects was not found to be statistically significant in this study when comparing the rates of suicidality. This finding is consistent with Olley et al. (2005) and Kelly et al. (1998) whose reports also revealed no statistical difference among the two genders. There was also no statistical association found between the different age groups and suicidality. This is consistent with the report of Kelly et al. (1998). However, the finding was inconsistent with Olley et al. (2005) which reported significant association of younger age groups (mean of 25.84 years, $SD = 5.85$) with suicidality. The possible explanation for none significant association in this study may be the availability of medication and the knowledge that HIV positive patients can be managed and also give birth successfully without transferring the infection to their children. This can be achieved through a continuous care during and after pregnancy thereby reducing risk of mortality among the infants of the infected patients. Reaction to illness by friends, colleagues and relatives was however found to be statistically significant in this study ($\chi^2 = 26.5$, $p = 0.000$, $df = 2$). 64.2% of the subjects that reported reaction to their illness as being poor were

suicidal as compared with 20 (28.6%) that reported the reaction to their illness as being good. Negative reactions to illness by friends, colleagues and relations may impair adequate social support which may consequently predispose to emotional disorder and suicidal behaviour whereas good reaction may lead to social support that protect against suicidal behaviour. One in three subjects of those that were physically ill had suicidal behaviour as compared with 13.8% of subjects that were physically healthy. There was a significant association between physical state and suicidality. This finding is similar to the report of Kelly et al. (1998). However it contrasts with Olley et al. (2005) who reported no significant association between physical state and suicidality. The possible explanation for the association may be because, physically healthy HIV positive patients are likely to function optimally when compare with physically compromised HIV patients who may not. They are also likely to face less discrimination and stigmatization. There was no significant statistical difference between CD4 cell groupings and Suicidality ($\chi^2 = 0.212$, $p = 0.64$, $df = 1$). This finding is consistent with Olley et al. (2005) that also reported no significant association between CD4 and CD8 cell counts and suicidality. The possible explanation for the lack of significant association may be the varying level of cell counts at different stages of the illness. The stages of the illness, rather than the actual CD4 cell counts might be more important in determining suicide behaviour.

Duration of HIV illness and antiretroviral drug therapy were also not found to be significantly associated with suicidality in this study. The possible reason for this finding may be earlier psychological adjustment to the illness as well as the availability and free provision of antiretroviral medications. Depression was found to be significantly associated with suicidality in this study ($\chi^2 = 37.645$, $p = 0.000$, $df = 1$). The degree of depression was also found to be significantly associated with the rate of Suicidality ($\chi^2 = 1.011$ $p = 0.000$, $df = 8$).

These findings are consistent with many other studies of suicidality among HIV positive patients (Kelly et al., 1998; Olley, 2007). The explanation is that depression reduces quality of life of patients, which may subsequently lead to hopelessness and suicidal behavior. Depression has also been reported to be a strong risk factor in the etiology of suicide and deliberate self-harm (Lewis, 1934). Previous suicidal attempt was also found to be significantly associated with suicidality in this study ($\chi^2 = 66.17$, $p = 0.000$, $df = 1$). This finding is consistent with Kelly et al. (1998) who also reported significant association in their study. Previous suicidal attempt can predispose to another suicidal behaviour as it is reported to be a risk factor for another episode of suicidal behavior (Gould et al., 1996). About one-third of subjects among those that with previous psychiatric history had suicidality as compared with 14.8% subjects without previous psychiatric history. The difference between these two

groups was statistically significant ($\chi^2 = 1$, $p = 0.023$, $df = 1$). This finding is consistent with the findings of Olley et al. (2005).

An explanation for this association may be the increased risk of suicidality reported for those with past psychiatric illness. The five factors that were significantly associated with suicidality namely depression, reaction to illness, physical state, previous suicidal attempt and past psychiatric illness were all entered into multiple logistic regression analysis. Only depression ($p = 0.000$; odd ratio = 11.242 and 95% CI = 4.147 to 30.478) and reaction to illness by friends, colleagues and relatives ($p = 0.032$; odd ration = 0.193 and 95% CI = 0.043 to 0.866) were found to be significant predictors of suicidality in this study.

Conclusion

The prevalence of suicidality in this study was 16%. Depressive disorder had a prevalence of 26%. Thirty-one (77.5%) Suicidal subjects had low to moderate risk while 9 (22.5%) had high suicidal risk. The subjects' state of origin spread across the 6 geo-political zones of Nigeria with one Ghanian citizen. Five independent factors were found to be significantly associated with suicidality viz: depression, reaction to illness, physical state, past psychiatric illness and previous suicidal attempt. However, only depression and reaction to illness by friends, relatives and colleagues were found to be significant predictors of suicidality among these subjects. Also, the more severe the depressive disorder, the higher the risk of suicide behaviour in this study. All the subjects found to have depressive disorder and suicidality were referred to the nearest psychiatric facility for further review and management.

Conflict of Interests

The authors have not declared any conflict of interests.

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Full Length Research Paper

Barriers to the practice of exclusive breastfeeding among HIV-positive mothers in sub-Saharan Africa: A scoping review of counselling, socioeconomic and cultural factors

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Received 24 September, 2015; Accepted 29 February, 2016

The World Health Organization (WHO) recommends exclusive breast-feeding (EBF) for HIV exposed infants for six months; this is considered best practice for reducing mother-to-child transmission of HIV in the postpartum period. This is a scoping review of the barriers affecting women's decision-making and choice to sustain the practice of EBF in sub-Saharan Africa (SSA). An online literature search via PubMed, Science Direct, Google Scholar, WHO and Joint United Nations Programme on HIV and AIDS (UNAIDS) websites identified research studies and reports that explored socio-economic, cultural and infant feeding counselling-related barriers to EBF among HIV-positive mothers in SSA. A total of 341 relevant articles were identified only 35 (23 qualitative, 3 quantitative and 9 mixed methods) met the inclusion criteria. Findings reveal that key barriers to choice and sustained practice of EBF are healthcare workers' personal biases, inadequate counselling skills and guideline knowledge, a culture of mixed feeding norms, and maternal lack of decision-making power and fear of vertical transmission. Transmission of HIV programs in countries where major challenges persist should evaluate and address the identified healthcare worker and community-level factors impeding EBF.

Key words: Africa South of the Sahara, breastfeeding, counselling, cultural norms, socioeconomic, HIV seropositivity, mothers.

INTRODUCTION

In 2014, an estimated 190,000 children were newly-infected with HIV in sub-Saharan Africa (SSA) (USAID, 2015). Mother-to-Child Transmission of HIV (MTCT) occurs during pregnancy, delivery, or post-delivery via

breastfeeding. In the absence of anti-retroviral therapy (ART), prolonged breast-feeding up to 24 months has an estimated 10-16% risk of postnatal transmission (Miotti et al., 1999; Nduati et al., 2000; Berhan et al., 2014). The

World Health Organization (WHO) defines mixed feeding as “breastfeeding with the addition of fluids, solid foods and/or non-human milks such as formula” (WHO, 2008) (Table 1). Mixed feeding is considered responsible for 28 to 50% of HIV infections in children (WHO, 2008; Rollins et al., 2012; USAID, 2013), and is the most common mode of MTCT of HIV in breastfeeding populations (Coutsoudis et al., 2004). Whilst mixed feeding is associated with the highest risk of MTCT (Coovadia et al., 2007; Kuhn et al., 2007), Exclusive Formula Feeding (EFF) still carries the highest risk of infant mortality in low- resource settings (Coovadia et al., 2007; Kagaayi et al., 2008).

Exclusive Breast Feeding (EBF) has the lowest risk of MTCT (Coovadia et al., 2007; Natchu et al., 2012), and is important for the survival of both HIV-exposed and HIV-unexposed infants (Kagaayi et al., 2008; Mwiru et al., 2011; Natchu et al., 2012). The WHO recommend EBF for HIV-exposed infants in low-resource settings for 6 months; and that EBF be combined with complementary feeding from age 6 to 12 months (WHO, 2006; 2010; 2013). These infant feeding recommendations should be practiced in conjunction with maternal ART, whether for infant prophylaxis only or for lifelong maternal treatment.

Although breastfeeding is the usual infant feeding practice across SSA, EBF however is not necessarily the norm and makes adherence to the practice difficult for HIV-positive mothers (Musa, 2011; Chinkonde et al., 2012). Women in SSA breastfeed their infants for an average of 14 to 19 months, but only 30% to 46% of them practice EBF for the first 6 months postpartum (Bbaale, 2014; Traore et al., 2014; Kimani-Murage et al., 2015). In order to promote infant feeding practices that will significantly reduce MTCT, Prevention of Mother-to-Child Transmission of HIV (PMTCT) programs have to transcend simply informing mothers about feeding practices and documenting their choices. These programs will need to accommodate the socio-economic and cultural contexts within which infant feeding decisions are made and practiced. Previous reviews on HIV and infant feeding in SSA have explored associations between breastfeeding and postnatal transmission, and the benefits of EBF versus the health hazards of EFF in low- resource settings (Musa, 2011; Seth, 2012). However only 3 reviews expanded their scope to include social determinants affecting infant feeding practices (Laar et al., 2013; Lazarus et al., 2013; Tuthill et al., 2014). The first review was limited only to South Africa (Lazarus et al., 2013), while the other 2 were systematic reviews conducted with respect to SSA (Laar et al., 2013; Tuthill et al., 2014). In this scoping review, an expanded examination of socioeconomic, cultural and infant feeding counselling-related barriers to the WHO –

recommended EBF was performed. This includes data from the period between the release of the first WHO guidelines on infant feeding (WHO, 2000) and after the consolidated WHO guidelines (WHO, 2015).

