

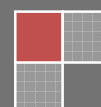
Ethiopian Public Health Association (EPHA)



EPHA Sponsored Master's Theses Extracts on HIV/AIDS Extract N0.8

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Addis Ababa, Ethiopia



Ethiopian Public Health Association (EPHA)

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Binyam Ayele, MD, MPH
Executive Director, EPHA

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EPHA

Abbreviations and Acronyms

AAHB	Addis Ababa Health Bureau
ARH	adolescent Reproductive Health
AIDS	Acquired Immuno deficiency Syndrome
ANT	Ante Natal Treatment
ART	Ante Retroviral Therapy
ARV	Anti Retroviral
BBFS	Blood and other Body Fluid Splash
BCC	Behavioral Change Communication
BSS	Behavioral Surveillance Survey
CBO	Community Based Organization
CBF	Cessation of Breast Feeding
CDC	Center for Disease Control and Prevention
C/S	Caesarian Section
CSW	Commercial Sex Workers
DHS	District Health Services
EBF	Exclusive Breast Feeding
EPHA	Ethiopian Public Health Association
ERF	Exclusive Replacement Feeding
EJHD	Ethiopian Journal of Health Development
FGD	Focused Group Discussion
HAPCO	HIV/AIDS Prevention and Control Office
HBC	Home Based Care
HCT	HIV Counseling and Testing
HCW	Health Care Workers
HIV	Human Immune Deficiency Virus
IEC	Information Education Communication
IGA	Income Generating Activities
KAP	Knowledge Attitude Perception
MTCT	Mother to Child Transmission
MoH	Ministry of Health
OE	Occupational Exposure
OI	Opportunistic Infections
OR	Odds Ratio
OVC	Orphan and Vulnerable Children
MF	Mixed Feeding
NSI	Needle Stick Injury
PEP	Post Exposure Prophylaxis
PLWHA	People Living With HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission
PPS	Probability Proportional to Size
PI	Principal Investigator
PPE	Personal Protective Equipment
STIs	Sexually transmitted Infections
SPSS	Statistical Package for Social Science
SNNPR	Southern Nations and Nationalities People Region
SRH	Sexual and Reproductive Health
SUD	Spontaneous vertex Delivery
UNFPA	United Nations Populations Fund
UNAIDS	Joint United Nations Program on HIV/AIDS
VCT	Voluntary Counseling and Testing

Message from the EPHA President

Millions of African people are still becoming infected with HIV each year. Among other major reasons, it is because the lessons learnt through out those years are not well impacted on individual behavior. Specifically speaking, the seriousness of the epidemic in Ethiopia is widely acknowledged. To this effect, the Ethiopian Public Health Association (EPHA) has been occupied in the fight against the epidemic through different actions involving members and stakeholders. One of the major strategic directions of EPHA in fighting this perilous public health problem is generating data through operational researches and availing information for conscious decision making at policy formulation and program implementation levels.

In view of the need for updated research findings and lessons learned from programme implementations in the fight against the epidemic, EPHA through the technical and financial assistance from CDC-Ethiopia has been actively engaged in operational researches since 2003. In these diverse operational researches, the association is utilizing the skills of graduate students, its members and wider public health community. More importantly, findings of operational researches are disseminated to wider audience in the country via its various publications.

This extract is one of the publications and it is a synthesis of various research outputs selected from EPHA-CDC project research awards in the area of HIV/AIDS. The 8th series of the extract summarizes findings of several public health research outputs which investigate various issues such as impact of malnutrition after initiation of Antiretroviral, assessment of HIV sero-discordance, sexual behavior and practice, determinants of sexual initiation among Youths etc.

EPHA believes that findings of the studies will inform policy makers and programme implementers in their effort to prevent and control HIV/AIDS through behavioral change interventions, improving adherence to ART, and support to those infected and affected by the virus and availing user friendly RH and HIV/AIDS services to the public. For those interested in getting more information and in-depth look to the findings of the studies, EPHA in collaboration with the authors is willing to share detailed analysis and text of the document.

On this spot, we would like to congratulate the authors as well as participants in the research activities for their important contribution without which the information for this Extract could not be gained.

As a final remark, I call upon all readers to exploit the findings and recommendations of these studies exhaustively in the implementation of programmes of which are aimed at curbing the problems of HIV/AIDS in Ethiopia and beyond.

Dr. Tewabech Bishaw

President, Ethiopian Public Health Association

Introduction

Better use of research-based evidence in public health policy and practice can help to understand the nature of diseases, design effective policies and programmes, save lives and improve quality of life. For this to happen more effectively, researchers need not only conduct quality researches but also communicate the research outputs to sector actors to inform policy makers to enhance effective service delivery. Yet, most researchers in Ethiopia do lack the financial and technological capacity to do this. Therefore, a need arises for organized efforts of institutions such as EPHA to fill the capacity gap of researchers by supporting research activities and research communications.

This paper is part of the EPHA efforts in this regard and one of the regular publications that synthesizes various research outputs. It is the 8th MPH publication in the form of EXTRACT and contains summaries of eight Master's theses studies conducted by postgraduate students for their partial fulfillment of the academic requirement in the School of Public Health, Addis Ababa University. The Postgraduates have attempted to examine critical programmatic issues on HIV/AIDS practices. The main purpose of this publication is, therefore, to promote utilization of evidence in the decision making and improve program implementation aspects of HIV/AIDS. Each of the studies has been presented separately containing brief abstracts, followed by background, objectives, study design, results, conclusions and recommendations.

The first study, deals with impact of malnutrition in survival of HIV infected children after initiation of Antiretroviral Treatment (ART). The objective of the study was to assess the impact of malnutrition in survival of HIV infected children after initiation of antiretroviral treatment.

The second study discusses HIV positive status disclosure to sexual partners among women PLWHA at Hawassa Referral Hospital, SNNPR of Ethiopia. The intention of this study was to determine the magnitude and determinants of HIV sero-status disclosure to sexual partners among women living with HIV/AIDS at Hawassa Referral Hospital, SNNPR. The third thesis attempts to assess Infant Feeding Practice of HIV positive mothers and HIV Status of their Infants in Addis Ababa. The central aim of the study was to assess the infant feeding practice of HIV positive mothers and to examine HIV prevalence of their infants.

The next study attempts to examine median age and determinants of sexual initiation among youths in the North East Ethiopia. Therefore, this study tries to examine the median age and various paths of the commencement of first sex among rural and urban youths.

The fifth one conducts an assessment of HIV sero-discordance, sexual behavior and practice of preventive behavior against HIV among premarital couples attending VCT in Bahir Dar, Northwest Ethiopia. The central objective of this study was to assess sero-prevalence of HIV, practice of preventive behavior and sexual behavior among premarital couples in Bahir Dar, Ethiopia.

The sixth thesis goes to investigate the occurrence of occupational exposures and knowledge and practice regarding HIV post-exposure prophylaxis among health care workers in health centers and hospitals of Addis Ababa.

The seventh thesis tries to assess HIV sero-status disclosure among clients attending ART clinics in Bahirdar, capital of the Amhara National regional state. Its objectives were to determine the rates, barriers and outcomes of HIV sero status disclosure among clients attending ART clinics in Amhara National Regional State, Bahirdar Town. The final thesis\ on the other hand, attempts to assess quality of antiretroviral therapy service in Felege Hiwot Hospital at Bahirdar Town.

As you go through the extract we hope that the studies will provide comprehensive information for health professionals, program implementers, policy makers and other stakeholders working in areas of HIV/AIDS control. Good Work!

THESIS-ONE

Impact of Malnutrition in Survival of HIV Infected Children after Initiation of Antiretroviral Treatment (ART)

Bineyam Taye

ABSTRACT

Background: - Malnutrition is a common condition in HIV-infected children; however, its impact in survival of HIV infected children after initiation of antiretroviral therapy is not well understood.

Objective: - To assess the impact of malnutrition in survival of HIV infected children after initiation of antiretroviral treatment.

Design: - A retrospective cohort study was conducted in HIV infected children starting antiretroviral treatment at Zewditu memorial hospital, Addis Ababa, Ethiopia. Demographic, nutritional, clinical and immunological data were carefully extracted from the existing ART logbook and patient follow up cards. Accordingly, nutritional status were defined with stunting (height for age Z score <-2), Wasting (weight for height Z score <-2) and under weight (weight for age Z score <-2). Survival was defined as the time from nutritional and immunologic evaluation to death. Data were analyzed for univariate and multivariate analysis using Cox regression proportional hazard model. Survival rate was calculated and compared with the Kaplan Meier and log rank tests.

Results: - A total of 475 HIV infected children with antiretroviral treatment (ART) from the 21st of March 2005 to 30th April 2008 were included in the study. Of whom, 42 (8.8%) died during a median study follow up of 12 months. The average survival time for the entire cohort was 27.9 months.

Independent baseline predictors of mortality were severe wasting (Hazard ratio (HR) = 4.99, 95% CI 2.4 – 10.2, P<0.00), absolute CD₄ below the threshold for severe immunodeficiency (HR = 3.02, 95% CI 1.02 – 8.96, P = 0.04) and low hemoglobin value (HR= 2.92, 95% CI 1.3 – 6.7, P=0.001 for those hemoglobin value < 7.0gm/dl). The

probability of surviving for wasted children declines sharply starting from 6th months and reach 76% in 12th months.

Conclusion: - Despite the apparent benefit of ART use on HIV related survival, severe wasting (WHZ<-3) appear to be strong independent predictor of survival in HIV infected children receiving ART.

KEY WORD: Malnutrition, HIV, survival, ART, antiretroviral treatment, children, wasting

INTRODUCTION

Treatment of HIV- infected children with antiretroviral therapy (ART) leads to immune reconstitution as shown by increase in CD₄ lymphocyte counts, decreased risk of opportunistic infection and improved survival (1, 2), however, not all children have an optimal response to therapy. Viral load may not be well controlled because of poor drug adherence or other factors leading to the development of drug resistance. Some children, even when viral replication is controlled, have slow and incomplete recovery of immune function and remain at greater risk of AIDS associated events and death than those who show more rapid reconstitutions (3). Moreover, children may die with undetectable viral load and adequate CD₄ count recovery (4). Therefore, adjunctive treatments that accelerate the recovery of the immune function or that address other related cause of mortality may provide additional gain in survival of children with advance disease starting ART. On this regard nutrition related complications remain a challenging issue for HIV-infected children involving in ART.

Several studies have been conducted to see the relationship between malnutrition and HIV- infected adult survival after initiation of ART (5, 6, 7, and 8); however, there is limited information in developing countries in general and in children taking ART in particular. Therefore the present study is designed to assess the impact of malnutrition in survival of HIV infected children after initiation of ART.

SUBJECT AND METHODS

Study design: - A retrospective observational cohort study was used among HIV infected children who had started combination of ART (defined as two or drugs taken for at least 3 months), by WHO clinical and immunological Criteria (9), between March 21, 2005 to April 30 2008, and who had CD₄, body weight, and height measurement taken at the time of

starting ART. The study was conducted in Addis Ababa, Ethiopia, Zewditu memorial hospital pediatric ART unit. It is one of the first Hospitals to start ART services since July 2003.

Demographic and clinical characteristics: - Participant demographic variable, antiretroviral treatment outcome, course of disease, prophylaxis taken and type of ART regimen were carefully extracted from ART log book. In addition to this, absolute CD4 T lymphocyte counts which were performed by flowcytometer (FACScan. Becton Dickinson, San Jose, CA, USA) were collected with standardized questions from ART log book. Cut-off point for CD4 T lymphocyte counts at different age group were those that related to the category of severe immunodeficiency for less than one year- less than 1500 cell/ μ l, for 1-3 years- less than 750 cell/ μ l, for 3-5 years- less than 350 cell/ μ and for more than 5 year- less than 250 cell/ μ l (10).

Nutritional Assessment: - Nutritional status was defined by both body WAZ, HAZ, and WHZ. Body weight and height were measured routinely at each visit. Stunting were defined (height for age Z score < -2), wasting (weight for height Z score < -2) and under weight (weight for age Z score < -2). Severe malnutrition was also defined as severe stunting (height for age Z score < -3), severe wasting (weight for height Z score < -3) and severe underweight (weight for age Z score < -3) according to NCHS/WHO reference (11, 12).

Survival status

Survival was defined as the time following the start of ART to death from any cause. Survival status was assessed during monthly visit to Zewditu hospital ART clinic by the child and care giver. Children who died during the follow up were registered in ART registration book.

Statistical analysis: - Cox proportional hazard models were used to determine the relative risk of death for each baseline predictor of survival.

To assess the association between baseline variable and mortality two strategies were used. First each baseline variable was entered into a separate Cox proportional hazard models. The relative hazards and likelihood ratio test statistics from these models were then used to decide which parameter was statistically associated with mortality.

Second multivariable adjusted model was fitted with the predictors that were statistically significant at $P \leq 0.10$ in the univariate analysis; however only those that remained significant at $P \leq 0.05$ were retained in the final model.

Kaplan Meier survival analysis was applied to estimate survival time probability after introduction of ART. Factors related to different survival time were also compared with Log rank test.

Median change of different nutritional parameter from the baseline was compared using Wilcoxon Signed rank test.

Data analysis performed by SPSS Version 15.0 software (SPSS INC, Chicago, IL, USA) and EPI-INFO 2002 (Centers for Disease Control and Prevention Atlanta, GA) for Anthropometric data.

RESULTS

A total of 475 HIV infected children starting ART have been monitored from 0 to 30 months (median 12 month) and 372 (78.3%) children are still being monitored. Forty-two (8.8%) children had died and 61 (12.8%) had been lost to follow up. The majority 34 (80.9%) of the deaths were observed during the first 6 month follow up period. The mean survival time of the entire cohort using Kaplan Meier analysis was 27.9 months (95% CI 27.3-28.5). The demographic and clinical characteristics of the cohort are shown in Table 1. The most widely used ART regimen in this cohort was AZT-3TC NVP 233 (49.1%) followed by d4t-3TC-NVP 186(39.2%) and 34(7.1%) children change the first line regimen due to adverse drug event 29 (6.1%), new TB 3 (0.6%) and others 2(0.3%).

Table 1 Baseline demographic and clinical characteristics of children started on antiretroviral treatment at Zewditu memorial Hospital pediatric ART units; Addis Ababa, May 2008.

Variable	Frequency	Percent
Sex		
Male	248	52.1
Female	227	47.8
Age group		
< 1.5	12	2.5
1.5-5	132	27.5
6-14	331	69.7
Functional status		
Ambulatory	162	34.1
Bedridden	25	5.3
Work	288	60.6
WHO clinical stage		
I	24	5.1
II	109	22.9
III	237	49.9
IV	105	22.1
Hemoglobin (gm/dl)		
<7.00	53	11.2
7.01 – 8.50	24	5.1
8.51 – 10.0	88	18.5
>10	310	65.5
AbsoluteCD4 cell count		
Below Threshold	322	67.8
Above Threshold	153	32.2

The nutritional status of the study participant at baseline showed that, 264 (55.6%) stunted, 82 (27.3%) wasted and 290 (61.1%) under weight. In addition children were also classified as severe malnourished as severe stunting 139 (34.1%), severe wasting 33 (7.4%) and severe underweight 164 (40.8%) with the most affected age group by severe malnutrition were age group <1.5 year (Table 2).

Table 2 Baseline nutritional statuses among children starting antiretroviral treatment at Zewditu memorial hospital pediatric ART unit stratified by age, Addis Ababa, May 2008.

Nutritional parameter	Age group			
	<1.5	1.5-5	6-14	Total
Stunting (HAZ <-2)	6 (50.0%)	64 (48.5)	194 (58.6%)	264 (55.6%)
Severe stunting (HAZ<-3)	5 (41.5%)	46 (34.8%)	108 (32.6%)	159 (33.5%)
Under weight (WAZ<-2)	8 (66.7%)	60 (45.5%)	222 (67.1%)	290 (61.1%)
Severe under weight (WAZ<-3)	8 (66.7%)	41 (31.1%)	144 (43.4%)	193 (40.6%)
Wasting (WHZ<-2)	8 (66.7%)	24 (21.1%)	50 (28.7%)	82 (27.3%)
Severe Wasting	7 (41.7%)	13 (11.4%)	27 (15.5%)	47 (15.7%)

The relationship between the main baseline variable and the risk of death was analyzed using univariate Cox proportional model. The result has shown that, age group <1.5 year, functional status, WHO clinical stage, low hemoglobin value (Hgb<7.0gm/dl), stunting, wasting, under weight and absolute CD4 count below the threshold were all significantly associated with child mortality (Table 3.1&3.1).

Table 3.1 Univariable predictor of risk and death (N=475) among children taking ART at Zewditu hospital pediatric ART unit, Addis Ababa, May 2008.

Covariates	Number at risk	Number of death	Hazard Ratio(HR)	95% CI	P-value
Gender					
Male	248	22	0.993	(0.52-1.87)	0.982
Female	227	20	1		
Age group					
<1.5	12	4	5.630	(1.5-19.9)	0.07
1.5 – 5	132	11	1.024	(0.49-2.12)	0.95
6 – 15	331	27	1		
Functional status					
Ambulatory	162		3.5	(1.72-7.12)	0.001
Bedridden					
Work	25		6.680	(6.6-19.5)	0.001

	288		1		
WHO clinical stage					
I	24	0	-	-	-
II	109	7	0.355	(0.14-0.89)	0.02
III					
IV	237	18	0.425	(0.21-0.86)	0.018
	105	17	1		
Prophylaxis taken					
Bacterium	466	40	3.043	(0.61-15.1)	0.153
Others	9	2	1		
Types of ART drug regimen					
d4t-3TC-NVP	186	21	0.191	(0.03-1.20)	0.079
d4t-3TC-EFV					
AZT-3TC-NVP	27	4	0.261	(0.03-2.08)	0.206
AZT-3TC-EFV					
Others	233	11	0.074	(0.11-0.49)	0.007
	24	4	0.300	(0.03-2.41)	0.258
	5	2	1		
Hgb value gm/dl					
<700	53	15	6.046	(2.83-12.8)	< 0.000
70.1-8.50					
85.1-10.0	24	3	2.188	(0.59-7.99)	0.236
>10.0					
	88	5	0.923	(0.92-0.33)	0.876
	310	19	1		
Stunted children (HAZ<-2)					
No	211	12	1		
Yes	264	30	2.032	(1.04-3.97)	0.038
Severe stunted (HAZ<-3)					
No	294	22	1		
Yes	139	20	1.92	(1.02-3.64)	0.045
Wasted children(WHZ<-2)					
No	218	13	1		
Yes	82	17	3.58	(1.73-7.38)	0.001
Severe wasted(WHZ <-3)					
No	237	14	1		
Yes	33	16	6.28	(2.81-14.4)	< 0.000
Under weight (WAZ<-2)					
No	175	10	1		
Yes	285	32	2.12	(1.04-4.3)	0.038
Severe underweight (WAZ<-3)					
No	269	13	1		
Yes	164	29	3.66	(1.85-7.29)	< 0.000
Absolute CD4 count					

Below threshold	286	36	3.08	(1.27-7.48)	0.013
Above threshold	147	6	1		
TB treatment at start					
Yes	129	14	0.72	(0.36-1.42)	0.346
No	346	28	1		

When analysis of univariate predictor of death include severe malnutrition as severe wasting, severe stunting and underweight, the risk of death become increased by two fold for severe wasting (HR=6.28, 95% CI 2.8-14.4) and severe underweight (HR=3.66, 95% CI 1.85-7.2), however severe stunting shows less pronounced with HR =1.92, 95% CI (1.01-3.60).

When using the multivariate Cox proportional hazard adjusted model, only three factors such as, severe wasting HR 4.99,(95%CI 2.4-10.2,P=0.0000), low hemoglobin value HR=2.92 (95%CI 1.3 – 6.7, P=0.01 for those Hgb<7.0gm/dl) and absolute CD4 count below the threshold for sever immunodeficiency HR 3.02, (95%, CI 1.02-8.96 p=0.04) were confirmed as significant independent predictors of death after controlling for the other factors (Table 4).