METHODOLOGY

This paper is based on an in-depth review of peer-reviewed publications and reports from key international organisations. The review covers the period October 1, 2000 to July 31, 2015. Relevant publications on infant feeding practices and HIV from the websites of the WHO and Joint United Nations Programme on HIV and AIDS (UNAIDS) were included. The literature search was carried out in PubMed, Science Direct and Google scholar. Search key words/terms were as follows: *HIV and exclusive breast feeding; exclusive breastfeeding and cultural factors and HIV and sub-Saharan Africa; healthcare workers and HIV infant feeding; exclusive breastfeeding and cultural factors and HIV and sub-Saharan Africa; infant feeding and socio economic factors and HIV and sub-Saharan Africa; socio economic factors and breastfeeding and HIV; healthcare workers and breastfeeding and HIV*. A total of 341 articles were identified (Figure 1).

Inclusion criteria

Titles of articles were included if the study was conducted in SSA, published between October 1, 2000 and July 31, 2015, and had clearly stated objectives and research methodology. Studies included had at least one, or a combination of the following study participants: Healthcare Workers (HCWs) providing infant feeding counselling in PMTCT programs, HIV-positive mothers, HIV-positive pregnant women, mothers of unknown HIV status, HIV-positive men, men of unknown HIV status, male partners of HIV-positive women or women of unknown HIV status, and family members of unknown HIV status. Retrieved references were imported into a reference manager, and duplicates were excluded. Only literature published in English were included.

Exclusion criteria

Articles were excluded from the selection if they were duplicates, review papers, irrelevant to the study topic or objectives, conducted outside SSA, or published outside the study period. No studies were excluded based on quality; however, limitations of the included studies and of the review findings are highlighted in the discussion section. This paper reviewed existing literature and did not require ethical approval.

RESULTS

Thirty-five (35) articles, comprising 3 quantitative, 23 qualitative and 9 mixed methods met inclusion criteria (Figure 1). Findings were categorized into five major themes: Infant Feeding Guidelines and Counselling Content, Cultural Norms, Socioeconomic Vulnerability,

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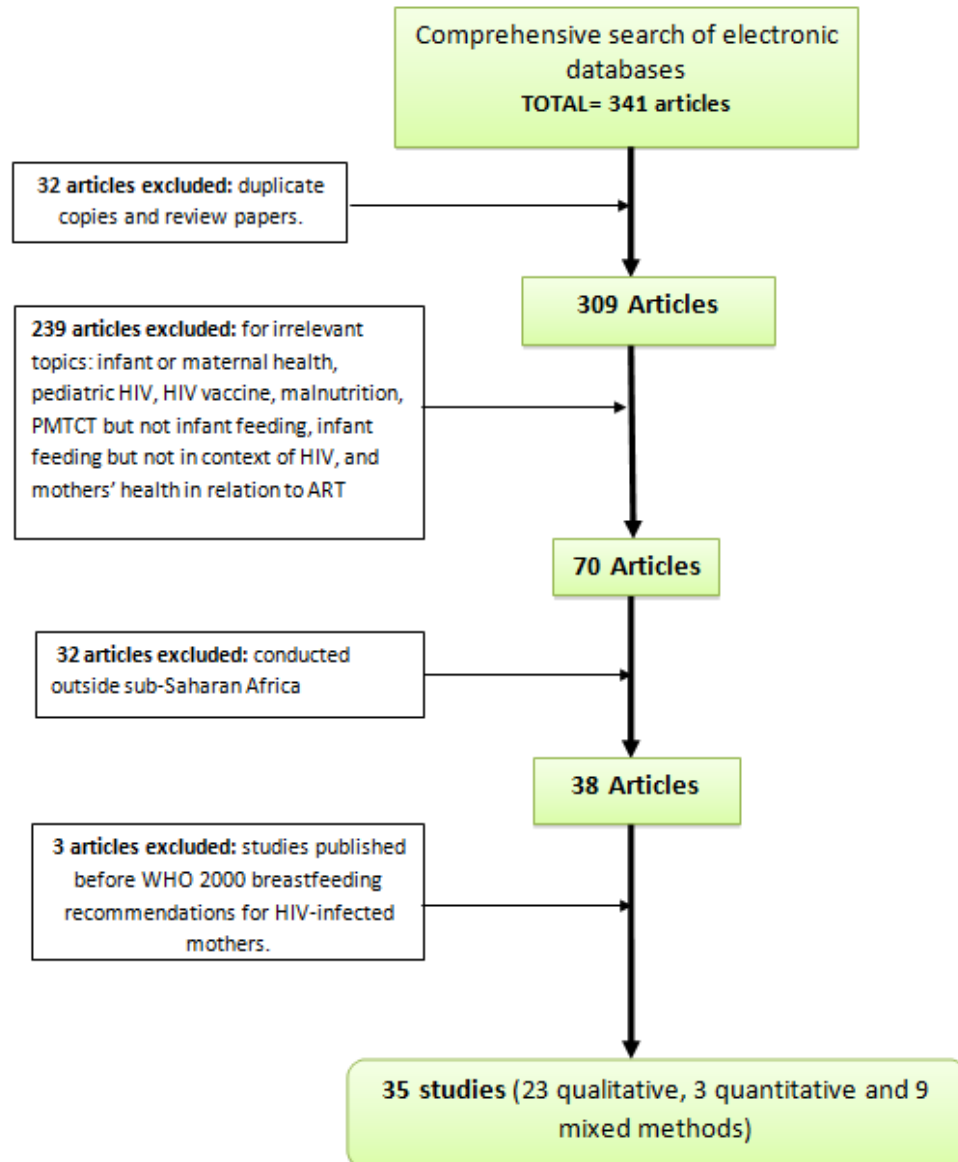


Figure 1. Article Selection Process

Maternal Health, and Maternal Knowledge of Infant Feeding.

Theme 1: Infant feeding guidelines and counselling content

The first WHO guidelines on the use of ARVs in pregnancy and on infant feeding were released in 2000 (WHO, 2000). Major changes with respect to infant feeding in the subsequent WHO guidelines of 2006 and 2010 reflect successive updates based on scientific evidence on HIV and infant feeding (WHO, 2007, 2010). These infant feeding recommendations have not changed

since 2010; though new HIV management guidelines have been developed in 2013 (WHO, 2010, 2013, 2015). In the 2000 guidelines, EBF was recommended within the first few months postpartum (number of months not specified), followed by “abrupt weaning” (WHO, 2007). In both the 2000 and 2006 guidelines the conditions necessary for the practice of EFF were referred to as ‘Acceptable’, Feasible, ‘Affordable’, “Sustainable” and ‘Safe’ (AFASS), but the terms not clearly defined (WHO, 2007, 2010). The 2010 guidelines made the “AFASS” criteria clear by defining them in terms of family support, sufficient formula supply, hygienic preparation, and access to safe water and healthcare services. The 2010 guidelines also de-emphasized AFASS, and touted EBF

as the single best infant feeding option for low-resource settings (WHO, 2010). While appropriate, the significantly changing content at relatively short intervals between WHO guidelines afforded little time for country-wide implementation in resource-limited SSA countries. This included time for changing the previous guideline practices and updating training for health workers. Since the scientific rationale behind these updates are often not eloquently explained to HCWs during training (Shayo et al., 2014), some HCWs were reluctant to change counselling messages either because they did not feel comfortable with the new guidelines or were concerned about losing the women's trust (Chinkonde et al., 2010; Koricho et al., 2010).

Content of healthcare worker-provided infant feeding counselling

Studies have shown that HCWs are likely to give adapted messages based on what they believe to be the best feeding choice for mothers (Tijou- Traore et al., 2009; Wachira et al., 2009; Madiba et al., 2013). For example, some studies have found that EFF was suggested for women of high socio-economic status while EBF was recommended for mothers of low socio-economic status (Koricho et al., 2010; Chinkonde et al., 2012). Research in South Africa and Tanzania also highlight that HCWs were concerned that EBF would be challenging for women they perceived as undernourished (Buskens et al., 2007; Leshabari et al., 2007). Furthermore, in Uganda and Tanzania, HCWs did not advocate EBF for 6 months since they believed the practice was unfeasible for many women who would be leaving their infants at home with caregivers when they resumed work in early postpartum (Leshabari et al., 2006, 2007; Fadnes et al., 2010). Additionally, in Tanzania and Kenya, HCWs advised mothers to practice EBF for only the first 2-3 months postpartum believing that such instructions would keep mothers away from practicing mixed feeding (Leshabari et al., 2006; Wachira et al., 2009). In Ethiopia and Tanzania, HCWs encouraged mothers to choose EFF to prevent MTCT (Koricho et al., 2010).

Message delivery style: Counselling versus instruction on infant feeding

The norm in most developing country healthcare settings is for HCWs to give instructional advice to women, therefore counselling is perceived as a new and challenging concept for both mothers and HCWs (Leshabari et al., 2007). In addition, counselling requires specialised skills and more time for HCW-mother interaction that is difficult to accommodate in healthcare centres that are often understaffed (Chopra et al., 2009; Chinkonde et al., 2010; Fadnes et al., 2010). A number of studies have found that HCWs in Tanzania, Zambia,

Cameroon and Burkina Faso, recommended or simply instructed mothers to practice EFF (Fadnes et al., 2009; Tijou-Traore et al., 2009; Chisenga et al., 2011). A study in Kenya, Malawi and Zambia found that HCW training on infant feeding in PMTCT was biased against breastfeeding (Chopra et al., 2009). Furthermore, insufficient training of HCWs and a lack of reference materials lead to suboptimal delivery of infant feeding counselling with non-standardized messages (Chinkonde et al., 2010; Fadnes et al., 2010).

Mixed messages on infant feeding

Infant feeding guidelines are often complicated for HCWs to understand, so it is expected to be even more confusing for laywomen who may have little formal education. For example, HIV-positive women were informed that breastfeeding is a mode of MTCT, while EBF is a means of prevention, without a clear explanation on the exact risk of transmission through breastfeeding with and without ARVs (Tijou-Traore et al., 2009; Fadnes et al., 2010; Ostergaard et al., 2010). In South Africa, HIV-positive mothers believed breastfeeding and formula feeding could complement one another after observing posters illustrating both breastfeeding and bottle-feeding within the same hospital (Doherty et al., 2006a). In addition, the timing for infant feeding counselling should be considered carefully and not given for example at the time of a new HIV diagnosis (Doherty et al., 2006a; Leshabari et al., 2006). Furthermore, mothers may receive inconsistent information or advice on infant feeding practices from various HCWs in different departments within the same health facility (Doherty et al., 2006a; Chisenga et al., 2011; Chinkonde et al., 2012; Madiba et al., 2013).

Healthcare workers' influence on mothers' choice of infant feeding

Counselling sessions with HCWs are recognised as the primary platforms for mothers to obtain HIV-related information and infant feeding recommendations (Doherty et al., 2006a; Maman et al., 2012). Therefore, HCWs can have a significant influence on mothers' initial feeding choice and practice (Chisenga et al., 2011; Kafulafula et al., 2014). However, studies have found that a significant number of HCWs, including those with relevant training, presented the possibility of MTCT through breastfeeding as a certainty and not a risk, resulting in infant feeding counselling that downplayed EBF (Buskens et al., 2007; Chopra et al., 2009; Kafulafula et al., 2014). The overestimation of breastfeeding-related postnatal MTCT risk by HCWs in several SSA countries either discouraged mothers from practicing EBF, or encouraged them to switch from EBF to EFF in the early postpartum period (Doherty et al., 2006b; Koricho et al., 2010;

Table 1. Definitions of infant feeding methods according to the WHO^a.

Feeding method	WHO definition
Exclusive breast feeding (EBF)	Means an infant receives no other food or drink, not even water, other than breast milk (which can include expressed breast milk), with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.
Exclusive formula feeding (EFF)	Involves the use of commercial infant formula that is formulated industrially in accordance with applicable Codex Alimentarius standards to satisfy the nutritional requirements of infants during the first months of life up to the introduction of complementary foods.
Mixed feeding	Refers to breastfeeding with the addition of fluids, solid foods and/or non-human milks such as formula.

Reproduced from WHO 2008 HIV Transmission through Breastfeeding: A Review of Available Evidence 2007 Update.

Maman et al., 2012). In Tanzania, except for HCWs that had prior training in HIV and infant feeding policy, all counsellors were in favor of EFF for HIV-exposed infants (Leshabari et al., 2007). Poor-quality infant feeding counselling could result in inappropriate feeding choices among mothers leading to a significantly increased risk of postnatal transmission and infant mortality (Doherty et al., 2007).

Theme 2: Cultural norms

Mixed feeding and influence from family members

A woman's informed choice is not the only factor for successful infant feeding practice in SSA, as male partners and other family members will often weigh in with their own views on what is acceptable or not (Tijou-Traore et al., 2009; Cames et al., 2010; Marembo et al., 2014). A majority of women choose EBF over EFF because of the culturally acceptable norm of breastfeeding, and for mother-infant bonding (Buskens et al., 2007; Hofmann et al., 2009). Nonetheless, adhering to EBF is challenging for many women. Although breastfeeding is a highly valued practice, mixed feeding (see definitions in Table 1), is the norm in most of SSA (Tijou-Traore et al., 2009; Chinkonde et al., 2010; Fadnes et al., 2010). It is therefore not surprising to find that women are often strongly encouraged and even pressurised by family members to follow this practice (Koricho et al., 2010; Madiba et al., 2013; Mataya et al., 2013). In South Africa, 80% of mothers practicing EBF resorted to mixed feeding within the first month postpartum as a consequence of family pressure (Doherty et al., 2006a). Likewise, in Cameroon and Burkina Faso, social pressure made women who initiated EBF, resort to mixed feeding early postpartum (Desclaux et al., 2009). Similarly in Nigeria, pressure from family members accounted for mixed feeding among 43% of 42 women surveyed (Lawani et al., 2014).

Social pressure to mix-feed may extend beyond family.

In Zambia, Chisenga et al. (2011) reported that out of 20 HIV-positive mothers interviewed, 6 (a third) admitted that relatives and neighbors influenced their feeding practices with suggestions that were in contradiction to recommendations from health facilities. Ultimately, mothers who were able to adhere to EBF despite societal pressures either did not fully disclose their EBF practice or developed plausible explanations for not practicing mixed feeding (Tijou-Traore et al., 2009; Madiba et al., 2013; Mataya et al., 2013).

Influence of grandmothers and other matriarchs

Grandmothers and other matriarchs have a strong influence on infant feeding in SSA (Buskens et al., 2007; Cames et al., 2010). Unfortunately, matriarchal advice on mixed feeding is usually given without the awareness of HIV infection and the risk of MTCT (Hofmann et al., 2009; Maru et al., 2009). As such, women living with their mothers or mothers-in-law are more likely to mix feed (Doherty et al., 2006a; Falnes et al., 2011). Factors that help mothers resist mixed feeding advice include disclosing HIV status to partners and mothers-in-law, attending peer support groups, and living in urban areas away from matriarchs (Ostergaard et al., 2010; Falnes et al., 2011; Mataya et al., 2013;).

Mother-infant separation and other cultural beliefs

In situations where individuals other than mothers care for infants, feeding tends to include cow's milk, formula milk or traditionally-prepared liquids (Burke, 2004; Doherty et al., 2006b; Webb-Girard et al., 2012). In Malawi, it was assumed that the infant's consumption of a traditional concoction (kachasu) would kill the HIV virus and render mixed feeding a safe practice (Mataya et al., 2013). In South Africa and Malawi, mother-infant separation for a substantial amount of time during the day was believed to make breast milk poisonous and

unfit for infant consumption (Buskens et al., 2007; Mataya et al., 2013). Thus to prevent the child from falling “ill,” breastfeeding was either suspended until the following morning or the “poisonous” milk had to be expelled from the breast first (Buskens et al., 2007; Mataya et al., 2013).

Theme 3: Socioeconomic vulnerability

Effect of financial dependence

A number of studies have found that women who were financially dependent on a family member were more likely to practice mixed feeding (Desclaux et al., 2009; Cames et al., 2010). Other studies have in the same light reported that women who were financially independent, living within a nuclear family setting or supported by an HIV-positive partner were more likely to exclusively breastfeed (Doherty et al., 2006b; Desclaux et al., 2009; Ostergaard et al., 2010; Mataya et al., 2013).

Effect of non-disclosure of HIV status

Financial vulnerability can result in nondisclosure of HIV status due to fear of stigma and losing social and/or financial support (Hofmann et al., 2009; Fadnes et al., 2010). In a setting of non-disclosure, the practice of EBF would be a greater challenge and perhaps non-negotiable (Ostergaard et al., 2010). This is even more challenging in societies where EBF is known to be a recommended feeding practice for HIV-positive mothers (Thairu et al., 2005; Buskens et al., 2007). Conversely, HIV status disclosure to a partner and/or family members gave women the needed support to practice EBF, whilst non-disclosure was associated with the practice of mixed feeding within 6 months postpartum (Fadnes et al., 2010; Marembo et al., 2014; Onono et al., 2014).