Table 4; Multivariate analysis (Cox model) of baseline characteristics associated with death in children with HIV infected and placed on antiretroviral therapy in Zewditu Hospital pediatric ART unit Addis Ababa, May 2008.

Covariates	Number of risk	Number of death	Hazard ratio	95%CI	P-value
Severe waste (WHZ<-3)					
No	237	14	1		
Yes	33	16	4.93	(2.39-10.20)	< 0.00
Hemoglobin values gm/dl					
<7.00	53	15	2.92	(1.28-10.20)	0.01
7.01-8.50	24	3	1.39	(0.31-6.10)	0.66
8.51-10.0	88	5	0.49	(0.14-1.70)	0.26

	310	19	1		
>10.0					
Absolute CD4 count					
Above threshold	147	16	1		
Below threshold	286	36	3.028	(1.02 -8.96)	0.04

Further analysis comparing the mean survival time according to nutritional status (WHZ) stratified by sex, showed that the mean survival time of female children with wasting was 20.1 months (95% CI 17.7-22.5) while, it was 25.2 (95% CI 22.5-28.0) for male children with the same condition.

Similarly, analysis of survival for severe wasting with sex strata showed, a lower likelihood of survival for female children which was 18 months (95% CI 14.3-21.6) compared to the 23.7 months (95% CI 19.7-22.7) for males. The difference in survival time for wasted children adjusted by sex was highly significant (log rank test $P < 0.000$).

As shown in the Figure 1, there was a decrease in survival rate of children with wasting after initiation of ART. The probability of surviving for wasted children declines sharply starting from 6th months and reach 76% in 12th months

The median change of nutritional parameters from the baseline were compared using Wilcoxon Signed rank test, the result showed that, median WAZ, WHZ and BMIZ score were having a statistically significant change from 6, 12, and 24 months to the baseline as increased trend, however, median HAZ score change from baseline were statistically significant only at 24 months (figure 1).

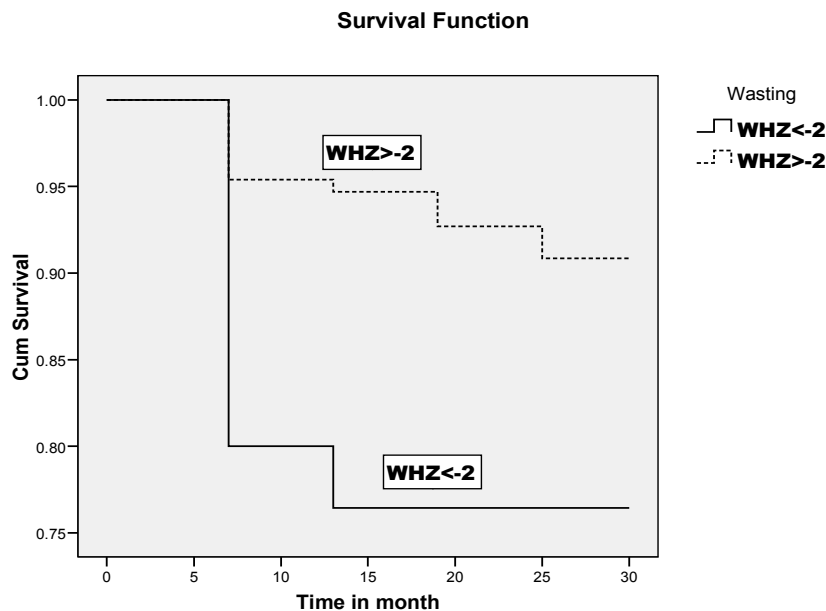


Figure 1 Survival curves of HIV infected children after the start antiretroviral therapy according to the nutritional status (WHZ score) at the time of initiation of ART, Addis Ababa, May 2008.

DISCUSSION

The present study showed that the prevalence of Malnutrition among HIV infected children at the time of initiation of antiretroviral treatment (ART) was very high (61% under weight, 55.6% stunting and 27% wasting) in comparison to the Ethiopian demographic health survey (EDHS) 2005 (13) reports. The difference observed was due to the fact that, the study participants in the present study were HIV infected and immunodepressed children. A study by Grunfeld C et al (14), clearly documented that malnutrition is a common phenomena in HIV infection due to decrease caloric intake, malabsorption of nutrient, elevated energy needs during secondary bacterial and systemic opportunistic infection.

The result of the present study has also shown that, the average survival time for children in the cohort was 27.9 months with a mortality rate of 8.8% which is in agreement with a cohort study among HIV infected children at Haiti (9%) (15). Moreover the higher mortality rate during the first 6 month follow up was also consistent with the study in Haiti and Malawi (15, 16).

Our results also showed that, 6 month survival rate for children age group less than < 1.5 were 64% which is lower survival rate in comparison with the Haitians study (15). This difference may be due to various interventions (social service, nutritional intervention and pneumocystis prophylaxis) that have been sequentially introduced to their cohort.

In this study, the effect of baseline variable in survival of HIV infected children after initiation of ART showed that malnutrition, low hemoglobin (Hgb<7gm/dl) and low CD4 count (below the threshold level for severe immunodeficiency) were significantly associated with reduced survival in children commencing antiretroviral treatment (ART) after adjusting for the observed confounders using Cox model. Children who were classified as severe wasted were found to be at higher risk of death. The associations observed between wasting or low CD4 count and child mortality are in agreement with finding from previous studies (15, 16, and 17).

One retrospective cohort study in Malawi (16) found severe wasting and severe immunodeficiency were factors associated with death of children after initiation of ART. A similar study in Tanzania (17) also reported the same factors (wasting, low hemoglobin and stunting) to be significantly associated with child mortality after adjustment was made for possible confounders. However, the later study includes stunting which is in contrast with our report. This may be due to the fact that, impact of anthropometric indicators on mortality is augmented by incidence of infection as a multiplicative synergistic manner (18) and this interaction appear to be particularly strong for indicators of wasting (17), however such interaction was not tested in the present study. These findings should not be misinterpreted to mean that stunting is without hazards. The state of being stunted or "Small" is often associated with a decreased capacity for physical work later in life, increased morbidity and adverse poor mental development; making, stunting is a descriptive index of the adverse environment during early growth and development.

Furthermore, we found that wasted children had reduced survival by 2 to 7 months, and 4 to 9 months for severely wasted male and female children respectively. This was in agreement with a study conducted in Milan (19) which reported a reduced survival by 9 month for children with underweight. Although some of studies have not shown clearly the number of month lost as result of malnutrition, they documented the fact that malnutrition in the form of wasting and underweight was responsible for reduced survival (15, 16, and 17).

The mechanism by which malnutrition might act to decrease survival is uncertain; the hypothesized reason is malnutrition might impair immune reconstitution and thereby prolong the period at which patient remain at increased risk of opportunistic infections (18). In addition the association of infection-induced cachexia to mortality has been well documented in adult acquired immune deficiency syndrome (AIDS) patients (20) and is probably induced by the effect of recurrent infections on food intake, absorption and energy expenditure (21). An alternative possibility is that poor nutritional status accelerates the progression from a symptomatic HIV infection to AIDS (22). However, this possibility cannot be definitively confirmed from the present study.

In this study, a growth change after taking ART at different follow up time were analyzed using different nutritional parameters, the finding showed that, a significant increase in median WAZ, WHZ, BMIZ score for the entire cohort at 0, 6, 12, 24 month follow up which is comparable with a study conducted in Haiti with increased median WAZ score -2.0,-1.4,-1.3,-1.2 at 0, 6, 12, 24 month respectively (16). A study by Verweel GW et al, (23) demonstrated a significant increase in weight for age following ART but not for HAZ score in early follow up which was also observed in our study. This can be explained by the fact that catch up of growth is likely to affect weight than height. The increased trend of nutritional indices in our study can be explained as; the energy expenditure previously needed to combat infection was possibly used for catch-up growth after initiation of antiretroviral treatment.

Some of the limitation in our study could partially explain the lower estimate we obtained. First nearly 12.8% of children were lost to follow up and many physicians have anecdotal evidence that a significant proportion had in fact died. Lack of information on some risk factor for child mortality that could have confounded some of the association observed, this may include birth weight, HIV status of the mother inter-pregnancy interval, access and utilization of health services, socio economic status and opportunistic infections.

We conclude that malnutrition in the form of severe wasting ($WHZ < -3$) appear to be strong independent predictor of survival than the CD4 cell count and hemoglobin level in HIV infected children receiving antiretroviral therapy at Zewditu Memorial Hospital Addis Ababa Ethiopia.

Finally, in view of the magnitude of the problem and potential benefits; nutritional intervention employed as an adjunct at the time of starting ART could accelerate the recovery of malnourishment which may further translate in to improved physical function, quality of life and survival of HIV infected children receiving ART. The potential effect of

micronutrient, protein and energy supplementation in children receiving ART also deserve evaluation.

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THESIS-2

HIV Positive Status Disclosure to Sexual Partners among Women PLWHA at Hawassa Referral Hospital, SNNPR - Ethiopia

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ABSTRACT

Background: Disclosure of HIV status may lead to increased opportunities for social support in order to discuss and implement HIV risk reduction with partners and improved access to treatment. Thus, status disclosure is major public health goal for HIV prevention & treatment

Objective: Determine the magnitude and determinants of HIV sero-status disclosure to sexual partners among women living with HIV/AIDS at Hawassa Referral Hospital, SNNPR.

Method: A Cross sectional survey was conducted among 384 HIV positive women who had sexual partner and age ≥ 18 years attending ART clinic from March to April 2008. Using a structured and pre-tested questionnaire, data were collected through patient interview consecutively until the required number reached over one month period. Ethical clearance from concerned bodies and informed consent from participants were obtained.

X^2 tests, odds ratios and logistic regression were done to explore associations between different variables and status disclosure.

Result: Overall, 85.7% of the women had disclosed their HIV positive status to their sexual partners. The common barriers reported for non disclosure of HIV status were fear of abandonment; fear of break-up in relationship and fear of stigma. The negative partner reaction reported by those women who disclosed to sexual partner in this study was found to be high (59.3%). The majority (77.9%) had sexual intercourse in the past 6 months. 9.1% of the women were pregnant since they tested for HIV and condom was inconsistently used by most of the women. Being married, taking ARV treatment for more than one year and knowing the HIV status of the sexual partner were predictors of HIV positive status disclosure.

Conclusion: Even though, the magnitude of HIV positive status disclosure to sexual partner in this study is encouraging, negative partner reactions following disclosure were

reported by large proportion of women. Follow up counseling, couple counseling and testing, integrating ART service to reproductive health service particularly F/P should be emphasized in order to facilitate safe status disclosure and to address the sexual and reproductive health needs of PLWHA's.

INTRODUCTION AND LITERATURE REVIEW

The estimated numbers of people living with HIV/AIDS in SNNPR by the year 2007 were 132,410, of which the majority (59%) were females. HIV testing and counseling service is a critical prevention and treatment tool in the control of the HIV epidemic. Within HIV testing and counseling (VCT) service component, emphasis is placed on the importance of HIV status disclosure among HIV infected clients, particularly to their sexual partners. Disclosure may motivate sexual partners to seek testing, change behavior and ultimately decrease transmission of HIV. Through disclosure of her status, a woman may receive support from her family or others in her social network and may be able to access available support services. In addition, a woman may be more willing to adopt and maintain health behavior such as cessation of breastfeeding or adherence to treatment regimens. However, disclosure of HIV status may have potential risk for the infected women. These risks include loss of economic support, blame, discrimination, disruption of family relationship and so on. These risks may lead women not to disclose their HIV status, which in turn leads to missed opportunities for prevention of new infections to their partners and infants (1, 2, 3).

Meta analysis conducted among many studies showed that, in developed countries the disclosure rate to sexual partners ranged from 42% to 100%; with the average disclosure rate of 79%. Where as, for developing countries the rate was ranged from 16.7% to 86%; with the average disclosure rate of 49% (2). According to a study conducted in Gore and Mettu Towns, Ethiopia, HIV positive status disclosure rate was found to be 69% (5). The main reasons for not sharing the HIV status to sexual partner were fear of stigma and rejection, fear of being accused as the source of infection, fear of accusations of infidelity or being considered unfaithful, fear of separation/divorce, fear of shaming their family, fear of being rejected or abandoned and fear of blame (2, 5).

The negative outcomes of disclosure reported by many researchers include blame, abandonment, anger, violence, stigma, and depression. An important finding from both developed and developing country studies is that disclosure was not associated with the break-up of long-term relationships. Even if the fear of most women to disclose is break-up of relations, disclosure was not associated with abandonment (2, 5)

There are also reports that indicate HIV positive sero-status disclosure may be affected by many factors. These factors include, socio-economic status, age, duration of relation with the partner, level of education, culture, discussion on HIV and its test among the partners before the test, number of partners and so on. In addition, variation in rates of HIV status

disclosure to sexual partners among different ethnic groups was also identified. This suggests that there may be important cultural factors that influence the patterns of self-disclosure to sexual partners. It is also indicated that, as the length of time since diagnosis increases the rate of disclosure also increases (2).

According to the Ethiopian DHS (2005), to date only about 2% of the HIV positive pregnant women who are in need of PMTCT have benefited from the services. One of the reasons for low participation is , non-disclosure of HIV test result to sexual partners. The uptake and adherence to PMTCT is difficult for women whose partners are unaware of their status (3).

Therefore, this study could give recent valuable data that can be used to compare with results of similar other research in Ethiopia and other countries. Furthermore, the finding will be an input to the HIV prevention endeavor in devising evidence based intervention regarding status disclosure.

OBJECTIVE

Determine the magnitude and determinants of HIV sero-positive status disclosure to sexual partners among women PLWHA at Hawassa Referral Hospital, SNNPR.

METHODS AND MATERIALS

Study design and Area:-Cross sectional study was conducted from March to April 2008 at Hawassa Referral Hospital, Hawassa town, which is the capital city of South Nations and Nationality Peoples Region (SNNPR) and is located 270 km south of Addis Ababa. The Hospital currently provides comprehensive health services including, ART and PMTCT. The ART clinic was established in June 2006GC and at the end of February 2008,there were 1110 cases were on ART in the clinic.

Source and Study population:-All PLWHA attending ART clinic in Hawassa Referral Hospital were source population. The study subjects were women who had sexual partner; at least 18 years old, able to give informed consent and not seriously ill who were taken from the source population.

Sample size determination and sampling techniques:-Based on the formula for estimating single population proportion, prevalence of HIV status disclosure for developing countries on average 49% (2), 5% level of significance and 5% margin of error, a sample size of 384 was calculated.

Study subjects were selected using convenience sampling method. Based on the inclusion criteria, all eligible women PLWHA who came for follow up and treatment from March to April 2008, over one month period, were interviewed consecutively until reaching the required sample size.

Data collection:-After informed consent obtained from the respondents, interviewer administered pre-tested questionnaire was used to collect the data by female counselors.

Data process and Analysis:- Data was entered, cleaned using EPI info version 2002 and analyzed using SPSS version 12.1 and EPI info version 2002 softwares. Odds Ratio and P-value at 5% was used to identify the relationship between HIV status disclosure and the independent variables.

Independent Variables:-Socio-demographic variables (age, occupation, marital status, religion, ethnicity, educational level, monthly income), type of partnership, membership to PLWHA association, discussion between couples on HIV related issues, duration of relation with partner, duration since tested and duration since ARV treatment started were taken as independent variables.

Dependent Variable: - HIV positive status disclosure is the dependent variable of the study.

Ethical Consideration: - Ethical clearance was obtained from the Research and publication Committee; written letter of permission from School of Public Health, Addis Ababa University and Hawassa Referral Hospital Medical Director and informed consent was obtained from the women.

RESULT

Socio-Demographic Characteristics

A total of 384 women were interviewed. Majority 348 (90.6%) of the women were from urban area. The dominant ethnic groups were Wolayta and Amhara, 116 (30.2%) and 109 (28.4%), respectively. More than half (54.4%) of the women were Orthodox Christians. The age range of the women was from 18 to 57 years and 293 (76.3%) of them were less than 35 years old with mean and 152 (SD) of 29.5 (7.1) years respectively. One hundred and twenty (31.3%) have attended primary school, (39.6%) were house wives, 247 (64.3%) were married and 215 (56%) had an average monthly income of less than or

equal to 250 birr. Two hundred seventy (29.4%) of them were members of PLWHA association and 66.9% of the women have started ARV drugs. The duration of diagnosis for the study subjects ranged from 1month to 84 months. One hundred fifty seven (43.3%) of the women had known their HIV status for less than one year (Table 1).

Of all (384) the women, 90.1% reported having regular sexual partner while, 9.9% have non-regular partners. 299(77.9%) of the women had sexual intercourse in the past 6 month. Thirty five (9.1%) of the participants were pregnant since tested for HIV. The pregnancies were not intentional in 9(25.7 %) of them. Concerning condom use, 30.6% and 67.9% of the women with regular sexual partners used condom always and last time they had sexual intercourse, respectively.

HIV positive status disclosure

Three hundred fifty four (92.2%) of the respondents disclosed their HIV positive status to someone and 329(85.7%) disclosed to their sexual partner. The rate of HIV positive status disclosure varies by the type of sexual partners of the women. It was 71.1% and 87.3% for non regular and regular sexual partner respectively.

The rate of disclosure to any one (92.2%) was achieved over a period of time. Two hundred sixty two (68.2%) of the participants disclosed within one month, (15%) between 1month and 6 months, 5.2% after 6month of diagnosis and the rest 3.1% did not remember. The first individual to whom the respondents disclosed their HIV result was mainly to sexual partners 267(75.4%) and more than half 219(57%) of them next disclosed their HIV positive status to family members.

The main reasons for disclosure of HIV result to sexual partner in 347(98%) of the study participants were felt responsibility, concern for not to risk other's health, seeking social support, and in 89.5% of the participants to teach others about the disease.

Table 1 Socio-demographic characteristics of women PLWHA attending ART clinic, Hawassa Referral Hospital, SNNPR, April 2008.

Variables (n=384)	Number	%
Age(in years)		
18-24	102	26.6
25-34	191	49.7
≥35	91	23.7
Religion		
Orthodox	209	54.4
Protestant	122	31.8
Muslim	40	10.4
Other	13	3.4

Educational level		
Do not read and write	86	22.4
Read and write	36	9.4
Primary	120	31.3
Secondary	102	26.5
Certificate and above	40	10.4
Occupation		
Government employee	51	13.3
House wife	152	39.6
Merchant	63	16.4
Daily laborer	47	12.2
Student	31	8.1
Farmer	21	5.5
Others	19	4.9
Ethnicity		
Wolayta	116	30.2
Amhara	109	28.4
Sidamo	61	15.9
Oromo	41	10.7
Gurage	27	7
Others	30	7.8
Current marital status		
Currently married	247	64.3
Cohabiting	71	18.5
Never married	25	6.5
Others(Divorced, Widowed)	41	10.7

Barriers to HIV sero-status disclosure

The most common barriers to disclose the test results as reported by the women were fear of stigma and rejection (89.1), client skill and psychological factors (47.3) such as difficulty of accepting the test result and didn't know how to tell the diagnosis, fear of abandonment (45.5), fear of confidentiality(38.2) and fear of accusation of infidelity(3.6) (Table 2).