Theme 4: Maternal health

Maternal health, food insecurity and insufficient breast milk syndrome

A number of studies suggest that women may resort to mixed feeding when they have concerns about insufficient breast milk, or if they perceive practicing EBF to be detrimental to their own health (Kimani-Murage et al., 2011; Ostergaard et al., 2010; Webb-Girard et al., 2012). Women who were food secure were more confident in their breast milk production, and were more likely to adhere to EBF than food-insecure women (Ostergaard et al., 2010; Webb-Girard et al., 2012; Mataya et al., 2013). In Malawi, some women believed practicing EBF would improve their own feeding

and health status, while other women believed EBF would be detrimental to an HIV-positive mothers' health (Kafulafula et al., 2014). In Nigeria, participants in one study believed that HIV-positive mothers might be too ill to breastfeed exclusively (Abiona et al., 2006). Studies from South Africa, Malawi and Kenya, also suggest that many women will practice mixed feeding with solids or semi-solid foods because they do not consider breast milk to be food and therefore question its nutritional value (Buskens et al., 2007; Wachira et al., 2009; Mataya et al., 2013). Furthermore, mixed feeding is adopted in some instances when colic is associated with hunger and inadequate breast milk (Thairu et al., 2005; Webb-Girard et al., 2012; Madiba et al., 2013). In some parts of Nigeria and Uganda however, breast milk is considered food, however water is considered a necessary supplement (Abiona et al., 2006; Fadnes et al., 2010). There were similar findings in Kenya where water is considered as “necessary for life” (Webb-Girard et al., 2012).

Theme 5: Maternal knowledge on infant feeding practices

Mothers' perception of vertical transmission through breastfeeding

Overestimation of MTCT risk through breastfeeding in HCW-provided counselling may influence women to choose EFF over EBF (Kafulafula et al., 2014; Koricho et al., 2010). Women who chose EFF or switched from EBF to EFF early postpartum expressed the desire to protect their infants from HIV infection as paramount to their decision (Thairu et al., 2005; Doherty et al., 2006b; Maman et al., 2012;). Studies from South Africa, Burkina Faso, Cameroon, and Ethiopia all reveal that in the context of formula availability and prior knowledge of EFF as a feeding option, mothers preferred EFF due to fear of infecting their infants with HIV (de Paoli et al., 2002; Hofmann et al., 2009; Koricho et al., 2010). When mothers perceive their breast milk as “poisonous” due to HIV infection, they wean their infants early postpartum, believing that such a practice would minimize infant exposure to HIV (Thairu et al., 2005; Koricho et al., 2010; Maman et al., 2012). However, a study from Nigeria revealed a contrary finding: mothers chose EFF not for fear of HIV transmission, but because of the desire to be identified among the upper socio-economic class who could afford infant formula (Abiona et al., 2006).

Mothers' experience and their knowledge and perception of exclusive breastfeeding

Mothers who practice mixed feeding and subsequently have an HIV-positive child tend to practice EBF with subsequent infants (Ostergaard et al., 2010; Chinkonde

et al., 2012; Maman et al., 2012). On the other hand, previous experience with breastfeeding, being knowledgeable about the nutritional benefits of breast milk, and associating infant mortality with formula feeding influenced mothers to choose EBF (Thairu et al., 2005; Hofmann et al., 2009; Tijou-Traore et al., 2009). Mothers with a clear understanding on how EBF may reduce postnatal transmission were more willing to choose and adhere to the practice compared to mothers who did not have such privileged knowledge (Thairu et al., 2005; Kafulafula et al., 2014; Mataya et al., 2013). On the contrary, in Zambia, even though mothers understood the dangers of mixed feeding, they found it difficult to avoid the practice (Chisenga et al., 2011). Similarly, in rural settings of Namibia, Swaziland and South Africa, the lack of pre-existing cultural norms for EBF made its practice for 6 months difficult to accept and sustain (Buskens et al., 2007).

DISCUSSION

This review sheds light on the complexities of EBF as an infant feeding choice and practice against the backdrop of socio-economic context cultural norms and biases and HCW beliefs, skills and knowledge. HIV-positive women have to navigate and/or overcome their own lack of knowledge, MTCT concerns, socioeconomic vulnerability, societal and family pressures, and vague, contradictory or biased healthcare worker messages to make the best and most feasible feeding choice for their infants. The pressure to practice EFF or mixed feeding where ART is available is particularly inappropriate for the many African women who cannot afford sustained EFF nor the negative outcomes of mixed feeding.

Women in SSA will often practice a particular feeding method in an attempt to conceal their HIV status to avoid stigma, family conflict or the loss of socioeconomic family support. This suggests that any future interventions should consider working with grandmothers, mothers-in-law, other influential matriarchs and household/community members to ensure that women are supported to practice the safest feeding method with or without HIV infection (Alder et al., 2004; Susin, 2005). As illustrated by Sibeko et al. (2009), it will also be important to encourage mothers to disclose their HIV-status to partners and family members so as to gain support on the safest feeding practice. Self-stigma or the fear of community stigma that often leads to non-disclosure of HIV has to be tackled from a community perspective, making sure to engage people living with HIV (PLHIV) in the sensitization process. Participation in PLHIV-friendly support groups can help women to cope with stigma and external pressure when making and sustaining appropriate infant feeding choices, particularly EBF.

Regardless of the risk of HIV through breastfeeding, it is still a well-entrenched infant feeding practice in SSA and guidelines on infant feeding will have to continue to

take this into consideration.

However, since breastfeeding is largely practiced within the context of mixed feeding, SSA continues to have challenges especially where much-needed ARVs to mitigate the MTCT risk may not be consistently available. The single most critical action is therefore to ensure that there are consistent supplies of ARVs for maximal, sustained coverage to HIV-infected women of child-bearing age, whether non-pregnant, pregnant, or breastfeeding. Second most important is to ensure that the rationale for infant feeding recommendations is explained to HCWs in training as well as to HIV-positive women in counselling sessions. Third, community-level education and sensitization, ideally involving PLHIV, community leaders and matriarchs, should be done on a continuous basis for sensitization, and to render living with HIV, and EBF as a feeding choice less stigmatizing.

STRENGTHS AND LIMITATIONS

The major limitation of this review is that the majority of articles included were qualitative studies with small sample sizes (ranging from 10 to 80), using purposeful sampling as the main participant selection strategy.

Despite the fact that in most of the studies, HIV-positive women were recruited from PMTCT programs, this review could not evaluate the exact infant feeding counselling delivery and content. It is highly likely that the counselling content varied significantly among studies even within the same country (Doherty et al., 2006b). This review initially intended to select articles that exclusively focused on HIV-positive women so as to explore issues experienced only by this target population; however the number of articles was few. Nine (9) of the articles identified included participants who were HIV-negative or of unknown HIV status. Studies including participants whose HIV status was negative or unknown were included because of the paucity of literature limited to HIV-positive women only.

RECOMMENDATIONS

For Ministries of Health and PMTCT implementing partners:

1. Disseminate community-wide messages on infant feeding and stigma reduction, ideally facilitated by sensitized community gatekeepers, traditional leaders, and peer PLHIV counsellors, to reinforce appropriate infant feeding guidelines. Ensure that HCWs receive structured training on counselling skills with standardized messages on quantified risk of postnatal transmission of HIV through breastfeeding.
2. Ensure that HCWs encourage and support all women to breastfeed regardless of HIV status.

For healthcare facilities, baby- friendly initiative programs and community-based organizations:

1. Encourage HIV-positive mothers to join HIV mother support groups, to gain the confidence to overcome external pressures to practice inappropriate infant feeding.
2. Educate women on maintaining a healthy diet using cheap local ingredients so that mothers can sustain EBF and minimize the 'insufficient breast milk' syndrome.

For researchers and research funding sponsors:

1. Geographically research into determinants of infant feeding choice in the context of HIV, and to include more studies at specific country and district level.
2. Increase both qualitative and quantitative research studies with larger samples to identify infant feeding decisions and strategies in women with HIV.
3. More up-to-date research into the topic of infant feeding, especially in an era where Option B+ is steadily being adopted and implemented by SSA countries.

Conflict of interests

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENT

The authors would like to thank Mr. Corey White of the African Society for Laboratory Medicine Addis Ababa, Ethiopia for providing input on the formatting of the manuscript.

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World Health Organization (WHO) (2015). Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV.

Full Length Research Paper

Assessment of factors associated with infant and young child feeding practices of human immunodeficiency virus (HIV) positive mothers in selected hospitals of Southern Nations, Nationalities, and Peoples' Region (SNNPR) Ethiopia

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Received 29 September, 2015; Accepted 4 November, 2015

Mother-to-child transmission is the largest source of human immunodeficiency virus (HIV) infection in children. About one third of children are believed to be infected vertically through breast-feeding. Infant feeding in the context of HIV is complex. HIV positive women are confused about feeding methods and mixed feeding continued to be widespread. However, there are few studies on the practice of HIV positive mothers and counseling message of health workers in Ethiopia (Maru and Haidar, 2009). Objective: The objective of this study was to assess magnitude and factors associated with infant and young child feeding practice of HIV positive mothers in selected hospitals of Southern Nations Nationalities and Peoples of Region, 2011. An institution based cross sectional study was conducted using both quantitative and qualitative methods. A total of 201 HIV positive mothers with children less than two years of age were purposively selected at morning time in order of arrival. Health workers working on anti-retroviral therapy and prevention of mother to child transmission clinics were taken for in-depth interview in Hawassa, Yirgalem and Dilla Hospitals. Of all respondent, 87 (47.5%) HIV positive mothers had children with the age of less than 6 months, among 87 (47.5%) HIV positive mothers, 56.3% had experience of exclusive breast feeding, 13 (35.6%) of the mothers mix fed their babies while 8.1% exclusive replacement feeding. Regarding issues discussed during counseling time by health workers, from total of 183 HIV positive mothers, 78.7% mothers received counseling on different feeding options. Most, 96.2 and 76.0% of mothers received counseling on advantages and disadvantages of breast feeding respectively, and 67.8 and 71% disadvantages of replacement and mixed feeding respectively. Mother's who had antenatal follow up and favorable attitude towards feeding options were more likely to practice exclusive breast feeding and less likely to practice mixed feeding. More than half of the mothers practiced exclusive breast feeding and very small proportion of HIV positive mothers chose replacement feeding, but still greater than one third of HIV positive mothers practiced mixed feeding. In general, infant and young child feeding practices observed in this study fall short of the World Health Organization (WHO) recommendations, so it is recommended that all HIV positive mothers should be provided with adequate information to enable them to select the best feeding option for their babies, and to successfully carry out their infant feeding decisions.

Key words: Infant and young child, feeding practice, HIV.

INTRODUCTION

Mother-to-child transmission of (MTCT) human immunodeficiency virus (HIV) has become a rare event in well resourced settings with the widespread access to effective antiretroviral treatment. In 2008, around 370,000 children worldwide were newly HIV infected with 90% of these in sub-Saharan Africa. Based on single point HIV prevalence estimate, in 2010, Ethiopia adult (15 to 49 years) HIV prevalence was 2.4% (urban 7.7% and rural 0.9%) while HIV positive births were 14,276 (FDRE and FHAPCO., 2010). Southern Nations, Nationalities, and Peoples' Region (SNNPR) is one of the regions in Ethiopia which has a high rate of HIV prevalence, with adult HIV prevalence of 2.3% (10.2% in urban areas and 1.5% in rural areas) (NGO, 2008).

MTCT is by far the largest source of HIV infection, with 90% of the cases infected during pregnancy, birth or breast-feeding (Groves, 2004). About 10 to 20% of the babies acquire the virus from their mothers during breast-feeding for the first 24 months (Preble et al., 2001; Preble et al., 2002). Infant feeding in the context of HIV is complex because of the major influence that feeding practices and nutrition have on child survival. HIV positive women were confused about feeding methods and mixed feeding continued to be widespread (WHO, 2010).

WHO/UNAIDS guidance states that when replacement feeding is acceptable, feasible, affordable, sustainable, and safe, avoidance of all breastfeeding by HIV infected mothers is recommended to prevent postnatal transmission of HIV infection. Otherwise, it is recommended to follow exclusive breast feeding during the first 6 months of life. The recommendation further state that HIV infected mothers should receive counseling on the risks and benefits of different infant feeding options and be given guidance and support to choose the most appropriate option for their situation (UNAIDS and WHO, 2004).

As key gatekeepers in influencing mothers' decisions on infant feeding, health workers can help to reduce rates of postnatal transmission of HIV by providing HIV-infected mothers with accurate information on infant feeding that captures the risks and benefits of different feeding options. Studying what health workers currently believe and practice regarding infant feeding for HIV infected women is an important concern because attitudes and cultural beliefs may affect their counseling behavior (Coutsoudis et al., 2002; Seidel et al., 2000).

In Ethiopia, there are few studies which address the challenges in fulfilling feeding practice of HIV positive mothers and counseling practice of health workers on infant and young children feeding practice. Hence the proposed study will help to fill an important information

gap to PMTCT program which can be used to inform policy and practice in Ethiopia sitting.

METHODOLOGY

The study was conducted from December, 2010 to May, 2011 in Hawassa, Yirgalem and Dilla hospitals. Hawassa referral and teaching hospital is located in Hawassa which is 275 km south of Addis Ababa, the capital city of Ethiopia. Currently, 1000 HIV positive women are on antiretroviral therapy (ART) of which 126 women have children less than two years old. Yirgalem Hospital is located in Yirgalem town in southern Ethiopia, located 315 kilometers South of Addis Ababa and 40 kilometers south of Hawassa. Currently, 732 HIV positive women are on ART of which 121 women had children less than two years old, and also Dilla referral hospital is located 365 km south of Addis Ababa in Gedeo Zone of SNNPR. Currently, 612 HIV positive women are on ART of which 104 women with children less than two years of age. The SNNPRS consists of 13 zones and 104 'woredas'. The region has an estimated 15,042,531 (20.4% of the national estimate) people. Close to 90% of the population are estimated to be rural inhabitants, while 1,545,710 or 10.3% are urban; this makes the SNNPR Ethiopia's most rural region.

A cross sectional study design, both quantitative and qualitative methods were used. The source of population was HIV positive mothers with children less than 2 years old and who had follow-up in Hawassa, Yirgalem and Dilla hospitals for the quantitative and Health workers in ART/PMTCT service in Hawassa, Yirgalem and Dilla hospitals for the qualitative one. 201 sample size was calculated using single population proportion formula by taking 46.8% which is exclusive replacement feeding rate of HIV positive mothers (Maru and Haidar, 2009), and using finite population correction formula to estimate final sample size (n) from a finite target population (N) =351 and by adding 10% non response rate. For the in-depth interview, seventeen health workers were selected purposively. Data was collected using pretested structured questionnaire adopted and adapted from different studies (UNAIDS and WHO, 2004). The questionnaire adopted was modified depending on the local situation and research objective.

The questionnaire contains six parts which include students' socio-demographic status, obstetric history, awareness and attitude of HIV positive mothers towards infant feeding, feeding practice of HIV positive mothers, cessation of breast feeding and assessment of counseling practice of health workers. For qualitative, data were carried through in-depth interviews with an already prepared interview guide using tape recorder. Binary logistic regression analysis was carried out to see the association between each independent variable with outcome variable and then variables that showed significant associations were included in a single model and multiple logistic regressions were performed to identify the most significant predictors. 95% CI and P-value (0.05) were used to assess the degree of statistical significance.

In the three closed ended attitude questions with Likert scales, five options were mentioned ranging from 1= strongly disagree to 5=strongly agree, and a total score was calculated. For the qualitative data, The tape recorded data was transcribed and translated .The translated data was transported to Open Code software and analyzed using thematic analysis.

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Questionnaire was prepared first in English language and later translated in to Amharic language. Another translator translated the Amharic version back into English version. Comparison was made on the consistency of the two versions. Written permission was obtained from the Hospitals administration. Each woman was informed about the purpose of the study and the right of the women not to participate in the study was respected. Confidentiality of the respondents was respected. Informed consent was obtained from HIV positive mothers and health workers. After data collection, necessary advice on different feeding options as well as side effects of mixed feeding were explained to HIV positive mothers. The dependent variable of this study was feeding practice (EBF, ERF, MF) and the independent variable includes socio demographic characteristics and maternal related factors (awareness and attitude, disclosure of HIV status, place of delivery, mode of delivery, antenatal follow up and time of first antenatal visit).

Operational definitions and measurements

Breast feeding: Refers to the child receiving breast milk direct from the breast or expressed.

Exclusive breastfeeding under 6 months: Proportion of infants 0 to 6 months of age who are fed exclusively with breast milk.

Infants 0 to 5.9 months of age who received only breast milk during the previous day

Infants 0 to 5.9 months of age

Early/Timely initiation of breastfeeding: Proportion of children born in the last 23 months who were put to the breast within one hour of birth

Children 0 to 23.9 months of age who were put to the breast within one hour of birth

Children 0-23.9 months of age

Mixed feeding: Feeding both breast milk and other foods or liquids less than six months.

Complementary foods: Introduction of solid, semi-solid or soft food in addition to breast milk.

Complementary feeding: Proportion of infants 6 to 9 months of age who receive complementary foods.

Infants 6 to 9 months of age who received solid, semi-solid or soft foods during the previous day

Infants 6 to 9 months of age

Exclusive replacement feeding: Feeding a child who is not receiving breast milk with diet that provide all the nutrients to the child needs until the child fully fed on family foods.

Cessation of breastfeeding: Completely stopping breastfeeding, including suckling.

Awareness of HIV positive mothers towards the recommended feeding options: Mothers who responded at least one correct recommended feeding options considered to be having awareness about it.

Attitude of HIV positive mothers: An opinion, outlook or idea towards recommended feeding options for HIV positive women. Three closed ended questions were applied and the response option was Likert scale ranging from strongly agrees to strongly

disagree. This scoring with the mean and above was considered to have favorable attitude.

Counseling practice of health workers: Health workers who apply recommended options during counseling of HIV positive mothers.

RESULT

A total of 183 HIV positive mothers with infants and young children 0 to 23.9 months of age from three selected hospitals of SNNPR were included in the study making the response rate 91%. The rest 9% did not respond because they were absent on their follow up date. The mean age of the mothers and their children were 26 (SD±5.5) years and 7.8 (SD±5.6) months respectively. The majority of mothers, 155 (84.7) were married. One third, 51 (27.9%) mothers had no formal education and 81 (44.3%) of husbands completed elementary school (1 to 8 grade). Eighty seven (47.5%) of respondents were Orthodox followed by Protestant, 77 (42.1%) in religion, and the dominant ethnic groups were Amhara and Sidama with 47 (25.7 %,) and 44 (24.0%), respectively. More than half, 119 (65%) mothers were house wives. But, 91 (50.5%) husbands were employed. Regarding mothers duration of living with the husband, 72 (39.3%) mothers lived 1 to 5 years. Majority of respondents, 157 (86.3%) used pipe as source of drinking water, 16 (8.8%) and 9 (4.9%) used spring and well water respectively. One third of 73 (39.9%) of respondents had monthly income of less than 400 br (Table 1).