Table 2 Barriers to disclose HIV positive status among women attending ART clinic, Hawassa Referral Hospital, SNNPR, April 2008 (n=55)

Barriers to status disclosure	□	Women
having regular sexual partner	□	Women having
(n=44)	□	Women having regular sexual partner
(n=44)	□	Women having
Women having	□	Women having
non regular sexual partners	□	non regular sexual partners
(n=11)	□	(n=11)
Total	□	Total
(n=55)	□	(n=55)
□		
□	Number (%)	□
(%)	□	Number (%)
Number (%)	□	Number
(%)	□	Number (%)
Number (%)	□	Number (%)

Number (%)		
1. Fear of stigma and rejection		
38(86.4)	11(100)	
49(89.1)		
1. Fear of stigma and rejection		
38(86.4)	11(100)	
49(89.1)		
38(86.4)	11(100)	
49(89.1)		
11(100)	49(89.1)	
49(89.1)		
2. Fear of abandonment		
17(38.6)	8(72.7)	
25(45.5)		
2. Fear of abandonment		
17(38.6)	8(72.7)	
25(45.5)		
17(38.6)	8(72.7)	
25(45.5)		
8(72.7)	25(45.5)	
25(45.5)		
3. Fear of confidentiality		
13(29.5)	8(72.7)	
21(38.2)		
3. Fear of confidentiality		
13(29.5)	8(72.7)	
21(38.2)		
13(29.5)	8(72.7)	
21(38.2)		
8(72.7)	21(38.2)	
21(38.2)		
4. Client skill and psychological factor		
18(40.9)		
8(72.7)		
4. Client skill and psychological factor		
18(40.9)		
8(72.7)		
18(40.9)	8(72.7)	
8(72.7)		
26(47.3)		
5. Fear of accusation of infidelity		
0(0)	2(18.2)	
5. Fear of accusation of infidelity		
0(0)	2(18.2)	
0(0)	2(18.2)	
2(18.2)		
2(3.6)		

Outcomes of HIV sero-status disclosure to sexual partners

Neutral ☐ 77(25.5) ☐ 8(29.6) ☐ 85(25.8)
☐
2.
Neutral ☐ 77(25.5) ☐ 8(29.6) ☐ 85(25.8)
☐
77(25.5) ☐ 8(29.6) ☐ 85(25.8) ☐
8(29.6) ☐ 85(25.8) ☐
85(25.8) ☐
☐ 3. Increased
support ☐ 96(31.8) ☐ 8(29.6) ☐ 104(31.6) ☐
3. Increased
support ☐ 96(31.8) ☐ 8(29.6) ☐ 104(31.6) ☐
96(31.8) ☐ 8(29.6) ☐ 104(31.6) ☐
8(29.6) ☐ 104(31.6) ☐
104(31.6) ☐
☐ 4. Decide to be tested
☐ 123(40.7) ☐ 4 ☐ 13(48.1) ☐ 136(41.3) ☐
4. Decide to be tested
☐ 123(40.7) ☐ 4 ☐ 13(48.1) ☐ 136(41.3) ☐
123(40.7) ☐ 4 ☐ 13(48.1) ☐ 136(41.3) ☐
13(48.1) ☐ 136(41.3) ☐
136(41.3) ☐
☐ **Negative outcome**
☐ **179(59.3%)** ☐ **18(66.7)** ☐ **197(59.9)** ☐
Negative outcome
☐ **179(59.3%)** ☐ **18(66.7)** ☐ **197(59.9)** ☐
179(59.3%) ☐ **18(66.7)** ☐ **197(59.9)** ☐
18(66.7) ☐ **197(59.9)** ☐
197(59.9) ☐
☐ 1.
Abandonment ☐ 70(23.2) ☐ 11(40.7) ☐ 81(24.6) ☐
1.
Abandonment ☐ 70(23.2) ☐ 11(40.7) ☐ 81(24.6) ☐
70(23.2) ☐ 11(40.7) ☐ 81(24.6) ☐
11(40.7) ☐ 81(24.6) ☐
81(24.6) ☐
☐ 2.
Anger ☐ 164(54.3) ☐ 17(63) ☐ 181(55) ☐
2.
Anger ☐ 164(54.3) ☐ 17(63) ☐ 181(55) ☐
164(54.3) ☐ 17(63) ☐ 181(55) ☐
17(63) ☐ 181(55) ☐
181(55) ☐
☐ 3.
Blame ☐ 169(56) ☐ 18(66.7) ☐ 187(56.8) ☐
3.
Blame ☐ 169(56) ☐ 18(66.7) ☐ 187(56.8) ☐
☐

169(56)□18(66.7)□187(56.8)□
 18(66.7)□187(56.8)□
 187(56.8)□
 □4. Stigma and
 discrimination□79(26.2)□12(44.4)□9
 1(27.7)□
 4. Stigma and
 discrimination□79(26.2)□12(44.4)□9
 1(27.7)□
 79(26.2)□12(44.4)□91(27.7)□
 12(44.4)□91(27.7)□
 91(27.7)□
 □5.
 Violence□45(14.9)□7(25.9)□52(15.8
)□
 5.
 Violence□45(14.9)□7(25.9)□52(15.8
)□
 45(14.9)□7(25.9)□52(15.8)□
 7(25.9)□52(15.8)□
 52(15.8)□
 □6. Breakup in
 relationship□44(14.6)□3(11.1)□47(1
 4.3)□
 6. Breakup in
 relationship□44(14.6)□3(11.1)□47(1
 4.3)□
 44(14.6)□3(11.1)□47(14.3)□
 3(11.1)□47(14.3)□
 47(14.3)□

□ □
 □

Determinants of HIV positive status disclosure to sexual partners

Women who were cohabiting were less likely to disclose HIV positive status to sexual partner [AOR=0.158(0.04-0.598)]. Participants who did not know the HIV status of their sexual partners were less likely to disclose their HIV positive status [AOR =0.016(0.003-0.08)]. Women who had been on ARV treatment for more than one year were significantly more likely to disclose the HIV positive status to their regular partner [AOR=8.62(1.347-55.22)]. Being Illiterate, house wives and smooth relationship before HIV test, monthly income of ≤ 250 birr and those in relation with their partner for >2 years were significantly more likely to disclose their HIV positive status, according to the bivariate analysis result ,but this did not remain significant when controlled for other variables. No statistically significant association was observed in the other variables in relation to positive status disclosure (Table 4)

Table 4 Determinants of HIV positive status disclosure to regular sexual partner of women PLWHA attending ART clinic, Hawassa Referral Hospital, SNNPR, April 2008

Variable (n=346)	HIV disclosure Yes	status No	Crude OR (95%CI)	AOR (95%CI)**
Marital status				
Married	233	14	1.00	1.00
Cohabiting	27	19	0.09(0.04-0.20)*	0.158(0.04-0.598)*
Others	42	11	0.23(0.09-0.59)*	0.880(0.224-3.453)
Occupation				
Gov't employee	39	11	1.00	1.00
House wife	141	9	4.42(1.56-12.63)*	0.922(0.151-5.636)
Merchant	54	8	1.90(0.63-5.80)	1.036(0.204-5.270)
Others	68	16	1.20(0.46-3.08)	0.360(0.059-2.210)
Educational status				
Do not read and write	77	4	3.42(1.12-11.66)*	1.254(0.264-5.950)
Literate	225	40	1.00	1.00
Own monthly income(Birr)				
≤250	192	18	2.52(1.27-5.05)*	3.989(0.903-17.62.)
>250	110	26	1.00	1.00
Duration of relation with partner				
≤2year	42	22	0.16(0.08-0.34)*	0.598(0.187-1.918)
>2year	246	21	1.00	1.00
Knowledge of Partner status				
Yes	200	3	1.00	1.00
No	102	41	0.04(0.01-0.13)*	0.016(0.003-0.08)*
Relationship before test				
Smooth relation	270	32	1.00	1.00
With disagreement	32	12	0.32(0.14-0.72)*	0.391(0.109-1.395)
Duration since ARV started				
≤1 year	111	20	1.34(0.66-2.75)	1.243(0.432-3.582)
>1 year	100	2	12.09(2.64-76.59)*	8.62(1.347-55.22)*
Not started	91	22	1.00	1.00

* Statistically significant

** Adjusted for other variables

DISCUSSION

85.7% of the participants in this study disclosed their HIV positive status to sexual partners. The meta-analysis, shows that the developing countries disclosure rate was within the range of 16.7% to 86%. From the studies conducted in Mettu and Gore towns and Addis Ababa, St. Paul Hospital revealed disclosure rate of 69% and 92%, respectively (2, 5, 9). The rate of HIV positive status disclosure in this study was relatively higher than many studies. This could be explained by first, more than 90% of the participants were from urban area where access to HIV/AIDS information and services are abundant; the other explanation could be the relatively longer duration of diagnosis of the participants, which ranged from 1 month to 84months.

In this study, 14.3% of the women didn't make disclosure of HIV infection to others. Like many other studies both in developing and developed countries (2, 5) the main reasons for non disclosure reported also in this study were; fear of abandonment and stigma as well as client psychological factor. This study showed that only 30.6% of the women used condom always, and 67.9% of the respondents used condom during most recent sexual intercourse with their regular partners which is lower than results of other studies. The St. Paul Hospital studies Addis Ababa showed that 65.2% and 73.4% of the participants used condom always and during most recent sexual intercourse, respectively (9). Those couples with none or inconsistent condom use were at risk of HIV transmission of resistant viral strains and re-infection with new strains.

Unprotected sex also carries the risk of unwanted pregnancy and the subsequent risk of HIV transmission to children. This study showed considerable proportion of women get pregnant since they learned their HIV positive status, of which one fourth of the pregnancies were not intentional. This is an important reminder that emphasis should be given to involve partners and educating clients on the use of Condom in the prevention of unwanted pregnancy, re-infection, and transmission to partners as well as to child.

In this study, 40.7% of the participants reported positive partner reactions following disclosure. This finding is by far lower than other studies. The study in Gore and Mettu towns and Addis Ababa, St. Paul Hospital reported 75.9 % and 90% positive partner's reaction respectively (5, 9).

Most of the findings from studies of both developed and developing countries also showed that disclosure was not associated with the break-up of long-term relationships (2, 6, 7, 8). However, negative partner reaction following HIV status disclosure to sexual partner was reported by considerable proportion of woman (59.3%) in this study. The study

conducted in Gore and Mettu towns reported 24.1% negative outcomes following status disclosure (5).

Despite, most marriages survived disclosure in our study; significant number of women 14.3% reported that disclosure ended up in breaking sexual relation. This finding is nearly similar with study conducted in Tanzania, Kenya, and Trinidad, with findings of 27% of the women reported a break-up of a sexual relationship, and 5% reported a break-up in the marriage (10). This implies that with rapid scale up of VCT and PMTCT services in the region larger absolute numbers of women would be at risk of experiencing abuse and even violence. Therefore, mechanisms should be devised for identifying and supporting those women who are likely to experience negative outcomes while scaling up VCT services.

Similar to other findings (5, 9), in this study also married women were more likely to disclose HIV positive status to sexual partners. This could be due to intimacy, strength of their relationship, strong confidence and opportunities gained to raise issues related to HIV and test. Knowledge of partner HIV status was also found to be predictor of HIV positive status disclosure to regular sexual partner.

Consistent with other studies, women who had been on ARV treatment for more than one year was significantly more likely to disclose the HIV positive status to their regular partner. This could be explained by repeated counseling given for the patients in the ART clinic during follow up and treatment.

Unlike other studies (2, 5) no statistical association was observed between sex partners who hold prior discussions about HIV/VCT issues, age, own income, duration of test, education and HIV status disclosure. There are reports that HIV status disclosure to sexual partner is affected by multiple factors such as age, duration of relationship with sexual partner, education, socioeconomic status, level of education, culture, ethnic group, discussion on HIV and VCT prior to test, number of partner and partner involvement in the test (2, 5, 9).

STRENGTH AND LIMITATION OF THE STUDY

We used pre-tested and modified questionnaire for data collection. Female nurses working in the ART clinic were used to collect the data from all respondents so that confidentiality

could be reassured. But there might be social desirability bias due to the sensitive and personal questions related to sexuality.

CNCLUSION AND RECOMMENDATIONS

The study showed that those married, who knew more about partner's status and on ARV drug for >1year were more likely to disclose HIV positive status to sexual partners. Negative partner reaction following HIV positive status disclosure to sexual partner was reported by a relatively large proportion of women. Majority of the women were sexually active and considerable proportion of women were pregnant after learning their HIV positive status.

Emphasis should be given to couple counseling and testing and behavior rehearsal techniques in HIV testing and counseling programs in order to overcome the barriers to disclose their positive status. It is also important to facilitate positive outcomes and minimize negative outcomes. ART clinics should be linked with Reproductive Health services to address the sexual and reproductive health needs of PLWHA's with emphasis on Family Planning.

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THESIS-3

Assessment of Infant Feeding Practice of HIV Positive Mothers and HIV Status of their Infants in Addis Ababa

Yetayesh Maru

ABSTRACT

Background: Mother to child transmission (MTCT) can occur during pregnancy, at the time of delivery, and after birth through breastfeeding. Based on previous documented reports on MTCT, it is estimated that MTCT rates, without any anti-retroviral intervention is in the range of 15 to 30% while in the absence of breastfeeding ; when there is exclusive breastfeeding (0-6months) and prolonged feeding (18-24months) the chance of acquiring the disease is 25-35% and 30 - 45%, respectively.

Objective: To Assess the Infant Feeding Practice of HIV Positive Mothers and examine HIV prevalence of their infants.

Methods: A cross sectional study conducted in 5 hospitals and 8 health centers with ART and PMTCT facilities. The study participants were purposively selected from Addis Ababa during March 1- 30, 2008. A total of 327 women living with HIV having (infants less than 12 months) and visiting health institutions were recruited and assessed for their infant feeding practices and HIV status of their children.

Results: Of the 327 subjects, the proportion of mothers who experienced ERF, EBF and mixed feedings were 46.8%, 30.6%, 15.3%, respectively. A range of social and obstetrics factors such as disclosure status of subjects to spouse and mode of delivery were noted to have significant association with ERF practicing. Mode of delivery was predicting factor for EBF and disclosure status of HIV to spouse, Attitude towards infant feeding and infant illness were examined as factors of mixed feeding. Among the infants (n=208) who were examined for their HIV status, 9.1% of them were positive. Interestingly, the proportion of infants whose HIV result was positive was significantly higher among the infants practicing mixed feeding. When EBF was compared with ERF, there was no significant differences noted between them.

Conclusion: The study showed that ERF and EBF were common infant feeding practices where no distinct difference on HIV status of infants was observed between EBF and ERF. However, it is concluded that mixed feeding has significantly higher risk.

Recommendation: involvement of spouses is crucial to make mothers to stick to safer feeding option and Option of C/S delivery should be given for HIV positive mothers in all health institution. Efforts also should be made to alleviate the problem of social stigma that helps mother to choose safer infant feeding option through various available media.

INTRODUCTION

Background: According to the 2007 AIDS epidemic update, 33.2 million people are estimated to be living with HIV with 2.5 million new infections. More than two third (68%) of adults and nearly 90% of children infected with HIV live in Sub-Saharan Africa and more than three fourth (76%) AIDS deaths in 2007 occurred there. According to calibrated single point estimates (2007), the national adult prevalence is reported to be 2.1 %. Around 977,394 Ethiopians are living with HIV/AIDS. Mother to child transmission (MTCT) can occur during pregnancy, at the time of delivery, and after birth through breastfeeding. Based on previous documented reports on MTCT, it is estimated that MTCT rates, without any anti-retroviral intervention is in the range of 15 to 30% while in the absence of breastfeeding; when there is exclusive breastfeeding (0-6months) and prolonged feeding (18-24months), the chance of acquiring the disease is 25-35% and 30 to 45% respectively. (1, 2, 3)

Statement of the problem

Mother to child transmission (MTCT) is the most common mode of HIV transmission in children. Of the ten countries worldwide with the greatest number of infected children, the top nine are all in sub-Saharan Africa. Cohort study conducted in Ethiopia estimated that the rate of MTCT in Ethiopia is in the range of 29%-47 % (4). The balance between BF life saving benefits and the risk of transmission complicates infant feedings in communities affected by HIV. In Ethiopia, infant feeding practice of mothers of unknown HIV status is assessed. However, there is still a gap in assessment of HIV positive mothers in relation to mother to child transmission risk and associated factor. Therefore, this study is proposed to fill this gap.

GENERAL OBJECTIVES

To Assess infant feeding practice of HIV positive mothers and their infants HIV status in Addis Ababa PMTCT, ART sites and child follow up clinics.

METHODS

Background information of study Area – The study was conducted in Addis Ababa, the capital city of Ethiopia. It has an area of 450 square kilometer with an estimated population of 3.5 million. In the city; there are 36 hospitals (13 owned by Government), 27 health centers (24 Owned by Government), 450 clinics. The city is composed of 10 sub-cities (kifle ketema) consisting of 100 kebeles. (21)

Study design: Facility based cross sectional, descriptive study and analytic in nature.

Source population: All reproductive age (15-49 yrs) of women living with HIV/AIDS in Addis Ababa.

Study subject: women living with HIV/AIDS and having HIV exposed child less than 12 months and visiting health institutions during the study period

Study period: The study was conducted during the month of March, 2008

Sample size determination: using the formula for single population proportion and prevalence of 50% was taken with 95 % confident interval and 5% precision (marginal error), a non-response rate of 5% using the following formula.

$$n_0 = \frac{(Z_{\alpha/2})^2 P (1-P)}{d^2}$$

n_0 = the sample from an infinite population

P= the prevalence of HIV among mothers who give live births

d= marginal error between the sample and the population (0.05)

Z= Critical value at 95% certainty (1.96)

$$\Rightarrow (1.96)^2 (0.5)(0.5) / (0.05)^2$$

$$n_0 \Rightarrow 384$$

The total estimated number of HIV positive mothers who give live births was 2000. Therefore, finite population correction formula was applied

$$n = \frac{n_0}{(1 + n_0/N)}$$

Where

$n \Rightarrow$ The required sample size

$N \Rightarrow$ total population

$n \Rightarrow 322 + 16(5\% \text{ non-response rate}) \Rightarrow 338$ needed

Sampling Procedure: government institutions were purposively selected since PMTCT services were mainly provided by them. Institutions with PMTCT and ART services again purposively selected and five hospitals and eight health centers were purposively selected according to client flow. Finally, data collection was held in order of arrival of clients.

Data collection procedure

For quantitative data : a pre-tested questioner was used. 13 Nurses and 3 Health officers were recruited from all the health institutions and all the data collectors were trained on data collection techniques. Data was collected by the trained nurses and health officers under close supervision of the principal investigator. Records were also reviewed to know the HIV status of infants immediately after filling of questioner.

For qualitative data : Key-informant interview was conducted from 13 health institutions by selection of key informants who were working in PMTCT units by the principal investigator by using semi structured questioner which adopted from different researches. Focus group discussions were held from three separate health institutions, each FGD comprised of 6-8 eligible subjects after random selection from 4 mother to mother support groups. Subjects were included in the discussion and interview after the principal investigator informed about the purpose of the study. In the discussion, tape recording and notes were taken.

Data quality control: Supervision was made frequently by the three supervisors together with the principal investigator for data quality and completeness. Each questioner was checked for completeness of the information collected from each subject. Probing questions were asked to reduce error arising from respondents memory lapse and data entered was rechecked in 10% of randomly selected subjects.

Inclusion criteria: Mothers living with HIV/AIDS and gave birth for the last 12 months who visited ART and child follow up clinic.

Exclusion criteria: Guardians with infant less than 12 months old.

Data analysis technique: Pre- coded data was entered and cleaned using Epi Info version 3.3.2. The data was exported to SPSS software version 11 and analyzed. Bivariate and multivariate analysis was employed and Sum score and multiple response analysis was applied for knowledge and attitude measures. The qualitative data was recorded using tape recorder and transcribed, translated and then triangulated with the quantitative information for discussion.

Variables

Dependent variable: Exclusive replacement feeding (ERF), exclusive breast feeding(EBF), mixed feeding(MF) and HIV status of their infants.