Obstetric history and ART prophylaxis of HIV positive mothers

From the total of 183 mothers, 151 (82.5%) mothers were attending antenatal follow up, of whom majority of mothers attended during the first trimester, 108 (71.5%) followed by second trimester, 43 (28.5). Most, 155 (84.7%) mothers delivered at governmental hospital and health center followed by 19 (10.4%) delivered at home. Among those who delivered at health institution, 139 (84.7%) respondents delivered with Singular Value Decomposition (SVD) followed by Cesarean section, 15 (9.2%). The largest proportion of mothers, 111 (60.7%) and their children 148 (80.9) took prophylaxes on the onset of labor and within 72 h of birth respectively (Table 2).

Awareness and attitude towards the recommended feeding options and disclosure status of HIV positive mothers

Large proportion, 174 (95.1%) respondents heard about feeding options. Many of them 162 (93.6%) received from

Table 1. Socio demographic characteristics of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals of SNNPR, 2011, (n=183).

Variable	Frequency	Percent (%)
Age of mothers		
15-24	70	38.3
25-34	93	50.8
35-49	20	10.9
Age group of children		
<6months	87	47.5
6-11months	52	28.4
>11 months	46	25.1
Marital status		
Marred	155	84.7
Divorce	20	10.9
Widowed	3	1.7
Separated	5	2.7
Education of mothers		
No formal education	51	27.9
Write and read	20	10.9
Grade 1-8	48	26.2
Grade 9-12	50	27.3
>grade 12	14	7.7
Religion		
Orthodox	87	47.5
Protestant	77	42.1
Muslim	16	8.7
Catholic	3	1.6
Ethnic group		
Amhara	47	25.7
Sidama	44	24.0
Oromo	23	12.6
Gedeo	22	12.0
Welyta	21	11.5
Guragie	14	7.7
Others*	9	4.8
Occupation of mothers		
Employed	38	20.8
house wife	119	65.0
Merchant	18	9.8
Others**	8	4.3
Income		
<400birr	73	39.9
401-800birr	62	33.9
>800birr	48	26.2

*Others= silitie, Tigre, gamo; **others=student, supported by NGO, house maid, daily labor.

Table 2. Obstetric histories of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
ANC follow up (n= 183)		
Yes	151	82.5
No	32	17.5
Place of delivery (n= 183)		
Government hospital and health center	155	84.7
Private hospital and clinic	9	4.9
Home	19	10.4
Types of institutional based delivery (n=164)		
SVD	139	84.7
SVD with episiotomy	9	5.5
C/S	15	9.2
Forceps	1	0.6
Ever started ART (n=183)		
Yes	111	60.7
No	72	39.3
ART prophylaxis given to the mother during pregnancy (n=72)		
Yes	47	65.3
No	25	34.7
ARV prophylaxis given to the child(n=183)		
Yes	148	80.9
No	35	19.1

health professionals. One hundred sixty four (89.6%) HIV positive mothers had awareness towards recommended feeding options. Majority, 175 (95.6%) of HIV positive mothers had disclosed their sero status, and most, 131 (75%) of them disclosed to their husband. Regarding attitude of mothers towards feeding options, three closed ended questions using Likert scale were applied ranging from 1= strongly disagree to 5=strongly agree and the total sum score was calculated and those who scores above the mean considered have favorable attitude. Of all respondents, 94 (51.4%) have favorable attitude towards recommended feeding options (Table 3).

Feeding practice of HIV positive mothers

From the total of 183 HIV positive mothers, 87 (47.5%) HIV positive mothers had children with age less than 6 months. Out of 87 (47.5%) HIV positive mothers, 49 (56.3%) mothers exclusively breast fed their children, 31 (35.6%) mothers practiced mixed feeding and 7 (8.1%) mothers practiced exclusive replacement feeding (Table

4). From the total of 183 HIV positive mothers, 172 (94%) mothers ever breast fed their children of whom, 98 (57%) mothers initiated the first milk less than one hour after birth. Sixteen infants (9.3%) received food/fluid before the first breast milk. Among mothers who practiced mixed feeding the commonest reasons were, 13 (41.9%) of mothers reported it was due to infant sickness, 8 (25.8%) influenced by people advice and 7 (22.5%) conform to had custom (Figure1).

Of 87 HIV positive mothers with children with age less than 6 months, 8 (10.0%) respondents ever expressed their breast milk of whom, 1 (12.5%) feed the expressed breast milk without treating with heat. One third, 3 (37.5%) of the respondents used bottle and spoon followed by 2 (25%) bottle only for feeding the expressed milk. Six (75%) of the mothers used the expressed milk for the sake of relieving breast engorgement while 1 (12.5%) because child was unable to breast feed.

From those who ever gave replacement feeding half, 4 (50%) of mothers used home prepared food and 2 (25%) used commercial formula as replacement food. Five (62.5%) mothers had not seen demonstration how to

Table 3. Awareness and attitude towards recommended feeding options and disclosure status of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable (n=183)	Number	Percent (%)
Heard about feeding options		
Yes	174	95.1
No	9	4.9
Source of information about feeding options*		
Neighbors	16	9.2
Health professionals	162	93.6
Husband	3	1.7
Mass media	4	2.3
Awareness about recommended feeding options		
Aware	164	89.6
Not aware	19	10.4
Disclosure status of mothers		
Yes	175	95.6
No	8	4.4
Attitude		
Favorable	101	55.2
Unfavorable	82	44.8

*= more than one answer is possible.

prepare the infant formula food. Majority, 7 (87.5%) mothers had no refrigerator and some 3 (13%) of mothers did not boil water for washing utensil. Half, 92 (50.3%) respondents started complementary food, out of which, 145 (79.2%) mothers started when the children age was 6 to 9 months and 31 (16.9%) mothers started when the children age was <6 months of age (Table 4 and Figure 2).

Cessation of breast feeding practice of HIV positive mothers

From the total of 131 (71.6%) respondents who ever breast feed their children, 61 (46.5%) respondents were who would like to stop breast feeding within 6 to 12 months followed by 28 (21.4%) who would like to stop <6 months. Fifty two (28.4%) respondents ceased breast feeding at the time of data collection. From those who ceased BF at the time of data collection, 42 (84%) respondents ceased breast feeding while the child age was 6 to 12 months followed by 10 (16%) ceased breast feeding while the child age was less than 6 month. More than half, 34 (68%) of respondents ceased breast feeding due to fear of transmission of HIV followed by 18 (36%) for encouraging the child to eat solid foods. Of them who

ceased breast feeding, 31 (58.5%) of them faced different types of problems after stopping breast feeding (Table 5).

Counseling practice of health workers

Out of 183 respondents, 129 (70.5%) respondents were counseled by female health workers. During counseling sessions health workers discussed different points regarding feeding options for HIV positive mothers. Of all, 144 (78.7%) mothers received counseling on different feeding options. Most mothers received counseling on advantages 176 (96.2%) and disadvantages 144 (78.7%) of EBF. One hundred thirty six (74.3%) and 124 (67.8%) mothers received counseling on advantages and disadvantages of ERF respectively and 130 (71.0%) mothers received counseling on risk of mixed feeding. Majority, 156 (85.2%) respondents replied that they were shown demonstration on how to use the chosen feeding options.

Determinants of exclusive breast feeding

Bivariate logistic regression analysis revealed that antenatal follow up and attitude of mothers towards

Table 4. Feeding practice of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
Ever breast feed (n=183)		
Yes	172	94.0
No	11	6.0
Time of first initiation of birth milk (n=172)		
first 1 h	98	57.0
first 8 h	56	32.6
after 8 h	18	10.5
Infant received any food or fluid before breast milk (172)		
Yes	16	9.3
No	156	90.0
Expressed breast milk (n= 80)		
Yes	8	10.0
No	72	90.0
Ever gave the expressed milk (n=8)		
Yes	1	12.5
No	7	87.5
Ever replacement feed your child (n= 87)		
Yes	8	9.1
No	79	90.9
Kind of food used for replacement feeding (n= 8)		
Commercial formula	2	25.0
Home prepared	4	50.0
Both	2	25.0
Seen demonstration for preparation of RF (n= 8)		
Yes	3	37.5
No	5	62.5
Refrigerator (n= 8)		
Yes	1	12.5
No	7	87.5
Start complementary food (n=183)		
Yes	92	50.3
No	91	49.7

feeding options were significantly associated with exclusive breast feeding practice ($p < 0.05$), (Table 6). In multivariate analysis, attitude of mothers towards feeding option and ANC follow up were retained as determinant factors for EBF (Table 8). The odds of practicing exclusive breast feeding was 11 times more likely in women who had favorable attitude towards feeding options with AOR (95% CI) : 11[3.5-35.5] and the probability of practicing

exclusive breast feeding was 4.6 times more likely to mothers who had ANC follow up with AOR (95% CI): 4.6[1.3-16.6].

Determinants of mixed feeding

Among the variables of infant feeding practice, exclusive

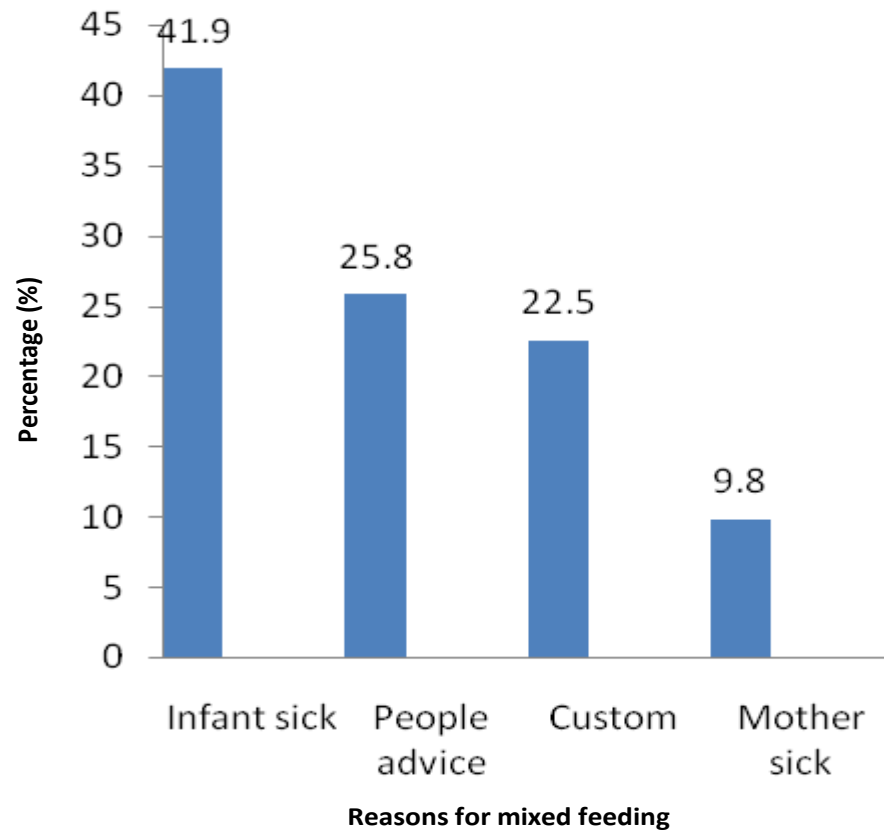


Figure 1. Reasons for mixed feeding of HIV positive mothers in selected hospitals of SNNPR, 2011.

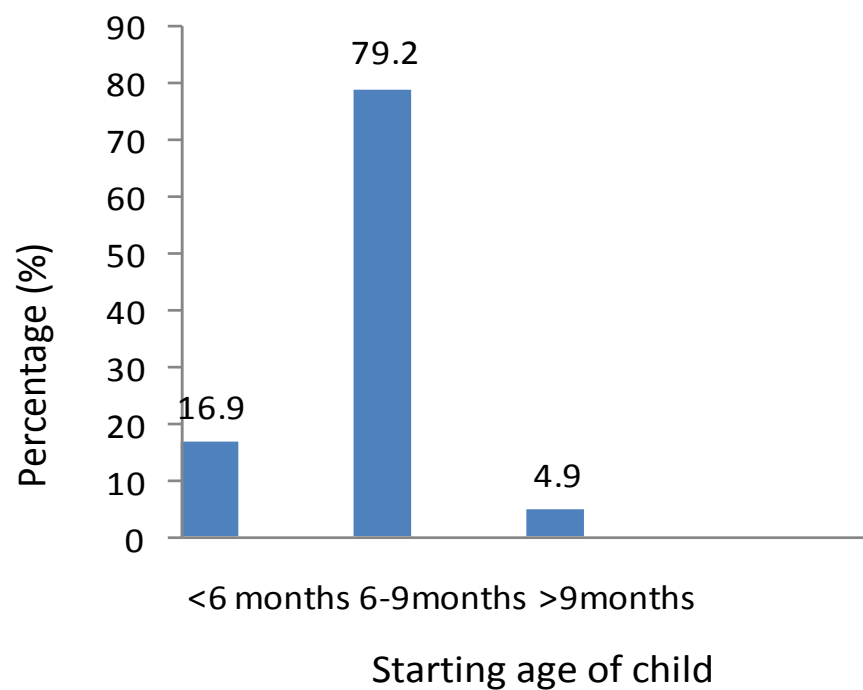


Figure 2. Starting age of complementary feeding of infants and young children in selected hospitals of SNNPR, 2011

Table 5. Cession of breast feeding practice of HIV positive mothers in Hawassa, Yirgalem and Dilla hospitals, SNNPR, 2011.

Variable	Number	Percent (%)
Currently breast feeding		
Yes	131	71.6
No	52	28.4
Age of child when stop breast feeding(n=52)		
<6months	10	16
6-12months	42	84
Reasons for cessation of breast feeding (n= 52)*		
To encourage child to eat solid foods	18	36.0
Fear of transmission of HIV	34	68.0
Advice by health professionals	8	16.0
Others	9	18.0
Faced problem after stopping BF(52)		
Yes	31	58.5
No	21	41.5

Others= Infant sick to breast feed, mother sick to breast feed, advice by husband, mother can afford to buy replacement feeding.

replacement feeding was practiced by very few numbers (7) of mothers. As a result, the numbers/proportions related to it were found to be too little for any cross tabulation or statistical test, and hence excluded from such further statistical analysis. The Bivariate logistic regression analysis revealed that mixed feeding has significant association with antenatal follow up and attitude of mothers towards feeding options, ($p < 0.05$) (Table 7). Multivariate analysis also shows attitude of mothers towards feeding options and ANC follow up retain as determinant factors for mixed feeding, (Table 9). The odds of practicing mixed feeding was 11 times more likely in unfavorable attitude towards feeding options with AOR (95% CI) : 11[1.1-15.9], and mother who had not ANC follow up was 4.2 times more likely to practice mixed feeding with AOR (95% CI) : 4.2 [1.1-15.9].

DISCUSSION

The present study investigated infant and young child feeding practices in selected SNNPR hospitals. The study revealed that more than half of HIV positive mothers experienced exclusive breast feeding, some practiced mixed feeding and very small proportion had experience of exclusive replacement feeding.

The percentage (56.3%) who practiced exclusive breast feeding in this study was higher than the figure from a study done in Addis Ababa, Ethiopia (30.6%), Kenya (35%) (Bii et al., 2008; Maru and Haidar, 2009).

This may be the comparative study areas may relied on replacement feeding (rate of RF for Kenya was 50% and Addis Ababa, 46.8%) and this shows the participants in this study area had low socio economic status to buy formula food compared to the above study areas which leads relay on easily accessible and affordable feeding option, breast feeding.

This study also identifies, from those mothers who ever breast feed, 57% of mothers timely initiated the first breast milk. This is less than a study done in Eastern Uganda (91.5%) (Fadnes et al., 2009). This may be due to socio cultural difference of the two countries. The rate of mixed feeding in the present study was 35.6% which is higher than a study done in Addis Ababa, Ethiopia (15%) and Kenya (14%), but lower than the figure from rural Uganda (61.5%) (Babirye et al., 2009; Bii et al., 2008; Maru and Haidar, 2009).

The main reason why mother gave this fluids/food other than breast milk before 6 months was; due to infant sickness (41.9%), people advice (25.8%) and custom (22.5%). Similar study in Addis Ababa (Maru and Haidar, 2009), has identified the same reasons for the practice of mixed feeding by HIV positive mothers. The rate of exclusive replacement feeding was 8.1%. Similarly, a qualitative result shows most mothers did not use replacement feeding only when mothers have the economic means to purchase formula food. These finding was lower than compared to a study done in Addis Ababa (46.8%) and Kenya, 50% of the mothers practiced exclusive replacement feeding (Maru and Haidar, 2009;

Table 6. Bivariate logistic regression analysis showing relation between exclusive breast feeding practice and selected variables of HIV positive mothers in selected hospital of SNNPR, 2011.