Independent variable: Socio demographic variable, obstetric history, maternal health, infant health, awareness about feeding option, knowledge of PMTCT and MTCT , attitudes towards infant feeding and cessation of breast feeding(CBF).

Ethical consideration: The study was approved by the ethical review committee of the AAU, and AA Health Bureau. After getting clearance, all the selected hospitals and health centers were adequately communicated. Written consent was obtained from the study subjects after the nature of the study was briefed in their local language. Informed verbal consent from key informants and focus group discussants was obtained. The interviews with study subjects were held in private and confidential setting and the right of the respondents to refuse at anytime was respected

RESULTS

From the total 338 subjects enrolled, only 327 subjects participated in this study making the response rate of 96.7%.

Socio – demographic characteristics of study participants: the majority of the participants 225(68.8%) were in the age group of 25-34 years with a median age of 27. Most of them 266(81.3%) were married with educational status of secondary school 112(34.3%). Over three quarter 266 (81.3%) were Orthodox Christian and slightly greater than half 171 (52.3%) were of Amhara ethnic groups. The majority 222 (67.9%) of mothers were house wives and almost half of spouses' educational status and occupation fall under secondary school and private job,123(45.9%) and 126(47.0%) respectively. The household monthly income of less than 500 birr per month was reported by 210(64.2%) subjects.

Obstetric History: From all participants, 94.2% were attending antenatal follow up in the first and second trimester period, 36.7% and 47.7% respectively. Majority (67.9%) were delivered at Government hospitals followed by Government HCs (21.4%). A large proportion was delivered by SVD (69.4%), C/S (16.5%), and Episiotomy (13.1%). 85.9% of infants and 79.2% of mothers had taken ARV prophylaxis (Nevirapine)

Demographic characteristics and HIV test status of infants

Out of all Infant's of HIV positive mothers, 27.2%, \leq were 3 months, 26.6% 4-6 months and 46.2% \geq 7 months-of age. Almost half (48.4%) were females and more than half (52.9%) were tested at the age of \leq 3 months and the median Age of HIV testing was 3 months. Among all infants, 208(63.6%)were tested for HIV. The 59.9% and 56.6% of the study participants had sufficient knowledge of MTCT and PMTCT respectively. The majority of study participants, (93.9%) had awareness on infant feeding options of HIV positive mothers. In this study, 87.2% of the subjects were tested for HIV during their current pregnancy and delivery and more than one third of the study subjects (46%) did not disclose their HIV status to spouse.

Infant feeding practice: Table1 shows the infant feeding practice of the study participants. Out of 327 study subjects, 153(46.8%) practiced Exclusive replacement feeding, 100(30.6%) exclusive breast feeding, 50(15.3%) mixed feeding and 24(7.3%) breast feeding followed by replacement feeding. Wet nursing was ever practiced in 1 of the respondents (0.3%) and ever expressed breast feeding was practiced by 14(4.3%) of whom 5(35.7%) treated it with heat. Among mothers practicing mixed feeding, the commonest reasons were; advised by neighbors 20(40%), insufficient breast milk 13(26%), advised by husband 7(14%), mother illness 4(8%), infant illness 3(6.0%) and both mother and infant illness 3(6%). The distribution of type of replacement feeding affirmed by study subjects was infant formula 90(50.8%), cow's milk 35(19.8%) and both infant formula and cow milk alternatively 52(29.4%)

Table 1: infant feeding practice of HIV positive mothers, Addis Ababa, March 2008

Variables	Level	N	%
Type of feeding	ERF	153	46.8
	EBF	100	30.6
	Mixed feeding	50	15.3
	BF to RF	24	7.3
	Ever expressed feeding	14	4.3
	Ever wet nursing	1	0.3
Heat treated	Yes	5	35.7
Expressed milk	No	9	64.3
Reason of mixed	Advised by neighbors	20	40

	feeding	Insufficient breast milk	13	26
		Advised by husband	7	14
		Mother illness	4	8
		Infant illness	3	6
		Both mother and infant illness	3	6
	Type of replacement feeding	Infant formula	90	50.8
		Cow's milk	35	19.8
		Both alternatively	52	29.4

Among 174 mothers who ever breast fed, 66(37.9%) were completely stopped breast feeding. Time of cessation was at the age of less than 7 days 6 (9%), 8-30 days 8(12.1%), 2-3months 12(18.2%), 4-6 months 37(56.1%) and greater than 6 months 3(4.5%).

Maternal and infant Health: Out of 327 respondents, 25 (7.6%) had breast and nipple related problem and 36 (11%) had other health problems. Quarter of mothers 6 (24%) reported to change their infant feeding method when they had breast related illness. Among 327 respondents, 138(42.2) reported that infants had at least one illness since birth and 72(52.5%) of them were among ever breast fed infants and 66(47.8%) from never breast fed infants.

Association of infant feeding practices with socio- demographic, obstetric and knowledge of PMTCT, MTCT and infant feeding option

Mode of delivery and disclosure of HIV status to spouse had statistically significant association with ERF practice. Mothers who delivered by C/S were 4.1 times more likely to practice ERF than those who delivered at home (**OR, 4.1, 95% CI (1.7-10.2)**). Subjects who disclosed their HIV status to spouses were 3.8 times more likely to practice ERF than those who didn't . (**OR, 3.8, 95%CI 1.9-7.1**)

Table 2- Socio- demographic, obstetric and knowledge and attitude association with practicing exclusive replacement feeding among HIV positive mothers, Addis Ababa, March 2008

Variable	Level	ERF N(%)	COR(95% CI)	AOR(95%CI)
education of SS	Illiterate	18(27.70)	1	1
	Read and write	9(37.50)	1.57(0.58,4.21)	1.1(0.3,4.2)
	1-8 grade	39(41.10)	1.82(0.92,3.59)	0.9(0.3,2.3)
	9-10+2	63(56.30)	3.36(1.74,6.49)	0.9(0.3,2.5)
	10+2 & above	24(74.20)	** 7.51(2.84,19.82) **	1.3(0.3,4.8)
education of spouse	Illiterate	3(23.10)	1	1
	Read and write	4(21.10)	0.89(0.16,4.85)	0.3(0.0,2.3)

	1-8 grade 9-10+2 10+2 & above	21(38.90) 67(53.70) 37(62.70)	2.12(0.52,8.6) 3.86(1.01,14.71) * 5.61(1.39,22.59) **	0.7(0.1,3.9) 1.4(0.3,7.5) 1.1(0.2,6.9)
Household income	≤500 birr 501-1000 birr ≥1001 birr	81(38.60) 54(56.40) 18(78.30)	1 2.06(1.26,3.37)** 5.73(2.05,16.04)**	1 1.8(0.9,3.6) 1.9(0.5,7.3)
place of delivery	At home Private hospital Private clinic Government HC Government Hospital	4(16.70) 4(57.10) 2(50.00) 19(27.10) 124(55.40)	1 4.67(1.06,42.06)* 4.99(0.54,46.71) 1.86(0.56,6.16) 6.21(2.06,18.76)**	1 1.1(0.1,16.9) 2.5(0.1,54) 0.4(0.1,2.2) 0.9(0.2,5.4)
Mode of delivery	SVD C/S Episiotomy Others	89(39.2) 44(81.50) 19(44.20) 1(33.30)	1 6.95(3.33,14.52)** 1.25(0.65,2.42) 0.79(0.07,8.84)	1 4.1(1.7, 10.2)* 1.0(0.4,2.4) 0.5(0.0, 7.2)
Disclosure of HIV status to spouse	No Yes	47(31.3) 105(59.30)	1 3.46(2.14,5.62)**	1 3.8(1.9, 7.1)**

As shown table 3 below, Mode of delivery was the predicting factors of EBF. Mothers who delivered by C/S were 80% less likely to practice EBF than those who delivered by SVD. **(OR, 0.2, 95%CI, 0.1-0.7)**

Table 3- Socio- demographic, obstetric and knowledge and attitude association with practicing exclusive breast feeding among HIV positive mothers, Addis Ababa, March 2008

Variable	Level	EBF N(%)	COR(95% CI)	AOR(95%CI)
education of SS	Illiterate	27(41.5)	1	1
	Read and write	8(33.3)	0.70(0.26,1.88)	0.6(0.1,2.1)
	1-8 grade	36(37.9)	0.86(0.45,1.64)	1.1(0.4,2.9)
	9-10+2	27(24.1)	0.45(0.23,0.86)*	0.8(0.3,2.1)
	10+2 & above	2(6.5)	0.15(0.04,0.55)**	0.6(0.1,2.8)
education of spouse	Illiterate	9(69.2)	1	1
	Read and write	12(63.2)	0.76(0.17,3.42)	0.8(0.2,4.4)
	1-8 grade	19(35.2)	0.24(0.07,0.89)*	0.3(0.1,1.6)
	9-10+2	29(23.6)	0.14(0.04,0.50)*	0.2(0.1,1.0)
	10+2 & above	12(20.3)	0.11(0.03,0.43)**	0.2(0.0,1.2)
Occupation of SS	House wife	73(32.9)	1	1
	Private employee	13(33.3)	1.0(0.49,2.06)	1.1(0.4,3.1)
	Government employee	0	0.01(0.0,1.1E+07)	0.0(0.0,1.E+13)
	Daily laborer	6(26.1)	0.7(0.3,1.9)	0.2(0.0,1.4)
	Others	8(24.2)	0.6(0.3,1.5)	0.6(0.3,1.1)
Household income	<=500 birr	76(36.2)	1	1
	501-1000 birr	22(23.4)	0.57(0.33,0.99)*	0.7(0.3,1.5)
	>=1001 birr	2(8.7)	0.17(0.04,0.74)*	0.5(0.1,2.9)
Mode of delivery	SVD	80(35.2)	1	1
	C/S	4(7.4)	0.14(0.05,0.41)**	0.2(0.1,0.7)*
	Episiotomy	15(34.9)	0.97(0.49,1.91)	1.1(0.5,2.7)

	Others	1(33.3)	0.90(0.08,10.09)	0.9(0.1,13.9)
Knowledge of PMTCT	Insufficient	53(37.3)	1	1
	Sufficient	47(25.4)	0.59(0.37,0.94)*	0.6(0.3,1.2)

As shown in table 4, disclosure of HIV status to spouse, attitude towards infant feeding and infant illness were factors for mixed feeding. Mothers who disclosed their HIV status to spouse were 84% less likely to practice mixed feeding than those who didn't. (**OR, 0.11, 95%CI, 0.04-0.3**). Mothers who had experiences of infant illness were 2.3 times more likely to practice mixed feeding than mothers who had no experiences of infant illness. (**OR, 2.3, 95%CI, 1.0-5.0**). Mothers who had positive attitude towards infant feeding were 69% less likely to practice mixed feeding than those who didn't have. (**OR, 0.31, 95%CI, 0.1-0.8**).

Table 4- Socio- demographic, obstetric and knowledge and attitude association with practicing mixed feeding among HIV positive mothers, Addis Ababa, March 2008

Variable	Level	Mixed feeding N (%)	COR(95% CI)	AOR(95%CI)
Education of SS	Illiterate	17(26.2)	1	1
	Read and write	4(16.7)	0.56(0.17,1.89)	1.1(0.3,4.6)
	1-8 grade	15(15.8)	0.53(0.24,1.16)	0.8(0.3,2.3)
	9-10+2	11(9.8)	0.31(0.13,0.71)**	0.8(0.3,2.2)
	10+2 & above	3(9.7)	0.30(0.08,1.12)	0.8(0.1,5.3)
Occupation of SS	House wife	27(12.2)	1	1
	Private	6(15.4)	1.3(0.50,3.40)	0.9(0.3,3.3)
	employee	7(30.4)	3.16(1.19,8.38)*	1.5(0.4,5.7)
	Daily laborer	1(20.0)	1.81(0.19,16.76)	6.4(0.3,1.48)
	Merchant	4(21.1)	1.93(0.59,6.23)	2.3(0.4,12.9)
Place of delivery	Others			
	At home	11(45.8)	1	1
	Private	1(14.3)	0.19(0.02,1.89)	0.2(0.0,3.1)
	hospital	10(14.3)	0.19(0.07,0.56)**	0.2(0.1,1.1)
	Government HC	28(12.6)	0.17(0.07,0.42)**	0.3(0.1,1.1)
Disclosure of HIV status to spouse	Government hospital			
	No	40(26.7)	1	1
Attitude about infant feeding	Yes	10(5.6)	0.16(0.08,0.33)**	0.11(0.04,0.3)**
	Negative	13(31.0)	1	1
Maternal illness	Positive	37(13.0)	0.33(0.16,0.69)**	0.31(0.1,0.8)*
	No	33(12.4)	1	1
Infant illness	Yes	17(27.9)	2.73(1.39,5.32)**	2.2(0.9,5.4)
	No	22(11.7)	1	1
Infant illness	Yes	28(20.4)	1.94(1.06,3.56)**	2.3(1.0,5.0)*
	No			

As table 4 below, when variables were adjusted for possible confounders, only mixed feeding was factor of HIV positive status of infants. Infants who got mixed feeding were 6 times more likely to be HIV positive than those who got ERF and EBF, respectively (**OR, 6.1, 95%CI, 1.4-25.7**).

Table 5: Factors associated with HIV Positive results of infants, Addis Ababa, March 2008

Variable	Level	HIV positive N (%)	COR(95% CI)	AOR(95%CI)
Feeding Type	ERF	4(4.1)	+1	1
	EBF	5(8.1)	2.06(0.53,7.99)	2.1(0.5,8.5)
	Mixed	9(32.1)	11.13(3.11,39.9)**	6.1(1.4,25.7)*
	BF to RF	1(5.0)	1.24(0.13,11.69)	1.11(0.11,10.30)
Maternal breast related problem	No	15(7.8)	+1	1
	Yes	4(25.0)	6.31(2.18,18.26)**	1.34((0.3,5.7)
Infant received ARV prophylaxis	No	9(25.7)	1	1
	Yes	10(5.8)	0.18(0.07,0.48)**	0.56(0.14,2.2)
Mother taken ARV prophylaxis	No	10(22.7)	1	1
	Yes	9(5.5)	0.19(0.08,0.52)**	0.4(0.11,1.43)

Qualitative Methods

Key informant interview: All counselors said that in PMTCT sites, infant feeding counseling was given during antenatal examination, pre-test and post test counseling, during delivery and post natal and follows up of HIV exposed infants. Some of the counselors stated that In PMTCT sites, only exclusive breast feeding as infant feeding options are offered for HIV positive women. However some of the counselors' advice formula and modified animal milk is an alternative. All counselors confirmed that mothers are not shown and also demonstrated how to prepare formula or modified animal milk. The majority of counselors reported that the greatest challenge in counseling women on infant feeding option is Identifying AFASS criteria.

A 30 year female counselors said that "what I usually focus is, only on affordability issue of the infant formula. Identifying AFASS criteria are challenging for me, I have estimated the amount of infant formula which will be consumed by a child and its cost per tin. I tried to assess the affordability to buy the calculated amount of the formula or cow milk per month. If a mother says "i can afford it", she can choose exclusive replacement feeding, if she can't, I advice her to choose exclusive breast feeding."

The majority of counselors said that almost half of women return for regular follow up visits postpartum. The postpartum follow up schedule of most health institutions are visited in 7 days and 45 days after delivery. Most of counselors explained that, HIV positive women have the same follow up schedule as HIV negative women or women of unknown status in postpartum. To improve infant feeding practice, all counselors pointed out the need for economic support as well as psychological, social, and husband support to make the ongoing PMTCT program effective. Efforts should be made to involve husbands in the program and health workers should be updated on recent information to create awareness in the community.

A 30 years female counselor stated that “women don’t want to come with their husbands for counseling, husbands also refuse to come. We were inviting spouse and counseled them on different issue of HIV/AIDS. Finally after being tested, some couples get divorced, but some couples maintained helping one another”

Focus group discussion of HIV positive mothers: Majority of respondents said that, mothers who selected replacement feeding don’t consider first about the stigma with HIV and they go on choosing replacement feeding. However, when they come to practice, other body or family members need them practicing breast feeding, members start asking them why not breast feeding and insist the mother to BF the child, and advise them to give liquid. Because of the external factors, mothers are giving breast milk in their presence, or give liquid like tea; water with sugar, and water with *Tenadam* (Rul) and *Abish* (tenugneck) to pretend that they are not HIV positive. A 30 years old mother living with HIV said the following;

“I fed my child breast milk because my husband is not aware of my HIV status. Because of hiding my HIV status from my husband, I faced several problems. To mention a few, my husband was buying formula milk to the new born and insisted to give the child the formula milk. At the age of 6 months I stopped breast feeding and changed to cow milk. Again my husband asked me why I gave the child only cow milk; he said the child should get breast milk until 2 years. Then I replied that the health professionals warn me about breast milk. They told me that my breast has the sign of cancer and better to stop breast feeding as early as possible.”

On the bases of FGD session, most mothers do not disclose their results to their spouses. The reason of fearing divorce and being challenged to raise the child alone. The majority of the respondents said that, mothers don’t want to discuss about HIV testing and condom usage in front of their husbands. If so, it could raise a question of why? If she happens to

disclose the result to her husband, the husband will blame her and even will tell her that she acquired the disease from other person even if the husband is tested positive. A 32 years old mother expressed her feeling as follows:

"I know a mother who knew her HIV status during her antenatal follow up. The day the mother was tested positive; she disclosed her HIV status to her spouse. The husband reacts negatively and left her alone in the house with no support where she was in need of help. She delivered in the house unassisted, and managed to cut the cord by herself."

DISCUSSION

The present study has tried to assess the infant feeding practice of HIV positive mothers and their infants HIV status.

Infant feeding adherence: Infant feeding recommendations for HIV positive mothers must take into account the local environment and conditions to provide the most accurate information on risks and benefits of breast-feeding and replacement feeding. In this study, nearly half of the subjects were noted to practicing ERF (46.8%) and slightly greater than a quarter of mothers living with HIV practiced EBF (30.6%). This finding concurs with the earlier studies done, in Zambia, which showed that most HIV positive mothers decided replacement feeding and (30-40%) practiced exclusive breast feeding. (4)

Even if heat treated expressed milk and wet nursing are feeding options of HIV positive mothers only 14 and 1 study participants were ever practicing expressed breast milk and wet nursing, respectively. From key informant interview report it was found that, only replacement feeding and exclusive breast feeding were given as feeding options of HIV positive mothers by counselors. In addition, expressed breast milk was used by mothers for transition period from breast milk to complementary food. According to the WHO guideline, the inclusion of any feeding in addition to breast-milk into the diet (with the exclusion of medicines) constitutes mixed feeding. The proportion of mixed feeding in this study was 15.3%. This proportion is much higher than the Cameroon report (4.3%) and lower than the study from India (29%). mixed feeding was associated with disclosure of HIV status to spouse, attitude towards infant feeding and infant illness. (3)

Mothers who disclosed their HIV status and had positive attitude towards infant feeding were less likely to practice mixed feeding. Mothers who had experience of infant illness were more likely to practice mixed feeding. According to the qualitative finding, Women face increasing pressure from family members to introduce other liquids, and a lack of

disclosure makes resistance difficult to such pressures. In this case, mothers would give extra fluid or milk due to fear of , being suspected as HIV positive by the community. Subjects who delivered by C/S were more likely to practice replacement feeding, while subjects delivered with cesarean section were less likely to use breast feeding. The finding from qualitative study also confirmed that option was given in some of the health institutions for HIV positive mothers either to deliver by cesarean section and choose replacement feeding or spontaneous vertex delivery and choose breast feeding. Mothers who disclosed their HIV status to spouse were more likely to practice exclusive replacement feeding. This finding conformed to the findings of previous studies that documented in India; (6). It is recommended that early cessation of breast feeding is important to minimize HIV transmission. In this study, more than half of the participants stop breast feeding within 4-6 months of child age. This was as advised by health workers serving in PMTCT sites.