Variable (n=172)	EBF		COR (95%CI)
	Yes N (%)	No N (%)	
Age of mother			
15-29	34 (56.7)	26 (43.3)	1
30-49	15 (75.0)	5 (25.0)	2.3 (0.7-7.1)
Educational status of mother			
</=8 grades	34 (57.6)	25 (42.4)	1
>8grade	15 (71.4)	6 (28.6)	1.8 (0.6-5.4)
Occupation of mother			
Employed	10 (83.3)	2 (16.7)	3.7 (0.8-18.2)
Unemployed	39 (57.4)	29 (42.6)	1
Income			
<400Ebr	21 (67.7)	10 (32.3)	1
401-800Ebr	15(55.6)	12 (44.4)	0.6 (0.2-1.7)
>800Ebr	13 (59.1)	9 (40.9)	0.7 (0.2-2.1)
ANC follow up			
Yes	45 (67.2)	22 (32.8)	4.6 (1.3-16.6)*
No	4 (30.8)	9 (69.2)	1
Disclosure status of mother			
Yes	48 (62.3)	29 (37.7)	3.3 (0.3-38.1)
No	1 (33.3)	2 (66.7)	1
Attitude of mothers towards feeding options			
Favorable	38 (82.6)	8 (17.4)	9.9 (3.5-28.3)**
Unfavorable	11(32.4)	23 (67.6)	1
Awareness of mothers towards feeding option			
Awareness	47 (66.2)	24 (33.8)	6.8 (1.3-35.6)*
unaware	2 (22.2)	7 (77.8)	1
Discussion about d/t feeding option during counseling session			
Yes	22 (68.8)	10 (31.2)	1.7 (0.7-.3)
No	27 (56.2)	21 (43.8)	-

*= $P < 0.05$, **= $P < 0.01$.

Bii et al., 2008). The reason may be most mothers in this study area coming from rural sites have low access to information as well as formula food. The other reason may be as counselors said most of the mothers had low socio economic status so they cannot afford to buy the formula food. Another finding shows that, only one mother practicing expressed but not heat treated breast-milk feeding, as well as no proportion of mother used wet-nursing by HIV negative mother which is similar with

what was reported from Addis Ababa (Maru and Haidar, 2009).

This study shows that, most (79.2%) mothers started complementary food for child at age of 6 to 9 months and Small proportion (16.9%) of mothers started complementary food for child age before 6 months. This finding is almost similar with a study done in Addis Ababa (79.1 and 20.4% respectively) (Maru and Haidar, 2009). This study also shows, large proportion (95.6%) of HIV

Table 7. Bivariate logistic regression analysis showing association between mixed feeding practice and selected variables of HIV positive mothers in selected hospital of SNNPR, 2011.

Variable (n=172)	MF		COR (95%CI)
	Yes N (%)	No N (%)	
Age of mother			
15-29	26 (43.3)	34 (56.7)	1
30-49	5 (25.0)	15 (75.0)	2.3 (0.7-7.1)
Educational status of mother			
</=8 grades	25 (42.4)	34 (57.6)	1.8 (0.6-5.4)
>8grade	6 (28.6)	15 (71.4)	1
Occupation of mother			
Employed	2 (16.7)	10 (83.3)	1
Unemployed	29 (42.6)	39 (57.4)	3.7 (0.8-18.2)
Income			
<400Ebr	10 (32.3)	21 (67.7)	0.7 (0.2-2.1)
401-800Ebr	12 (44.4)	5 (55.6)	1.2 (0.4-3.6)
>800Ebr	9 (40.9)	13 (59.1)	1
ANC follow up			
Yes	22 (32.8)	45 (67.2)	1
No	9 (69.2)	4 (30.8)	4.6 (1.3-16.6)*
Disclosure status of mother			
Yes	29 (37.7)	48 (62.3)	1
No	2 (66.7)	1 (33.3)	3.3 (0.3-38.1)
Attitude of mothers towards feeding options			
Favorable	8 (17.4)	38 (82.6)	1
Unfavorable	23 (67.6)	11(32.4)	9.9 (3.5-28.3)**
Awareness of mothers towards feeding option			
Awareness	24 (33.8)	47 (66.2)	1
unaware	7 (77.8)	2 (22.2)	6.8 (1.3-35.6)*
Discussion about d/t feeding option during counseling session			
Yes	10 (31.2)	22 (68.8)	1
No	21 (43.8)	27 (56.2)	1.7 (0.7-3]

*= $P < 0.05$, **= $P < 0.01$.

positive mothers disclose their sero-status, of whom most (75.1%) of them disclose to their husband, which is similar with a study done in India (67%) (Suryavanshi et al., 2003). One of the influencing factors on the current recommended infant feeding practice among HIV positive mothers would be due to appropriate and good quality of

infant feeding counseling in the PMTCT (Newell, 2005). According to the Federal Ministry of Health (FMOH), in Ethiopia all HIV-infected mothers should receive counseling which includes provision of general information about the risks and benefits of various infant feeding options (FMOH, 2007).

Table 8. Results of multivariate logistic regression showing determinants of exclusive breast feeding practice of HIV positive mothers in selected hospitals of SNNPR, 2011. (n=172).

Variable	Exclusive breast feeding		AOR(95%CI)
	Yes (%)	No (%)	
Attitude of mothers towards feeding options			
Favorable	38 (82.6)	8 (17.4)	11 (1.1-15.9)**
Unfavorable	11 (32.4)	23 (67.6)	1
ANC follow up			
Yes	45 (67.2)	22 (32.8)	4.2 (1.1-15.9)*
No	4 (30.8)	9 (69.2)	1

*= $P < 0.05$, **= $P < 0.01$.**Table 9.** Results in multivariate logistic regression showing determinant of mixed feeding, practice of HIV positive mothers in selected hospitals of SNNPR 2011. (n=172).

Variables	Exclusive breast feeding		AOR (95%CI)
	Yes (%)	No (%)	
Attitude of mothers towards feeding options			
Favorable	8 (17.4)	38 (82.6)	1
Unfavorable	23 (67.6)	11 (32.4)	11 (1.1-15.9)**
ANC follow up			
Yes	22 (32.8)	45 (67.2)	1
No	9 (69.2)	4 (30.8)	4.2 (1.1-15.9)*

*= $P < 0.05$, **= $P < 0.01$.

However, the percentage of women who received counseling on infant feeding options were 78.7% which is comparable with study done in South Africa, where 82% mothers received information about different feeding options (Ladzani et al., 2010). Majority (96.2%), of mothers received counseling on advantage of exclusive breast feeding during counseling session, which is much higher compared to a study done in four African countries, where 25.7% of mothers received counseling on advantage of exclusive breast feeding (Chopra and Rollins, 2007). It is difficult to reason out, it may need further research to find the reason of this much discrepancy. Most (78.7%), mothers received counseling on disadvantage of exclusive breast feeding, which is similar with what was reported by the study done in four African countries (76.0%) (Chopra and Rollins, 2008).

Several (78%) respondents said they received information on the risk of mixed feeding, which is almost similar to a study done in South Africa (85%) (Ladzani et al., 2010). Another finding from this study, 55.2% of HIV positive mothers had favorable attitude towards feeding options lower than a study done in Addis Ababa (87.2%) (Maru and Haidar, 2009). The reason may be lack of full information regarding advantage and disadvantage of

different feeding options. Concerning determinant factors, mothers who had favorable attitude towards feeding options and mothers with ANC follow up were more likely to practice exclusive breast feeding but less likely to practice mixed feeding. As a study from Addis Ababa (Maru and Haidar, 2009), the present study also stated that mothers who had unfavorable attitude towards feeding options were more likely to practice mixed feeding. In agreement with finding from South Africa study (Ladzani et al., 2010), having had ANC visits was a protective factor for mixed feeding. Qualitative findings show that most health workers unable to estimate risk of HIV transmission was also reported in a studies done in Malawi (Piwoz et al., 2006).

As reported by researcher from Malawi (Piwoz et al., 2006), this study also state that majority of health workers believed that HIV-infected mothers should breastfeed exclusively; on the other hand, some health workers believed that HIV-infected women should not breastfeed because of the risk involved in transmitting the virus to the infant. Even if breast milk contains HIV virus the majority of health worker attitude incline to EBF. This may be in resource limited countries (developing countries) because the formula food does not fill full AFASS criteria.

Only few health workers believed that infant formula is preferable to exclusive breastfeeding because of the risk of contracting HIV through breastfeeding. They explained that the mothers should choose infant formula to reduce the chances of her infant contracting the disease which is in contrast from finding from Cote d'Ivoire (Becquet et al., 2003), most health workers believed that infant formula is preferable to exclusive breastfeeding. The reason may be as most of counselors reported; most mothers were unable to buy formula food.

The first strength of this study was the use of both qualitative and quantitative methods, and triangulation of finding from mothers and health workers. This study had several limitations. First, its cross-sectional design was limited in evaluating cause-and-effect associations. Second, it may be the possibility of recall bias for questions regarding time of initiation of breastfeeding, and complementary feeding

CONCLUSION AND RECOMMENDATION

More than half of HIV positive mothers had experience of exclusive breast feeding. Small proportion of HIV positive mothers had practice mixed feeding, but very small proportion practiced exclusive replacement feeding. In general, infant and young child feeding practices observed in this study fall sort of the WHO recommendations. And half of mothers had favorable attitude towards feeding options. Majority of health workers believed that HIV-infected mothers are better to breastfeed exclusively. Based on this finding, the following recommendations were forwarded first, the health worker should provide adequate information to enable HIV positive mothers select the best feeding options for their babies, and to successfully carry out their infant feeding decisions. Secondly, the regional health office should have a follow up training schedule which should be given to counselors working in PMTCT /ART sites. Thirdly, further research should be conducted by including more study sites to allow a more robust analysis.

ACKNOWLEDGEMENTS

The authors would like to thank Addis Ababa University for funding this study. They again sincerely thank the study participants for their participation in the study.

Conflict of Interests

The authors have not declared any conflict of interests.

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