HIV prevalence of infants: Mother to child transmission is one of the major sources of HIV infection in children. In this study, only two third of infants have been tested for HIV and 9.1% of them tested positive. The type of test used was DNA PCR. The prevalence is much lower than the cohort study conducted in Ethiopia which estimated HIV transmission risk from 29-47% for Ethiopia (7). The prevalence may be under estimated in this study since the finding did not include; infants who have not been tested for HIV, still births and infant deaths and those who didn't utilize health services. Besides, the low prevalence may be due to; widening of PMTCT services, ARV prophylaxis for infants and mothers, ART accessibility for eligible mothers and different prevention methods.

HIV transmits from mother to child through breast-feeding. A study conducted in Kenya revealed that the transmission is high among infants feeding breast milk than replacement feeding and there is high risk in mixed feeding. On the other hand, a study done in Durban-South Africa revealed that exclusive breast-feeding at 3 months was an equivalent risk to no breast feeding. In this study, Mothers who practiced mixed feeding had higher rate of HIV positive infants. However, there was no significant difference in HIV status between infants who had history of exclusive breast feeding at most 6 months and infants taking exclusive replacement feeding. This may be due to small number of HIV positive samples and methodological differences even though the finding is similar with that of South Africa's findings. The median age of infants during HIV test in this study was 3 months. (5,9)

Disclosure of HIV status to spouse and role of spouse: Current strategy to reduce mother to child transmission is efforts made to voluntary HIV counseling and testing to all

pregnant during the antenatal period. In this study, the majority (87.2%) of the study subjects were tested for HIV during their current pregnancy and delivery periods. However, it was reported that majority of the women in the study decided and accepted HIV testing alone. The current HIV testing practice usually involves counseling and testing of pregnant women alone. From counselors report in key informant interview, efforts were made in couples counseling and testing .However, many mothers do not come with their husbands due to husbands' refusal to come. Among couples who came for counseling and testing, some divorced after being tested positive while there were couples who maintained their relationships after the positive result. In this study, more than one third of mothers (42%) didn't disclose their HIV status to spouse. Findings obtained from the qualitative study showed that, fear of adverse social outcomes like divorce. In addition to the low economic status and dependence on their husbands, divorce that leads women to raise the child alone worsens the life of women. The finding of this study is similar with a study conducted in Australia. It was expressed that large numbers of women tested for HIV during pregnancy did not revile their being tested to their husbands. In addition, earlier studies also suggested that lack of support from male partners impedes HIV counseling and testing as well as the uptake of treatment to prevent MTCT of HIV (8, 10).

STRENGTHES OF THE STUDY

It is a useful foundation to serve as a base line for further research in the area.

LIMITATION OF THE STUDY

Since it is non probability sampling, It is not possible to generalize for the whole population, Recall biases are there since the study assessed dietary recall starting from birth. In this study, majority of the study subjects practiced exclusive replacement feeding. This may not take into account the local environment and conditions in relation to morbidity and mortality resulting from replacement feeding. In addition, it may not consider affordability and cultural acceptability of the feeding options.

CONCLUSIONS

High proportion of mixed feeding was observed in this study. Women face increasing pressure from family members to introduce other liquids, and a lack of disclosure makes resistance difficult to such pressures. Even though there were small number of HIV positive infants, there was high risk of HIV transmission in mixed feeding and there was no significant difference between EBF and ERF.

RCOMMENDATIONS

1. Involvement of spouses is crucial to make mothers to stick to safer feeding option;
2. Efforts should be done to support HIV positive women and involve them in income generating activities to enable them to earn income to cover their living costs;
3. Option of C/S delivery should be given for HIV positive mothers in all health institutions;
4. Efforts should be made to alleviate the problem of social stigma to help mothers to choose safer infant feeding option through various available means;

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THESIS-FOUR

Median Age and Determinants of Sexual Initiation among Youth in North East Ethiopia

Fekadu Mazengia

ABSTRACT

Background: The very low level of economic development, widespread poverty, very poor and inadequate health services, etc., make consequences of youth sexuality much more serious in Ethiopia than those in developed countries. It is crucial to understand determinants and contextual factors of early sexual initiation in a broader context for designing and implementing effective interventions targeting youth.

Objectives: The aim of this study therefore is to examine the median age and various paths of commencement of the first sex for rural and urban youths.

Methods: A comparative cross sectional study was conducted between, March 1st -15th in Dessie town and Dessie Zuria Woreda. To draw a total sample size of 1294 (647 urban and 647 rural), a multistage cluster sampling was used. To collect quantitative data semi-structured, pretested questionnaire was used, while for qualitative FGD was applied. Eight Trained data collectors and two supervisors collected the data. Data entered and analyzed using EPI INFO Version 2000 and SPSS for Windows Version 15.0. Univariate and multivariate analysis were used.

Result: About half, (51.3%) of the surveyed youths nearly in equal proportion between rural and urban have ever had sex. The Mean & median age of sexual initiation were 16.8 years (SD= 2.25) and 17 years respectively (Range 8-24 years). Rural youths initiate sex at lower age mean and median (16.49±2.11) and 16.00 compared to their urban counterparts with mean and median (17.18±2.32) and 17.00 respectively the hazard was significant (AHR [95% CI] =1.45 (1.19, 2.55 or the probability of rural youths to initiate early was 60 % (54 %, 71%)). Multivariate analysis show that female by gender OR [95%CI]=1.56(1.11,2.19), chew Khat (adj. OR [CI] = 2.05 [1.05–3.96]), who drink alcohol (adj OR [CI] = 2.05 [1.05–3.96]), who viewed pornographic materials < 18 years Adj OR= 24.133 (3.28, 177.80) and less connected with parents adj. OR=2.30(1.35,

3.91) were more likely to have early sexual initiation. Logistic analysis to see the impact of early sexual initiation showed that early initiators were more likely to be exposed to STIs & multiple partnership than late initiators [adj OR 95%CI] = 2.08(1.17, 3.72) and [adj OR (95%CI) = 2.33(1.61, 3.37)] respectively.

Conclusion and Recommendation: Early sexual initiation was prevalent and mostly unexpected and unprotected. Those who initiate early were more likely to have bad reproductive outcomes and risky behaviors. In all aspects the problem prevails in rural youths than urban. Delaying sexual debut is the pillar of HIV & other STIs prevention among youths. This can be achieved through starting well designed sexual education programs at earlier life. Strengthening the norm of virginity should be advocated. virginity should be sought for those who already initiated ways to access condoms and other contraceptives specially to rural youths should be sought.

INTRODUCTION

Meeting the needs of youth today is critical for a wide range of policies and programs, because the actions of young people will shape the size, health, and prosperity of the world's future population. WHO classifies youth in between the age range of 15-24 years. More than 1 billion people in the world are within this age, and most live in developing countries (1,).

Early sexual debut increases young peoples' risk for infection with HIV and other STIs. Youth who begin sexual activity early are more likely to have high-risk or multiple partners and are less likely to use condoms. Early childbearing has been linked to higher rates of maternal and child morbidity and mortality, truncated educational opportunities, and lower future family income, larger completed family sizes, which in turn may lead to greater population growth (2,3). One in every 10 births and one in 10 abortions worldwide and 1 in 6 births in developing countries is to women age 15-19 years. Each day half a million young people are infected with a sexually transmitted disease and 7,000 young people become infected with HIV every day (1, 4).

According to EDHS 2005; among women age 25-49 years, 32 % had sexual intercourse before age 15, and 65 % before age 18 years. In Ethiopia, trends in sexual initiation have changed little between 2000 and 2005 according to EDHS (2). The 2007 Epidemiological Synthesis study found that young population, specially never-married sexually-active females carry the greatest risk of HIV infection in the country. Their prevalence rates are

much higher than the average for both urban and rural areas .Girls are in greater risk at early ages because of both biological and cultural factors (5).

The very low level of economic development, widespread poverty, very poor and inadequate health services, etc., make the consequences of adolescent sexuality much more serious in the Ethiopian context than those in developed countries (1,5). The aim of this study therefore is to examine the various paths of the commencement of first sex.

OBJECTIVES

General Objective

To determine median age of first sexual intercourse and the determinants of sexual initiation among rural and urban youths (age 15- 24 years) in Dessie town and Dessie Zuria rural Woreda.

Specific Objectives

1. To determine median age at first sexual intercourse.
2. To identify factors that determines age at first sexual intercourse.
3. To explore the impact of early sexual initiation on reproductive health problems of adolescents and young adults.

METHODOLOGY

A comparative analytical cross sectional study supplemented by FGD was conducted in Dessie Town and Dessie Zuria rural Woreda in North Eastern part of Ethiopia, between March 1 - March 15, 2008. Dessie is located 400 Km away to the north of Addis Ababa. The population of the town, in 2007 was estimated to be 177,116. Youths (age group 15-24) are estimated to be 39,600 (22 %) of the total population. Dessie Zuria rural Woreda has 31 rural Kebles and the total population in June 2007 was estimated to be 278,725.

A sample size was obtained using sample size calculation for comparative cross-sectional study and based on the following formula .Residence being urban or rural is considered as main determinant for early sexual initiation and used for sample size determination.

$$n = \frac{\left[Z_{\alpha/2} \sqrt{\left(1 + \frac{1}{r}\right) R(1-P) + Z_{\beta/2} \sqrt{R(1-P) + \frac{R(1-P)}{r}}} \right]^2}{(R-P)^2}$$

Allowing a contingency for non-response (a rate of 10%) and a design effect of 1.5, the final sample size was 1294 (647 urban and 647 rural young adults).

A multistage cluster sampling was used in the study. After the first household has been identified of 12 Kebeles (6 urban Kebeles and 6 rural Kebeles) respectively were randomly selected by lottery method. Each kebele has around 5000 population in approximately 1000 households. From each Kebele 108 households were selected. Each rural Kebele is organized into 6 sub units called villages or *Gots* and *Ketenas* for urban Kebeles. To select the households going to the center of the village (Got/Ketana) spinned a bottle and then every 10th households (random walk method) were interviewed.

The instrument is derived from standard data collection tools prepared by FHI & WHO. It was first prepared in English, translated to Amharic and back to English again. There were 2 supervisors and eight data collectors were assigned. The interviewers were the same gender in order to decrease embarrassment as some of the questions were about personal sexual lifestyle issues. For the focus group study; a total of 32 FGD Participants were purposely selected from all 6 rural and 6 urban Kebeles. Four successive focus group discussions were held with youths disaggregated by rural (16) and urban (16) grouping 8 in each group. The instrument was pre-tested for consistency of responses by taking 5% of the sample size, after selecting one town and one rural Kebele which were not included in the study. After analyzing the pre-test results the necessary modifications were made accordingly, before using it in the actual survey. One day intensive training was given to the data collectors and supervisors. The day-to-day data collection process was followed by the PI and supervisors. Finally 5% of the samples were re-interviewed by supervisors and principal investigator. All returned questionnaires have been manually checked for completeness and consistency manually. Data was coded and entered into EPI INFO Version 2000 and analyzed using SPSS 15.0. Both descriptive and analytical statistical test procedures were utilized. Kaplan-Meier (KM) and Cox proportional hazard regression models were used to estimate the probability of age at sexual debut. All Ethical procedures relevant to the study were undertaken.

RESULT

Socio-demographic characteristics

A total of 1236 youths participated in the study, giving a response rate of 95.5 %. Fifty one percent of the respondents were rural by resident and Male to female ratio was 0.97:1.02. Fifty seven percent of youths were in between 15-19 years, with a mean age

of 19.4 years (SD = 2.7). Only 29.6% of the rural youths had had high school and above education while 78.8% of their urban counterparts had similar educational level. The majority 79.1 % Of youths weren't ever married. About 37 % of youths are not currently enrolled in school, and 25.4% had some job on payment basis. Socio-demographic characteristics, particularly gender, place of residence and age were significantly correlated with early sexual debut. Rural youths were found to engage in early sexual intercourse compared to their urban counterparts (Adjusted OR [95% CI] 1.75(1.19, 2.55)). Gender being females Adjusted OR [95%CI] =1.56(1.11, 2.19), and younger age group (Adjusted OR [95%CI] 1.75(1.19, 2.55) were tend to initiate sex earlier. Regarding other socio demographic characteristics, being in marital status, union and having either less educational status were more likely to be early initiators.

Parent child connectedness and communication

A total of 12 questions were asked to assess respondents' connectedness with family. Respondents scored a range of 0-12 mean \pm SD (8.2 \pm 2.96). T- test for independent sample to understand weather there is a mean difference related to family characteristics between rural and urban parents showed that rural parents have more conservative norms $t= 7.4$ (P value < 0.001) than urban parents. However there were no significant mean score differences regarding family connectedness and supervision or guidance between rural and urban parents. Participants who didn't found it easy to discuss important matters with their mother were more likely to initiate sex earlier (adjusted OR=2.48(1.48, 4.17). Less family connectedness as measured by less caring attitude and less parent child communication, were an independent predictor of early sexual initiation (adjusted OR=2.30(1.35, 3.91)). However family conservative norms were not found to be a protective factor for early sexual initiation after adjusted for other family socio-demographic and religious factors (Table 1).

Table 1: Correlates of family communication and connectedness with early sexual initiation among youths in Dessie town and Dessie Zuria rural Woreda, Ethiopia March 2008

Determinants	Age at sexual initiation		Crude OR (95% CI)	Adjusted (95% CI)	OR
	Early less than 18	Late greater than 18 years			
Family connectedness					
Highly connected score =>3	94(24.5%)	127(50.8%)	1.00	1.00	
Low connected score=<2	290(75.5%)	123(49.2%)	2.68 (1.69,4.25)	2.30(1.35, 3.91)	
Family conservative norms					
Not conservative score	212(55.2%)	127(50.8%)	1.19 (.867,	.852(.581, 1.250)	

=<2			.867)		
Conservative score=>2	172(44.8%)	123(49.2%)	1.00	1.00	
Family supervision & support					
Less supervision	205(53.4%)	105 (42.0%)	1.58 (1.15, 2.18)	1.426(.852,2.097)	
More supervision	179(46.6%)	145(58.0%)	1.00	1.00	
Response of mother to sex related questions					
Will answer helpfully	39(10.2%)	50(20.0%)	1.00	1.00	
Will not answer	345(89.8%)	200(80.0%)	2.21 (1.41,3.48)	2.48(1.48, 4.17)	

* Adjusted for family characteristic variables (family structure, parent and teen connectedness, parental supervision and parental value towards kids' sexual relationship)

Knowledge of Youths about Pregnancy, STI and HIV

Only 7.7% (12% of urban and 2.6% rural) of youths know about emergency contraception. Awareness about HIV seems universal. However, the scope of knowledge of youths about STIs apart from HIV/AIDS was particularly limited (only 34%). Misconception about HIV/STI transmission exists despite about 68% of the respondents were able to list the three primary prevention of HIV transmission. Some of the misconceptions were reflected in 7%, 3.4%, and 2.1% of the respondents believe that mosquito bite, sharing items with infected individuals and French kissing will transmit HIV. Furthermore, 9 % of the respondents believe that douching can prevent both HIV & STIs.

Peer pressure

Those youth who are encouraged by their peers to have girl/boy friend were more likely to initiate sex earlier (crude OR 1.8(1.30, 2.48) and 1.8(1.26, 2.26) respectively. However, these two variables were not found to be independent predictors of early sexual initiation after adjusted for other socio-demographic and attitudinal variables. Rather adolescents who perceive premarital sex is just what everyone is doing and who perceive most of their friends have premarital sex were more likely to initiate earlier than those who disapprove premarital sex (Adj OR (95%CI)=1.82(1.18, 2.81) and Adj OR (95%CI) = 3.66(1.42, 9.36) respectively.

Non- sexual risky behaviors

Logistic regression analysis showed that youth who chew Khat were twice more likely to initiate sex before 18 years of age (adjusted OR [95 % CI] = 2.05 [1.05–3.96]). In like manner, those who drink alcohol had also similar results (adjusted OR [95%CI] = 2.16 [1.12–4.18]). Further analysis showed that the age of sexual initiation with the age

viewing pornographic materials it was more than 2.9 times higher for those who view pornographic materials at earlier age (less than 18 years) OR=2.858 (1.47, 5.56) and further when it was adjusted for other variables, such as drug abuse and socio-demographic variables it becomes 24 fold, adjusted OR (95%CI) = 24.13 (3.28, 177.83) (Table 2).

Table 2: Binary logistic regression showing the risk of nonsexual risk behaviour to early sexual initiation, by youths in Dessie town and rural Woreda, Ethiopia March 2008

Determinant	Age at sexual initiation		Crude OR (95% CI)	Adjusted (95% CI)	OR
	Early < 18 years	Late ≥ 18 years			
Used drugs (n=634)					
Yes	263(68.5%)	49(19.6%)	1.887 (1.292, 2.74)	2.046(1.056, 3.97)	
No	121(31.5%)	201(80.4%)	1.00	1.00	
Drink Alcohol (n=634)					
Yes	246(64.1%)	183(73.2%)	1.532 (1.00, 2.34)	2.164(1.120, 4.16)	
No	138(35.9%)	67(26.8%)	1.00	1.00	
Age at Drink Alcohol					
Less than 18 years	115(82.1%)	45 (67.2%)	2.25(1.152,4.389)	3.385(.65,17.60)	
Greater than 18 years	25(17.9%)	22(32.8%)	1.00	1.00	
View pornographic materials					
Yes	258(67.2%)	89(35.9%)	1.125(.81,1.57)	1.021(.12, 9.02)	
No	126(32.8%)	159(64.1%)	1.00	1.00	
Age at viewing pornography					
Less than 18 years	110(85.9%)	62(68.1%)	2.858 (1.47, 5.56)	24.13(3.28, 177.83)	
Greater than 18 years	47(14.1%)	29 (31.9%)	1.00	1.00	

Median age of sexual initiation and Sexual Behavior

About half, 51.3% of the surveyed youths nearly in equal proportion between rural and urban 49.8%and 51.3 % have ever had sex respectively. The median age at first sex is a general measure of youthfulness that indicates how quickly sexual activity builds up among the youthful population. The Mean & median age of sexual initiation in our findings were 16.8 years (SD= 2.25) and 17 years respectively (Range 8-24 years). A considerable number of high risk sexual initiation was also noted among the study participants. 2.4% & 8.7% initiated their first sex with CSW and causal partner respectively. Moreover, significant proportion of the first sexual practice was unplanned (39%) and unprotected (65%) and nearly 61% of the youths started sex before age 18 years.

Cox proportional hazards model for the survival of not having sex using age as a follow up showed the hazards of starting sex earlier is higher for rural youths than urban Adjusted hazard ratio [(AHR) (95%CI)) =1.447(1.165-1.797) or the Probability of rural youths to start sex earlier was 60% with CI of (54 %, 71%)]. Furthermore, we identified that the probability of surviving without sex up to age 18 was 40%. Figure-2 shows that Plots of the KM curve for female rural urban indicates a wide gap between the rural females and urban females. It suggests that rural females tend to initiate at younger age than urban counterparts. It may further indicates that still rural females are engaged to marriage at a younger age. Figure-3 KM plot for males however, didn't show a significant difference between rural and urban males. The age at sexual debut is higher among males [(mean [95% CI] = 17.22 [16.98-17.]) than the females (mean [95% CI] = 16.47 (16.22-16.71))] and the difference is significant (P= 0.012) (Fig 1&2).

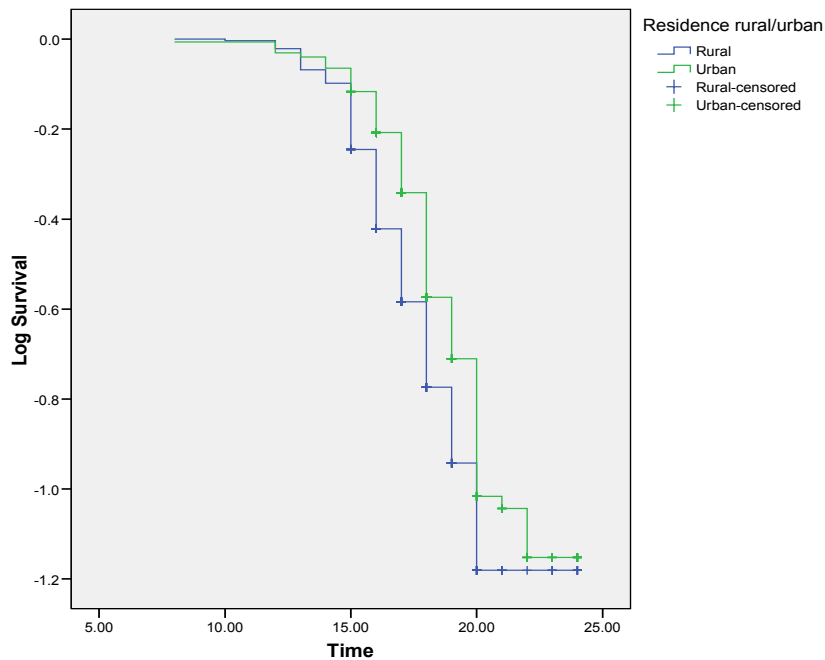


Fig 1. kaplan maier curve showing log survival for age at sexual debut for rural and urban female residents in Dessie town and rural Woreda, march 2008,

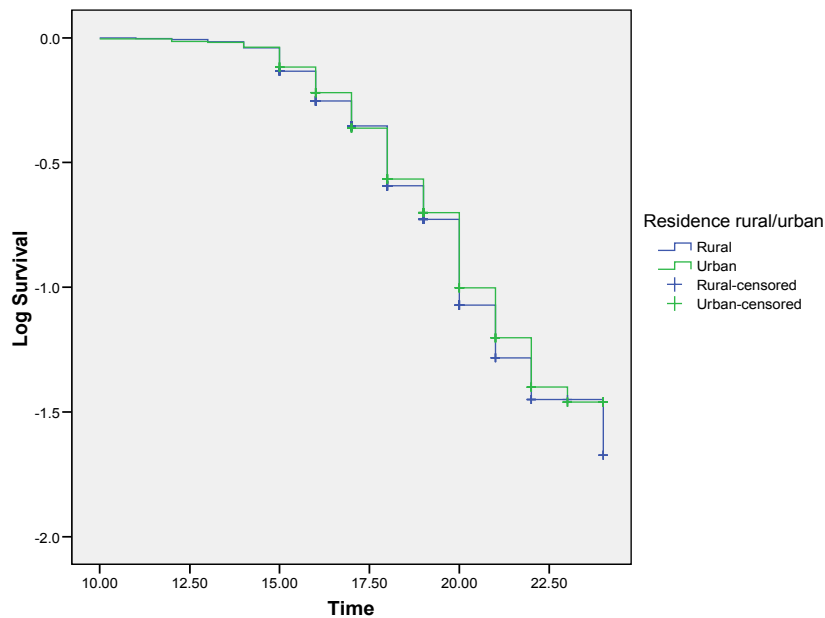


Fig2.Kaplan Maier cure shows log survival for age at first sexual Debut for male rural and urban youth in Dessie town & Dessie zurral woreda, march 2008

Among those who are sexually active the main reasons to engage e in sex at the first time were marriage (41 %) for rural and (25%) for urban youths , followed by curiosity (14.7%) for rural and (23.9%) for urban youths, respectively. Being cheated, after using drugs/alcohol, and rape were accountable for 10.9%, 6.2% and 6.9% of initiations for sex respectively. Among Youths who were not sexually active, the main reason for their abstinence were not to do it before marriage by 40% of urban and 25 % fear of disease including HIV, to wait until older and due to religious value.

Nearly two third of the sexual initiations were unprotected and some occur with higher risk groups. Half of the sexually active youths have more than one sexual partner in there life time. It was encouraging to note that the proportion of youths who reported to have multiple partners in the last 12 months was dropped to 36% from life time number of multiple partnership (56%). This may be an indication of recent behavioral change. The mean \pm SD number of partners in he last twelve months and in life time were 1.63 ± 1.7 and 2.55 ± 2.4 , respectively. Of the sexually active youths, 14.2% had sex with a non-regular (causal) sexual partner. Although two third of the youth ever used condoms, only 36% of them used regularly. Twenty nine percent of male respondents had sex with a commercial sex partners in the 12 months period prior to the survey and significant number 37% hadn't use condom consistently. There was significant variation in condom use among rural and urban boys. Seventy seven percent of urban boys use condom consistently while only 50% of rural counterparts use condom irregularly while practicing sex with CSW.

Impact of early sexual initiation on ARH outcomes

Consistent with the perceived level of sexual activity by youths, there is equally high incidence of adolescent pregnancy. Of the 150 female youths surveyed, 45% were pregnant at least once in their sexual life time. Among these, 68% were unplanned (i.e. in 74% of urban versus 63% of rural residents) and thus youths seek for abortion. Nearly 42 % of the unwanted pregnancies ended up with abortion. Accordingly 86 % of the abortions were induced. When asked about the person who performed the abortion, they reported that 47% of the abortions were induced by themselves. Thirteen percent of the youths reported STI at least once in their reproductive life. Regression analysis showed that RTIs, such as pelvic and vaginal infections. Multiple partnership and STIs were two times more likely to occur in early sex initiators than late initiators [adj. OR 95%CI] =2.08(1.17, 3.72) and [adj. OR (95%CI) = 2.33(1.61, 3.37)]. The likelihood of using contraceptive at first sex and constant use at subsequent reproductive life were two times less for early initiator than late initiators [adj. OR 95%CI] =2.33(1.61,3.37)) and [adj. OR 95%CI] =2.174(1.449,3.260)]respectively (Table 3).

Table 3: Impact of early sexual initiation to ARH problems in Dessie town and Dessie Zuria rural Woreda

Determinants	Age at first sex		Crude OR (95% CI)	Adjusted OR (95% CI)	
	Early initiation < 18 years	Late initiation ≥ 18 years			
Consistent use of Contraceptive					
Yes	176(64.0%)	99(36.0%)	1.00	1.00	
No	149(55.6%)	119(44.4%)	1.420 (1.006, 2.004)	2.174(1.449,3.260)	
First sex protected					
Yes	89(44.1%)	113 (55.9%)	1.00	1.00	
No	295(68.3%)	137(31.7%)	2.734(1.939, 3.856)	2.332(1.614,3.369)	
Unwanted pregnancy					
Yes	72(70.6%)	30(29.4%)	.918 (.426,1.978)	4.045(1.823, 8.976)	
No	34 (72.3%)	13(27.7%)	1.00	1.00	
Multiple partner					
Yes	242(68.2%)	113(31.8%)	2.050 (1.482, 2.838)	2.332(1.614,3.369)	
No	140(50.9%)	135 (49.1%)	1.00	1.00	
STIs					
Yes	65(78.3%)	18(21.7%)	2.611(1.507, 4.521)	2.082(1.165,3.723)	

No	315(41.9%)	227(58.1%)	1.00	1.00	
Have abortion					
Yes	39(68.4%)	18(31.6%)	.808(.392, 1.666)	1.605(.726, 3.549)	
No	67(72.8%)	25(27.2%)	1.00	1.00	

DISCUSSION

The Mean & median age of first sexual initiation in our finding is comparable with several previous studies In Ethiopia (1, 9). It is slightly higher from previous studies in kolladuba (15 years) and Gojam (13.5 years) may be explained by the decrease in early marriage which was the main reason for early sexual initiation in rural youths due to the recently endorsed family law(2,,8). Another explanation may be AIDS-ravaged countries; campaigns to delay first sexual intercourse may have had an inhibiting effect, particularly among females. This indication of early entry to sex life has very important implications for the sexual & reproductive health of youth and reaffirms the need to gear the focus of available SRH education programs and services in schools & at the community for out of school youths not only on the transfer of knowledge but also on skills that help youth delay sexual debut.

The existence of risky sexual practice including premarital sex, unprotected sex with non marital partners and sex with female commercial sex workers are reported by both urban and rural adolescents. In this study, 55% of the urban youths and almost the same number (54%)of the rural sexually active youths had more than one partners. In consistent with this finding, a survey done among high school youths in Dessie, Bahardar, Jimma and Dire Dawa come up with almost similar findings (52%). This study also showed that the odds of having multiple partnership were two times higher for those who initiated sex at less than 18 years. There is association of HIV status with younger age at first sex, which is likely due to an increased number of lifetime partners. This increase could result from longer duration of sexual life. Prevention of HIV infection should include efforts to delay age at first sex in young men and women. The expected effect is a decrease in the number of lifetime partners (Auvert et.al. 2002).

There was significant variation in condom use among rural and urban boys. A study done in Gojam revealed that contraceptive use including condoms was ten times lower among rural adolescents (7). This may be due to the limited accessibility of condom to rural youths and false self susceptibility belief such as HIV is not a rural disease considering CSW and urban residents as high risk group, as noted by FGD participants.

Surveys from 40 countries indicated that more than 50 % of the young people harbor serious misconceptions about how HIV/AIDS is transmitted(4).The figure in this study is low when compared with other results. However, as shown by a number of studies, misconceptions and negative attitudes about HIV/AIDS may have implications for behavior change initiatives.

This study further identified that family connectedness was highly associated with delay at initiating. This study supported by a study conducted in USA which identified. Both relationship satisfaction and maternal attitudes toward premarital sex were inversely associated with the initiation of sexual activity. A study in USA, which examines the association between the gender mix of one's friends and early sexual activity, does suggest that having a much greater number of opposite-sex friends at a relatively early age may be related to early intercourse. The transition to adolescence is a period of rapid change, and young adolescents seek peer connections to obtain a stable point of reference during this time (Brown, 1999; Newman & Newman, 2001) (7).

Substance, alcohol use and viewing pornographic materials were other determinants for early sexual initiation as identified by this study. Ethiopia's increased openness to Western culture has resulted in the influx of pornographic videos, books, and magazines, whose consumers are mostly young people. Western pornography often preceded sexual initiation and helped couples to "loosen up" the Ethiopian culture to some extent. Drug trafficking and drug abuse, are becoming more common now a days in Ethiopia. According to the MOH Department of Pharmacy of the MOH report for 1993-94, it is exacerbated by lack of employment opportunities and general feelings of hopelessness. Chat chewers were 2-3 times initiate sex early more than non chewers. Alcohol drinking usually follows khat chewing and might be associated with unprotected sex and early initiation. This finding is supported by similar study in Butajera. Those who drink at least once per month initiate sex early more than two times compared to those who don't drink. When further stratified by age, those who drink in less than 18 years age are 3 fold more likely to initiate sex compared to those who didn't drink alcohol or started drinking lately. A study among in and out of school Ethiopia youths found similar results. Moreover, sex after drinking alcohol is more likely unprotected, because alcohol decreases self control and sexual negotiation skill of adolescents (9).

Findings from a number of cross-sectional studies suggest that early initiators may continue with patterns of behavior that place them at higher risk than peers who have delayed first intercourse. In this study we also found that early initiators are more likely to have STIs than late initiators. Inconsistent with this finding, retrospective reports in

USA showed that early initiation have been correlated with a greater number of sexual partners, lower levels of condom use, a greater chance of unintended pregnancy and a higher risk of STIs, as well as having other risk behaviors, including drug use (9,10).

CONCLUSION

- 1) The prevalence of early sexual initiation was high. And the first sex tend to be unplanned and unprotected.
- 2) Early initiators were more likely to be involved in subsequent high risk sexual behaviors, characterized by multi-partner sex and no or inconsistent use of condom casual partnership, unprotected and a wide sexual network.
- 3) Awareness about HIV/AIDS among adolescents was found to be high. This knowledge seems not reflected in their sexual lifestyles. STI knowledge is low, and the reported cases of STI was high.
- 4) Some cultural beliefs and practices in the countryside exacerbate young people's vulnerability to HIV/AIDS.
- 5) This study identified non sexual risky behaviors like viewing pornographic materials at earlier age , using drugs and drinking alcohol specially at earlier age are an independent predictors of early sexual initiation;
- 6) Three key unmet needs of adolescents emerged from the present research:
 - SRH information, education and communication;
 - Life skill education at schools and community to equip youths with the necessary life skill such as communication, negotiation and refusal
 - Enabling environment for ARH services specially for rural youths;

RECOMMENDATION

1. Delaying sexual debut is the pillar of HIV/STIs prevention among young people. This can be achieved through starting sexual education programs at earlier life as well as this sex education programs should be well designed and include:
 - a. Providing youth with accurate and uncensored information about sexual biology, birth control, and STIs etc... Curriculum should be geared to emphasize skill transfer and should be in a comprehensive, logical and repetitive manner starting from lower grade;
 - b. Sex education programs should be designed to reach out of school youths. This can be done by arranging Community conversation programs and establishment of rural youth RH, anti-AIDS and peer educator clubs.

- c. Parents and teachers should be trained in a way that can enable them to acquire their teens with the necessary skills for sexual negotiation;
2. Strengthening the norm of virginity should be advocated. Skills and services to practice safe sexual life should be conveniently available. Such as methods to access for condoms, contraceptives including emergency contraceptive etc... should be sought. Programs should be designed such as distributing through youth clubs (peer educators) for rural and urban, accessing condom at schools and using coin box machines in towns, etc...;
3. The strong association between chat, alcohol and viewing pornography entails
 - a. The need to teach young people, teachers and parents. The linkage and possible consequences of non sexual risky behaviours for SRH should be part of the lesson.
 - b. government(policy Makers) Should think of setting a legal age for buying and using alcohol and Khat and restricting Video houses;
4. Strengthen and implement the proclamation designed for the age at marriage
5. Involve religious leaders in sexual and reproductive health education. Specially they are important in convincing parents and enforcing the norm of virginity.

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THESIS-FIVE

Assessment of HIV Sero-discordance, Sexual Behavior and Practice of Preventive Behavior against HIV among Premarital Couples Attending VCT in Bahir Dar, Northwest Ethiopia

Gizachew Tadele,

ABSTRACT

Background: In generalized epidemics, many infections occur within marital and cohabiting unions and the HIV-negative partners in discordant couples are at very high risk of contracting HIV if the couple does not take steps to protect the HIV-negative partner.

Objective: To assess sero-prevalence of HIV, practice of preventive behavior and sexual behavior among premarital couples in Bahir Dar, Ethiopia.

Methods: A cross-sectional study was conducted from March-June 2008 among premarital couples attending VCT in Bahir Dar. Socio-demographic characteristics, sexual and practice of preventive behavior were collected using a pre-tested structured questionnaire. HIV testing was conducted using rapid tests in accordance with MOH policy.

Result: The overall HIV sero-prevalence of the study participants was found to be 3.8%. The prevalence in females (5.1%) was higher than that in males (2.6%). The prevalence of sero-discordance in this study was found to be 3.6% with 2.1% of concordance positive and 94.4% of concordant negative. Among the different age groups, the highest prevalence (33.3%) of HIV infection was observed in those aged 20-24 years. Those living together without formal marriage were 15-times more likely to be infected than males (AOR [95% CI] = 15.78[2.38-104.61]). Those who perceived themselves at moderate or high risk of acquiring HIV infection were 4 times more likely exposed to HIV infection (AOR [95% CI] = 4.63[1.29-16.57]). Median age of sexual debut was generally decreasing across age cohorts.

Conclusion: The study indicated a significant prevalence of HIV infection, particularly among females. In the majority of sero-discordant premarital couples, it was the woman who was infected before entering in to marriage. This showed an increased risk of vulnerability to HIV infection, because most of these couples did not mutually know their

HIV status. Despite the fact that many respondents had had sexual contacts, with most of them not using condoms consistently, in addition, only a minority perceived themselves to be at risk of HIV/ AIDS. Hence, programs (RH or VCT programs) should address females before entering in to marriage is recommended.

INTRODUCTION

The epidemiological features of HIV infection in Africa are strikingly distinct from those in Europe. Heterosexual activity is the major mode of transmission. Communities with high HIV prevalence rates have higher rates of concordant positive and discordant couples. In generalized epidemics, many infections occur within marital and cohabiting unions either because of prior infection by one partner or infidelity within marriage. A high proportion of new HIV infections are likely to occur within discordant couples. The HIV-negative partners in discordant couples are at very high risk of contracting HIV if the couple does not take steps to protect the HIV-negative partner. Transmission risk is high among steady discordant couples who do not take preventive measures such as using condoms than concordant negatives (1).

In Ethiopia, as per EDHS 2005, the prevalence of HIV in urban population is high with high discordance rate (7.8%). Moreover, early sexual initiation and premarital sex among youth is increasing, but use of protective measures such as condom and VCT is low (2). Large regional differences in HIV prevalence exist (Adult HIV prevalence in Somali- 0.8%, in AA 7.5%) (6). In 2004, ANC based surveillance estimates HIV prevalence in Bahir Dar was 14% in Felege Hiwot Hospital and 13.5% in Bahir Dar Health Center (3). However, prevalence of HIV among couples in Bahir Dar was not known.

Although it is known that protection of uninfected partner is an acknowledged best practice in HIV prevention, it has not received much attention in the literature in determining magnitude especially among premarital couples in Ethiopia. Assessing these issues would have valuable importance to devise interventions for premarital couples especially for those sero-negative partners. Because knowing their HIV status and sexual behavior, is possible to curb the spread of infection by preventing the other partner from becoming infected. Where such knowledge of infection status and sexual behavior is not available, the probability of sero-conversion is high as little or no preventive action is taken, thus increases the level of prevalence and its attendant evils. Hence, this paper assessed the prevalence of HIV sero-discordance and sexual and practice of preventive behaviors against HIV in premarital couples in Bahir Dar.

METHODS

A cross-sectional descriptive facility based survey was conducted in Bahir Dar city in all nine VCT centers in the town (11 sites) including; governmental, private and NGO Centers between January-March 2008.

The required sample size was determined using the formula for single population proportion of a cross-sectional survey.

$$n = \frac{z_{\alpha/2}^2 p (1-p)}{d^2}$$

Where, n = required minimum sample size.

p= the assumption of HIV prevalence in either of partners tested positive
is taken to be 13.5% (3)

Z = is a standard score corresponding to 95% CI, and is thus equal to 1.96.

d = is the precision, and will be taken as 5 % (0.05).

Substituting the above values, gives the sample size to be 180 couples. Adding 10% non-response rate gives the final sample size of 396 participants (198 couples). These study participants were sampled from all VCT sites using non-proportionate allocation technique.

A pre-tested, structured questionnaire prepared in English and then translated in to Amharic was used to collect information on socio-demographic, socio-economic, sexual history, knowledge of STI/HIV and HIV CT and practice of preventive measures. All premarital couples who came for CHCT and hear their test results together were interviewed. The interview was conducted prior to pre test counseling. Data were collected on each participant on one to one basis in a counseling room. Each consenting participant was given a code first; then the test result was registered after post test counseling. All consenting couples were counseled and serially tested for HIV, using rapid tests in accordance with the MOH policy. All prospective premarital couples who came for premarital HIV testing together were included in the study. Pretest counseling was provided for those who agreed to HCT. The health professionals involved for the interview were HIV counselors working as permanent employees of the respective health facilities.

Ethical clearance was obtained from Addis Ababa University, School of Public Health. The necessary permission to undertake the study was also obtained from the regional health bureau. All the study participants were informed about the purpose of the study, their

right to refuse and assured confidentiality. Informed verbal consent was obtained prior to the interview. To ensure confidentiality, anonymous type of interview was employed, where names of the interviewee was not written on the questionnaire. Continuum of comprehensive HIV prevention, treatment and care & support were there for those HIV positive and sero-discordant partners.

RESULTS

Socio-demographic characteristics

A total of 198 premarital couples were recruited in the study. However, interviews were conducted with a total of 195 premarital couples, excluding questionnaires filled partially or incorrectly. This gives a response rate of 97.9% from which the final analysis was calculated. The median age for male and female respondents was 24 and 19 years, respectively. About 38% of the respondents were within the age range of 20-24 years, while 29.5% were aged 15-19 years. The age range in males was 18-60 years and that of females was 15-50 years. Majority of the respondents (96.7%) were from the Amhara ethnic group, and 95.6% were Orthodox Christianity religion followers. The largest proportion of premarital couples (62.6%) was never married, followed by divorced (29.5%), widowed (4.4%) and living together (3.6%). More than half of the study participants (54.9%) have received formal education. The rest (45.1%) had no formal education. Of these, 146 (37.4%) participants were unable to read & write, while 30 (7.7%) were able to read and write (but no formal education), 34.1% attended secondary school, 14.4% primary and 6.4% tertiary school. About 16% of the participants had no job (unemployed), while 21% were students, 18.5% daily laborers, 17.9% farmers & 7.4% government employees.

HIV sero-prevalence and sero-discordance

HIV sero-prevalence in this study was found to be 15(3.8%) (95% CI = [1.9-5.7%]). The prevalence in females (5.1%) was higher than males (2.6%). Of all participants, 7 couples (3.6%) (95% CI = [1.0-6.2%]) were found to be sero-discordant, 4(2.1%) concordant positive and 184(94.4%) were concordant negative. Of the 7 sero-discordant couples, 6 females and 1 were positive. Among 5 couples where male partners were infected. One (20%) of the prospective female partners were HIV negative; among the 10 couples where female partner infected, 4(40%) of the prospective male partners were HIV negative. Among the different age groups, the highest prevalence (33.3%) of HIV infection was observed in age group of 20-24 years. The lowest prevalence (6.7%) was observed in age groups of 15-19 & 45+ years.

Sexual behavior

Nearly half, 205 (52.6%) were found to have had sexual experience. Disaggregated by sex, a greater proportion of males (59.5%) were sexually active than females (45.6%). Of these 40 (34.2%) males & 23 (11.8%) females were never married (an overall premarital sex rate of 63/244 [25.8%]). Of all discordant partners 10(71.4%) claimed ever having sex while 7 (87.5%) of the concordant positive claim so. Males were two times more likely to engage in premarital sex among never-married couples (COR [95%CI] =2.35[1.30-4.24]). Gender stratified multivariate analysis among study participants showed that females were more likely to initiate sex before the age of 18 years than males ($\chi^2[p \text{ value}] = 31.25 [<0.001]$). Similarly, there was gender difference in use of condom at first sex ($\chi^2[p \text{ value}] = 4.46 [<0.05]$). However; there was no significant difference in having multiple sexual partner and consistent condom use for the past one year in both sexes. Multivariate analysis showed that, although reverse causality is highly likely, females were half as likely to engage in premarital sex (AOR [95% CI] = 0.49 [0.24-0.98]). Similarly, those couples who perceived themselves to be at low or moderate risk of HIV (AOR [95% CI] = 4.24[1.90-9.48] & 11.72(3.31-41.53)) and those who had had VCT (AOR [95% CI] = 4.67[2.67-9.61]) previously were more likely to have premarital sex than their counter parts.

The mean (SD) and median age of first sex was 18.3 ± 3.7 and 18 years, respectively. The median age of sexual debut was decreasing across age cohorts from 18 years for current age 40-44 to 16 years for current age 15-19 years. The median age at first sexual intercourse has decreased over the past two decades, from 20 years for men age 40-44 years to 16 years for men age 15-19 years. The mean age at first sex among females (16.5 ± 2.8) was lower than males (19.7 ± 3.7). While the median age at first intercourse across the different age cohorts in women indicates that there has been a significant change from 19 years in age 30-34 years to 15.5 years for age 15-19years and to 16.5 years for age 40-44 years. To investigate the impact of socio-economic variables on age of first sexual debut, multivariate analysis was done. Only gender remained independently associated with age of sexual debut. In this analysis, females were 7 times more likely to have engaged in first sexual intercourse before the age of 18 years(AOR [95% CI] = 7.90[3.62-17.26]). However, literacy level, marital status and knowledge on HIV had no effect on age of sexual debut.

Practice of preventive behavior - HIV Counseling and Testing

Overall, 44.1% of the male & 30.8% of the female respondents had been tested for HIV previously. All concordant positives and 11(78.6%) discordant partners had not been tested for HIV previously. Literate people were 4-times more likely to have VCT previously (AOR [95% CT] =4.80[2.62-7.79]). Similarly, sexual exposure was significantly associated with having VCT previously (AOR [95% CT] =3.54[2.12-5.92]). However, gender (AOR [95% CT] =0.70[0.44-1.12]), knowledge about HIV/ AIDS (AOR [95% CT] =1.04[0.56-1.93]), and self perception of susceptibility (AOR [95% CT] =0.55[0.26-1.17]) were not predictors of past VCT utilization.

Condom use

Only 25 (12.3%) study participants used condoms during their first sexual encounter i.e.19 (16.5%) males and 6 (6.7 %) females (COR [CI 95%] =2.74 [1.04-7.18]). Based on multivariate logistic regression analysis, only marital status was significantly associated with use of a condom at first sex (AOR [CI 95%] =0.13 [0.05-0.34]). Condom use at first sex was reported in none of concordant positives or discordant couples.

Determinant factors for HIV sero-prevalence and discordance

In this study, it was found that those couples who were exposed to sexual intercourse were at a higher risk of acquiring HIV infection than those not exposed (COR [95% CI]= 3.77 [1.05-13.58]). Perception of susceptibility of acquiring HIV infection has a significant association with the outcome variable (COR [95% CI] = 4.88[1.55-15.34]). On the other hand, there was no significant difference in sero-positivity among those who had multiple sexual partners, premarital sex, educational status, and attitude towards premarital sex and condom use. To investigate the impact of socio-demographic variables on outcome variable multivariate logistic regression was used. Marital status and risk perception remained independently and significantly associated with HIV sero-status. In this analysis those couples living together without formal marriage were 15 times more likely to be infected than never married couples (AOR [95% CI] = 15.78[2.38-104.61]). Perception of susceptibility of acquiring HIV infection was significantly associated with risk of infection, with those who perceived themselves at a moderate or high risk of acquiring HIV infection more likely to be infected than those who did not perceive themselves at risk (AOR [95% CI] = 4.63[1.29-16.57]). However, sexual exposure was not a predictor of HIV infection (AOR [95% CI] = 1.40[0.23-8.73]) (Table 1). Socio-demographic variables, sexual behavior and ever being HIV tested were not significantly associated with HIV discordance.

Table 1: Factors associated with HIV Sero-positivity in Bahir Dar, Ethiopia, 2008

Variable	HIV Status		COR (95% CI)	AOR (95% CI)
	Reactive	Non-reactive		
Marital status				
Never married	5(2.0)	239(98.0)	1.00	1.00
Divorced	4(3.5)	111(96.5)	1.72(0.45-6.54)	1.15(0.21-6.25)
Widowed	1(5.9)	16(94.1)	2.99(0.33-27.12)	2.48(0.20-30.21)
Living together	5(35.7)	9(64.3)	26.56(6.50-108.44)	15.78(2.38-104.61)
Risk perception				
No or low chance	9(2.8)	316(97.2)	1.00	1.00
Moderate or high chance	5(12.2)	36(87.8)	4.88(1.55-15.34)	4.63(1.29-16.57)
Sexual exposure				
Yes	12 (5.9)	193(94.1)	3.77 (1.05-13.58)	1.40(0.23-8.73)
No	3(1.6)	182(98.4)	1.00	1.00

DISCUSSION

HIV sero-prevalence among premarital couples was found to be 3.8% in this study. This is higher than the national EDHS 2005 survey result among cohabiting couples (2.1%) and the overall national adult prevalence (2.1%) (2,3). However, the prevalence is lower among premarital couples attending for VCT in Addis Ababa (13.2%), in Kenyan (11%) and Nigerian premarital couples (20.8%) (4,5). This could be attributed to differences in temporal and method of study populations selected between these studies. The proportion of females who were sero-positive for HIV infection (5.1%) was almost twice as high as males (2.6%). This was in line with other reports indicating a higher prevalence of HIV infection in females than males. The condition is multifactorial and may be related to increased vulnerability to HIV infection due to biological, social and economic disadvantages related to gender (1). Sexual exposure and number of sexual partners had no impact on HIV sero-status in this study. This is in contrast to a study among street dwellers in Gondar city (5). The possible explanation would be low risk sexual exposure in

this study population. Those couples who live together were more exposed to HIV infection and might be explained by having sex before mutually knowing their sero-status. This is in accord with EDHS 2005 reporting higher infection rates among cohabiting couples (9.1%) than married couples (2.0%) (2). However a study among premarital couples in Kenya reported that being widowed or divorced was significantly associated with the sero-status (7). Age specific HIV infection was higher in the age group of 20-24. This is different from South East Nigeria studies in which the infection rate was higher in the 25-29 years group (4), but consistent with national reports. In this study neither gender, educational status nor employment status were associated with sero-status of couples which is different from a study findings in Kenya (7).

The prevalence of sero-discordance was found to be 3.6% which is higher than national EDHS 2005 survey among cohabiting couples (2). However, this was lower than a study in Dessie (9.8%) among couples (8) and urban residents in EDHS 2005 survey among cohabiting couples (2). This might be explained by differences in study population. Prevalence of sero-discordance among never married couples is still lower as compared to a study in Dessie among never married couples (most premarital) (6.2%) (95% CI = [0.05-0.08]). When compared to African countries it is also lower i.e. 15% among Kenyan premarital couples (7) and 8-31% in Eastern and southern African countries (9). This might be attributed to temporal and special differences between study populations. The prevalence of sero-positive women among discordant was found to be 85.7% which is higher than a similar study done in Dessie (50%) and Kampala (59%) at VCT centers (8, 10). Educational status was not found to be significantly associated with sero-status of study subjects, which is similar to a study in Dessie and in Kampala (8, 10). Similarly in this study occupational status and age category had not significantly associated with sero-status of the study participants unlike a study findings in Dessie.

Males started sex later than females. This might be the fact that early puberty among females. This is in line with EDHS 2005 reporting that 65.2% of the females (25-49 years) and 15.8% of the males (25-59 years) had sex before the age of 18 with median age of first sex 16.1 years and 21.2 years respectively. The median age of sexual debut was decreasing across age cohorts from 18 years for current age 40-44 years to 16 years for current age 15-19 unlike EDHS 2005 survey that reported increasing median age of sexual debut (2). This might be due to difference in study population- in DHS the rural population was also included.

Sexual history and other certain questions are of course sensitive, and it is important to remember that respondents' answers are likely subject to social desirability bias.

Nevertheless, it has significant implications for sexual and preventive interventions for premarital couples, since abstinence and delaying sexual initiation still constitutes a primary pillar in the prevention of HIV and conventional STIs.

Conclusion

HIV sero-prevalence and sero-discordance were found to be 3.8% and 3.6% respectively. In the majority of sero-discordant premarital couples, it was the woman who was infected before entering in to marriage. This showed an increased risk of vulnerability to HIV infection, because most of these couples did not mutually know their HIV status. The median age of sexual debut was decreasing. Despite the fact that many respondents had had sexual contacts, with most of them not using condoms consistently, only a minority perceived themselves to be at risk of HIV/ AIDS. Hence, Programs (like RH) addressing females especially before entering into marriage and strengthening or establishment of programs advocating the use of condoms, particularly programs targeting premarital couples should be emphasized. Further biological and immunological studies to assess determinant factors for discordant couples are recommended.

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Asses THESIS-6

sment of Health Care Workers Occupational Exposure to HIV and Post-Exposure of Prophylaxis (PEP) in Health Centers and Hospitals of Addis Ababa Tadess Alemayehu

ABSTRACT

Background: An occupational exposure that may place a worker at risk of HIV infection is a percutaneous injury, contact of mucous membrane or skin with blood or other body fluids to which universal precaution need to apply. Exploring the knowledge, extent of exposures and practices of health care workers on occupational HIV risks are important.

Objectives: The objective of the study was to assess occurrence of occupational exposures and knowledge and practice regarding HIV post-exposure prophylaxis among health care workers in health centers and hospitals of Addis Ababa.

Methods and Materials: A facility based cross-sectional study, involving 372 health care workers, was conducted in Addis Ababa from March to April 2008. A pre-tested, interviewer administered, structured questionnaire was applied for data collection. Odds ratio with 95% confidence interval and logistic regression analysis were employed to measure the degree of association between factors and identify the predictors for occurrence of needle stick injuries.

Result: The study revealed that 38.2% of health care workers experienced at least one needle stick injury in their life time and 19% of the respondents experienced needle stick injury within the last one year. Rate of needle stick injury in the previous one year was estimated as 1.34 injuries per person. Factors associated with occurrence of injuries were being a nurse (AOR=15.39, 95%CI=3.70-18.05), having work experience for more than 10 years (AOR=2.68, 95%CI=1.30-5.54), working long hours (AOR=1.90, 95%CI=1.10-3.31), attending fewer patients per day (AOR=2.21, 95%CI=1.32-3.58), self perception of high risk HIV (AOR=2.05, 95%CI=1.10-3.82) and non-consistent use of personal protective equipments (AOR=1.67, 95%CI=1.01-2.76). Two hundred sixty four (71.0%) respondents had knowledge about HIV post-exposure prophylaxis.

Conclusion and Recommendation: The findings of this study indicated that occupational exposures were common among health care workers. Health facilities should make available to their system that includes a standardized written protocol and reporting unit for management of occupational exposures. Improvement of work environment and appropriate management of exposed cases, including addressing the psychosocial burden health workers face after exposure is also imperative.

Key words: Occupational exposure, needle stick injuries, post-exposure prophylaxis, health care workers, HIV

INTRODUCTION

Exposure to different body fluids has a potential risk of the transmission of blood borne pathogens to health care workers (HCWs). The prescription of antiretroviral therapy as post-exposure prophylaxis (PEP) following significant potential exposure to HIV has become routine and it is important that individuals with risk of exposure are aware of the procedures to follow and where their first point contact should be in case of an incident occurs.

From research findings, the estimated risk for HIV transmission after injury through a needle contaminated with HIV infected blood and after mucous membrane exposure is 0.3% and 0.1% respectively (1-3). It is estimated that 61% of these infections are due to HBV and HCV and the remaining 39% is due to HIV. World wide, 4.4 % (0.8%-18.5%) of HIV infections among HCWs may be attributable to occupational injuries. More than 90% of these infections occurred in low-income countries, most of which could have been prevented (4, 5).

Health care workers are facing a number of unique challenges to stay healthy in the face of the generalized HIV/AIDS epidemic. This is also becoming synergized by the occupational risk to the virus. Although exposure through occupational injuries can usually be avoided by following good working practices, HCWs should consider the implications of taking PEP. Available data from developing countries show that adherence to the "standard precaution" and documentation of occupational exposures are suboptimal and the knowledge about PEP among HCWs is poor (1, 6). This suboptimal proficiency is also more marked among auxiliary staffs working in health care settings (2). Studies addressing their knowledge and practice are also lacking in developing countries including Ethiopia (2, 6).

This study was therefore conducted to explore existing perceptions and practices of HCWs regarding occupational HIV risks and PEP. This can help to provide an insight to subsequent efforts to improve prevention, diagnosis, treatment and support of HIV/AIDS in relation to the occupational hazard. A conceptual framework was developed which indicated the inter-relationships of factors, which are the basis for occurrence of NSIs and other exposures among HCWs. Understanding the different factors and their relationships will, therefore help to have a better and feasible approach for occupational exposure management at least in our context.

Therefore, the present study was done to assess occurrence, extent and factors associated with occupational exposure knowledge and practice regarding HIV post-exposure prophylaxis among health care workers in health centers and hospitals of Addis Ababa.

METHODS

Study Design and Area: It was a facility based cross-sectional study employing a quantitative method complemented by in-depth interview in Addis

Source Population and Study Subjects: The source population of the study was all health care workers (both professionals and non-technical staffs) working in 29 health centers and 33 different hospitals in the city and the study subjects were health care workers (both professionals and auxiliary) working in 11 health centers and 12 hospitals in the city.

Sample Size: Sample size was determined using sample size calculation for a single proportion. The following assumptions were considered: estimated proportion of needle stick injury 50%, margin of error 5%, standard score corresponding to 95% confidence level to be 1.96. Adding 10% for non-response rate, the final sample size was 388.

Sampling and Data Collection Procedures: Health facilities were stratified based on their ownership and level of care. Then, 40% of the facilities from each stratum were included in the sample. Accordingly, 12 hospitals and 11 health centers were included in the study using population proportional to size. Simple random sampling method was applied to identify the study participants. A total of 6 in-depth interviews were conducted for the qualitative section. Data collection was conducted from March to April, 2008 using pre-tested, structured questionnaire. In-depth interview guide was prepared for the

qualitative section. Eight trained data collectors and two supervisors were involved in the data collection.

Data Analysis Procedures: Data entry and cleaning was performed using Epi-info 2000. The cleaned data was exported to SPSS 13.0 for further analysis. Proportions, percentages, tables and graphs were used for description of the data as appropriate. Odds ratio with 95% confidence interval was used to identify factors associated with occurrence of NSI and knowledge on HIV PEP. Cross tabulations were also made to compare frequencies and percentages. A multivariate logistic regression analysis was employed based on the developed conceptual framework (considering the hierarchical relationships of the factors) to estimate the adjusted odds ratio of the independent variables by controlling for suspected confounders. Variables which reached $p < 0.3$ were entered in to the models and analyzed at multivariate level. The final analysis was done for variables which showed a statistical significant association of $p < 0.05$ in the last model. The qualitative analysis was accomplished based on identified themes in the transcripts.

RESULTS

Result of Quantitative Data

Socio-demographic Characteristics of the Study Population

A total of 388 HCWs were selected to the study. Sixteen questionnaires were excluded which gave a non-response rate of 4.1%. One hundred thirty three (35.8%) respondents were from central/ referral hospitals and majority of them, 277(74.5%), were working in the government sector. Among the total respondents, 200(53.8%) were females. The age of respondents ranged from 18 to 60 years with a mean (SD) age of 31.70 (9.34) years and median age was 28 years.

Out of the total respondents, 320(86%) were health professionals among which 140(37.6%) were nurses. One hundred fifty two (40.9%) respondents attended up to 12 + 3 or 12+4 years of education, 274(73.7%) respondents were Orthodox Christians and singles took more than half of the share (54.3%). The mean (SD) service tenured years was 8.15 (8.68) and the median service year was 5 years. The large proportion of total service year is below 10 years (69.1%). About 75% of respondents were working in night shifts and 272(73.1%) respondents were working for 40 hours and above per week in their respective facilities.

Exposure Histories among Health Care Workers

a) Needle Stick Injuries

Among the total respondents, 142(38.2%) ever experienced at least one NSI in their entire career. Seventy one (19.1%) experienced NSI with in the last one year. Fifty four (76.1%) of them experienced the injury once and 17(23.9%) had encountered more than once with in the last one year. Based on the last one year (12 months) data, the rate of NSI was estimated as 1.34 injuries per person. The most common reason for sustaining the recent injury was due to recapping of needles. Forty six (32.4%) of the respondents sustained the injury during recapping of needle, 44(31%) experienced it due to sudden movement of the patient and 28(19.7%) during sharp collection. Immediate washing of the area with soap and water was the most commonly taken measure , by 103(72.5%) respondents. Fifty two (36.6%) exposed HCWs took HIV testing as one measure and only 10(7.0%) sought PEP.

b) Blood and other Body Fluid Splash

Blood and other body fluid (BBF) splash in to the eye, nose and/or mouth were reported by 130(34.9%) respondents in their entire work career. Seventy (18.8%) of the respondents reported BBF exposures with in the last one year. The majority, 118(90.8%), considered immediate washing with soap and water only. Only 16(12.3%) of the exposed health workers visited VCT and none of them sought PEP.

Existing Practices Related to Occupational Exposure

Only 35(9.4%) of the respondents were trained on how to report NSIs. The majority, 328(88.2%) said that they would report NSIs immediately if they encounter in the future. Forty eight (67.6%) respondents that encountered injuries with in the last one year didn't report to any responsible body or to their facilities. One hundred fifty three (41.5%) of all the respondents were ever tested for HIV at least once in their entire career. About 71% of all respondents agreed that confidentiality of HIV testing is kept at their facility. Sixty seven (18.0%) of all respondents were tested for HIV either due to NSIs or BBF splashes. About 81% of all respondents replied that they could get HIV testing at their own facility immediately after exposure. The majority, 348(93.5%) of the respondents were voluntary to be tested for HIV after occupational exposure.

Factors Associated with Occurrence of Needle Stick Injuries among HCWs: Bivariate and Multivariate Analyses

Factors associated with NSIs were assessed based on the developed conceptual framework. Logistic regression was used based on the hierarchical relationship of factors for assessing the relative effects of socio-demographic, work environment and behavioral factors on the outcome variable (occurrence of NSI). To avoid many variables and unstable estimates in the subsequent models, only those which reached a $p < 0.3$ starting from the bivariate analysis were kept in the subsequent steps (7).

Table1: Summary of Steps in the Analysis of the Effect of Socio-demographic, Work environment/organizational and Behavioral Factors on NSI.

Model	Factors	Interpretation
1	Socio-demographic factors	Overall effect of socio-demographic factors; not adjusted for work environment and behavioral factors
2	Socio-demographic + work environment factors	Effect of work environment factors adjusted for confounding role of socio-demographic factors Effect of socio-demographic factors represents that not mediated through work environment factors
3	Socio-demographic + work environment + behavioral factors	Effect of behavioral factors adjusted for confounding role of socio-demographic and work environment factors Effect of work environment factors represents that not mediated through behavioral factors Effect of socio-demographic factors represents that not mediated through work environment nor behavioral factors

The results of the regression analysis showed that strongest association was observed with being a nurse (AOR=15.39, 95%CI=3.70-18.05). Other factors which were associated with occurrence of NSIs were; having work experience for more than 10 years (AOR=2.68, 95%CI=1.30-5.54), working long hours (AOR=1.90, 95%CI=1.10-3.31), attending fewer patients per day (AOR=2.21, 95%CI=1.32-3.58), self perception of high risk HIV(AOR=2.05, 95%CI=1.10-3.82) and non-consistent use of PPEs(AOR=1.67, 95%CI=1.01-2.76) (Table 2).

Table 2: Multivariate Logistic Regression Analysis of Factors Associated with Needle Stick Injuries among HCWs, Addis Ababa, 2008. **

Characteristics	COR(95%CI)	AOR(95%CI)		
		MODEL 1	MODEL 2	FINAL MODEL
Model 1[Socio-demographic factors] #				

Work sector				
Government vs. Private†	2.05(1.22-3.43) *	2.74(1.84-3.05) *	2.54(1.89-3.11) *	2.17(0.25-3.77)
Profession				
Physician	10.22(2.80-37.24) *	11.90(2.64-53.70) *		
Nurse	14.53(4.29-22.17) *	15.04(3.45-23.98) *	14.37(3.37-19.13) *	15.39(3.70-18.05) *
HA/JN	5.61(1.34-23.57) *	4.31(0.83-22.42)		
Midwife	7.50(1.80-31.32) *	6.93(1.37-35.16) *		
Lab technician	6.87(1.85-25.48) *	7.73(1.71-34.97) *		
Cleaner	4.80(1.19-19.44) *	2.65(0.53-13.25)		
Less risky health workers	1.00	1.00	1.00	1.00
Experience (in 10 year) ‡				
≥10 vs. <10†	3.21(2.03-5.06) *	3.43(2.44-6.92) *	3.11(2.04-5.78) *	2.68(1.30-5.54) *
Model 2[socio-demographic + work environment factors] #				
No of Patients attended daily ‡				
<35 vs. ≥35†	2.08(1.27-3.48) *		2.79(1.43-6.46) *	2.21(1.32-3.58) *
Working night shifts				
Yes vs. No†	1.07(0.59-1.65)			
Hours worked per week ‡				
≥40 vs. <40†	1.76(1.07-3.26) *		3.41(1.52-6.94) *	1.90(1.10-3.31) *
Model 3[Socio-demographic + work environment + behavioral factors] #				
Perceived level of risk to HIV				
High risk vs. Low risk†	1.69(1.05-2.70) *			2.05(1.10-3.82) *
Always use of PPEs				
No vs. Yes†	1.83(1.18-2.84) *			1.67(1.01-2.76) *
Use of glove all/ most of the time				
Yes vs. No†	2.96(1.41-			2.35(0.15-

	6.23)*		5.85)
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* Significant association, $p < 0.05$ at 95%CI

Only variables reached p-value less than 0.3 were kept in the subsequent analysis, and displayed in the table (in the 3 models)

† Reference group

‡ Categories were made based on previous similar literatures.

** Some Variables, which were used in the analysis, are not shown in the above table. These include; *working place, age group, sex of respondents, educational status, perceived risk to HIV, ever trained on infection prevention, ever trained on reporting NSIs and ever communication about work place HIV/AIDS.*

Knowledge and Practice on HIV Post-Exposure Prophylaxis

Three hundred nine (83.1%) respondents were aware of the presence of HIV PEP. Seventy four (23.9%) of them ever attended trainings related to HIV PEP. One hundred twenty four (40.1%) described that they saw guidelines related to HIV PEP in their facility and 126(40.8%) saw posted posters in their facility. About 16% claimed that they couldn't get PEP starter packs in the usual working hour. Two hundred sixty four (71.0%) respondents had knowledge about HIV PEP and only 10(2.7%) ever took PEP tablets in their life time.

Factors Associated with HIV PEP Knowledge among Health Care Workers

Based on the results of the multivariate logistic regression analysis, factors associated with PEP knowledge were ever trained on universal precaution or infection prevention (AOR=2.26, 95%CI=1.08-4.72), consistent use of glove during procedures (AOR=2.44, 95%CI=1.02-5.82), Ever experience of BBF splash (AOR=2.28, 95%CI=1.01-5.15) and ever tested for HIV due to occupational exposure (AOR=7.79, 95%CI=1.48-41.04).

Result of Qualitative Data

Health care workers who encountered injuries had experienced adverse psychological feelings such as nervousness and feelings of desperation and anxiety in the hours following the accidents. They had also different concerns if they got exposed. The first concern HCWs thought about after exposure was their family. The second main concern was whether they could get enough support from their employing institution. They were also not aware or clear of any policy for occupational infections in the country. Societal discrimination was also another main concern that HCWs feared to be tested for HIV immediately after exposure. If HCWs got infected with HIV at work, people would nevertheless suspect the transmission route, which would be highly humiliating for them. Some barriers were also identified to follow PEP guidelines. Firstly, the leaders of the

facility didn't pay enough attention to occupational exposure. Secondly, HCWs were less proficient about HIV PEP. Some HCWs knew nothing about HIV PEP. Most HCWs didn't get the opportunity to attend training on HIV PEP. Lastly, HCWs were not sure about the availability of PEP medications. It revealed the gap between PEP guidelines and the actual practices among HCWs.

DISCUSSION

The prevalence and rate of NSI in this study is consistent with previous studies done in Ethiopia (8, 9). Similar studies in other countries, like Tanzania indicated that NSIs were the commonest occupational exposures among HCWs (10). A study done in Uganda (11) showed that among the nursing staff working at national referral hospital, a high rate of NSI was observed. The most common reason for sustaining NSIs in this study was due to needle recapping of needle. Despite the current national infection prevention recommendation not to recap needles, it was still a common practice. Earlier studies also indicated that the major contributing factors for NSIs were recapping of needle (8) venepuncture (8) and administering of injections (8-10).

Those who worked for 10 years or more had a higher chance of experiencing NSI compared with those who worked for less than 10 years. Earlier studies came up with different results. A study done in India indicated that increasing work experience was associated with increased occurrence of NSI. The study in Ugandan hospital, however, showed that nurses who had been in service for less than 10 years were at a higher risk of sustaining NSI compared with those with more than 10 years of experience. As experience in health facilities increases, the chance of getting NSI may also increase. It may also be related with stress and exhaustion. As it was also evidenced in other studies (9, 10) working for many years and for long hours can result in stress and emotional exhaustion, which are likely to increase the chance of human error and contribute to a tendency towards risky behaviors. Consistent with this finding, working for long hours was found to be significantly associated with occurrence of NSI. Long working hours is also an indicator of understaffing, which is a phenomenon in developing countries.

Somewhat surprisingly, a higher injury rate was found among those attending to less than 35 patients per day compared with those attending to more patients. It is possible that those who were doing invasive and operative procedures, which was usually accompanied by a higher risk for NSIs, were attending to fewer patients. Non-consistent use of PPEs was found to be associated with chance of sustaining NSI. Some earlier studies linked consistent use of PPEs with precautions in general.

HCWs who encountered injuries had experienced adverse psychological feelings such as nervousness, desperation and anxiety in the hours following the accidents. They also had concerns including their families and support from the employing institution. Research also indicated that exposure to HIV/AIDS in health care settings causes serious adverse psychological outcomes for HCWs leading to stress, burnout and dropping out of their practices. The adverse psychological outcomes they experience likely have negative effects on the quality of care HCWs provide for PLWHAs and other patients, and thus, need to be addressed.

The study indicated that about 71% of HCWs had knowledge about HIV PEP. The odds of PEP knowledge was higher among HCWs who were ever trained on universal precaution compared with those who didn't attend training. In one study (10) training was found to be the crucial factor in predicting the knowledge of HCWs about HIV PEP. This finding has also great importance for planning preventive measures for occupational exposures in our set up, where arranging proper training is a more feasible target for immediate actions after occupational exposure. From the study findings, there seemed to be a gap between national PEP guidelines and actual practices among HCWs. Trainings may also be needed to ensure that HCWs fully understand the standard procedures of PEP so that in case of exposure they will know what to do, where to get treatment and where to report. Lack of institutional support was found to be an important barrier for HCWs compliance with taking PEP.

CONCLUSION

Occupational exposures were common among health care workers in the study health facilities and recapping of needle was considered as the most common reason for sustaining NSIs among the exposed HCWs. Only 9.4% of respondents were trained on how to report NSIs and the majority of exposed health workers didn't report their injury. The most common reason given was not giving a concern for the issue. HCWs who encountered injuries could also experience adverse psychological feelings and have many concerns. About 71% of respondents had knowledge about HIV PEP and majority of them could get PEP medication in the working hour in their facility. However, only very few exposed HCWs took PEP tablets.

RECOMMENDATIONS

From the findings of the study, the following recommendations were forwarded:

1. Put in system that encourages health care workers to wear personal protective devices through accessing and supplying standard materials to the services delivered in the health care facility for compliance to universal precaution.
2. Health facilities should make available with in their system a standardized written protocol for infection prevention and reporting unit for management of occupational exposures so that health care workers will know how and where to report.
3. Attention should be paid to reducing heavy work loads and adequate in-service trainings, including monitoring of procedures.
4. Auxiliary staffs should also be involved in in-service trainings related to infection prevention.
5. There is a need to implement a work place program that can address the psychosocial burden health workers face after exposure.
6. A mechanism should be established in order to avail PEP drugs during duty hours, weekends and holidays complemented with appropriate counseling and testing of HIV for immediate use by HCWs.
7. Similar studies that include assessment of the magnitude of HIV due to occupational exposure among HCWs are needed.

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THESIS- SEVEN

HIV Sero Status Disclosure among Clients Attending ART Clinics in Bahir Dar, Amhara National Regional State

Bezie Mekonnen

ABSTRACT

Background

The United Nations Population Fund has declared HIV/AIDS is a young people's disease. Individuals between the ages of 15 to 24 years are infected every 14 seconds. Disclosure is an important factor in HIV/AIDS prevention interventions. Disclosure of one's HIV status enables for improved access to prevention and treatment programs, provides increased opportunities for risk reduction and helps in planning for the future.

Objective: The study is aimed at determining the rates, barriers and outcomes of HIV sero status disclosure among clients attending ART clinics in Amhara National Regional State, Bahir Dar Town

Method : A cross sectional study design that employed quantitative data collection method supplemented by qualitative in depth interview was conducted on a sample size of 374 study subjects selected by convenient sampling procedure. Coding, entry & statistical analysis was done using SPSS & EPI Info statistical software.

Result: While the overall disclosure rate in this study was 87.2%, while disclosure to sexual partner is found to be 79.3%. 307(93.8%) of those who have disclosed replied that they are benefited from doing so. These respondents also indicated that improved health care 210(64.4%) and improved social support 133(40.7%) were the two most encountered benefits. Those who suffered the negative outcomes of disclosure indicated that stigma and discrimination were the two most frequent consequences they suffered from (55% and 40% respectively) Analysis of the reasons for non disclosure found that stigma, discrimination and violence were the three most common perceived consequences with frequencies of 37(77.1%), 16(3.3%), and 9(1.9%) respectively. The study also found that sex and marital status are the two variables associated with HIV sero status disclosure (p.values 0.034 and 0.0000, respectively)

Conclusion: This study indicates that the perceived barriers to disclosure are not actually occurring among those who have disclosed. The study also shows that disclosure is rather accompanied with valuable benefits. Therefore it is important to encourage HIV positive individuals to disclose their test result to significant others. Other large scale studies shall also be conducted to consolidate these findings

INTRODUCTION

The United Nations Population Fund has declared HIV/AIDS is a young people's disease. Individuals between the ages of 15 to 24 are infected every 14 seconds. That means a total of 6,000 people a day are being infected with HIV. Disclosure is necessary in order to prevent the spread of AIDS (1). Sero status disclosure eliminates the disease associated with hiding the situation. That means, people who disclose their HIV sero status are more comfortable, confident and will not have fear on further disclosure.

There is increasing recognition that disclosing one's HIV status is an essential part of behavior modification required to reduce the incidence of HIV. Voluntary counseling and testing for HIV is widely promoted as an important first step in behavior modification. However, without disclosure, few of the benefits can be realized. For example, a study done in South Africa showed that knowing someone with HIV was associated with condom use at last sexual contact and negatively associated with multiple and casual sex partners. Another study done in Thailand also found that those with histories of contact with people living with HIV/AIDS have more tolerant attitudes toward the disease as well as to those infected. Disclosure is also fundamental in managing HIV, especially in terms of adhering to complex treatment regimens. For example, HIV-positive people have reported that they sometimes skipped doses because they could not take a prescribed medication without being observed doing so. Disclosure of HIV status has become an entry criterion for many treatment programs in resource constrained settings. Access to other forms of care such as home based care and specific social grants are also dependent upon the disclosure of HIV status (2).

In developed countries the disclosure rates to sexual partners were quite high, ranging between 42% to 100%, depending in large part on the type of sexual partner to whom the person disclosed. The rates of disclosure among the studies from the developing world were notably lower than rates reported from the developed world. The rates ranged from 16.7% to 86%. The most common barriers to disclosure that were mentioned by participants included fear of abandonment, fear of rejection/discrimination, fear of violence, fear of upsetting family members and fear of accusations of infidelity(3).

Most studies both in developing and developed countries reported that positive outcomes were common following disclosure. Positive outcomes reported by women included increased support, acceptance, and kindness. Disclosure was associated with less anxiety, fewer symptoms of depression, and increased social support. For the most part, negative outcomes affected a small percentage of respondents. Negative outcomes included blame, abandonment, anger, violence, stigma, and depression (4).

Studies done on HIV sero status disclosure in Ethiopia are either inadequate or are hard to access. Therefore, this study would give highlights on HIV sero status disclosure in Bahirdar Town.

METHODS AND MATERIALS

A cross sectional quantitative study design supplemented by qualitative indepth interview was conducted from December 2007 to January 9 /2008 in the Amhara National Regional State, Bahirdar town. While the HIV prevalence rate of the region was 4.5 percent, the prevalence rate of Bahirdar town was 13.6 percent. The source population for this study was PLWHA in Bahirdar town and the study population was all PLWHA who are attending ART clinics in the selected ART sites. Using the formula for single population proportion, adjusting for size of the study population and adding 10% non response rate 384 study subjects were selected by applying convenient technique. Sample size for the qualitative method was determined by the point of saturation. All data were summarized on master sheet and then coded and entered in to the computer. The data coding, entry & statistical analysis was done using SPSS & EPI Info statistical soft wares.

RESULT

Sociodemographic characteristics

A total of 374 respondents (165 males, 209 females) whose ages were 15 years and above were included in the study making the response rate to be 97.4 percent. The majority(40.6%) were in the age group 25-34 years, 62.5% were literates, 90.1%were orthodox by religion and 96.8% were amhara by ethnicity. In addition 94(25.1%)of the respondents were daily labourers by profession.

Table 1: Socio demographic characteristics of respondents, Amhara national regional state, Bahirdar town, January 2008

VARIABLE	FREQUENCY	PERCENT
Sex		
Male	165	44.1
Female	209	55.9
Age		
15-24	39	10.4
25-34	154	41.2
35-43	130	34.8
44-53	40	10.7
54+	11	2.9
Educational status		
Literate	219	58.5
Illiterate	155	41.5
Religion		
Orthodox	337	90.1
Other Christian	11	2.9
Muslim	26	7.0
Ethnicity		
Amhara	362	96.8
Others	12	3.2
Marrital status		
Married	154	41.2
Single	53	14.2
Widowed	81	21.7
Divorced	66	17.6
Non Married partner	20	5.3
Occupation		
Jobless	47	12.6
Student	14	3.7
House wife	45	12.0
Daily laborer	94	25.1
Merchant	28	7.5
Government employee	68	18.2
Private employee	62	16.6
Others	16	4.3

Disclosure status and ART use

Three hundred fourteen (84%) of the study subjects were on HAART. While the over all disclosure rate was 87.2%, disclosure to sexual partner was found to be 79.3%. 142 (43.5%) of the respondents disclosed 6 months past their time of diagnosis, 97(29.7%) disclosed within 6 months of their diagnosis. Analysis of the health condition of the respondents at the time of disclosure revealed that while 97(29.8%) were healthy,the remaining 229(70.2%) of them were sick.

Reasons and outcomes of disclosure;

Tables 2: Disclosure status and health condition at the time of disclosure, Amhara national regional state Bahirdar town, January,2008

Duration of HIV Diagnosis		
<6 Months	115	30.7
>6 Months	193	51.6
Do not know	66	17.6
Started ART		
Yes	314	84
No	60	16
Disclosure to any one		
Yes	326	87.2
No	48	12.8
Duration of disclosure since Diagnosis		
<6 Months	97	29.7
>6 Months	142	43.5
DK	87	26.7
Health condition at disclosure		
Healthy	97	29.8
sick	229	70.2

Desire for social support 183(56.1%) and concern for partner health 138 (42.3%) were the two most reasons cited for disclosure. 306(93.8%) of those who have disclosed replied that they are benefited from doing so. These respondents also indicated that improved health care 210(64.4%) and improved social support 133(40.7%) were the two most encountered benefits. Those who replied that they are not benefited from disclosure indicated that stigma and discrimination were the two most frequent consequences they suffered (40% each).

Table 3; Reasons and out come of HIV sero status disclosure, Amhara national regional state Bahirdar town, January 2008

Variable	Frequency	Percent
Disclosed to ☺	138	42.3
Partner	75	23.0
Mother	43	13.2
Father	86	26.4
Brother	79	24.2
Sister	61	18.7
Children	45	13.8
Others		
Reason for disclosure ☺		
Concern for partner health	138	42.3
Get social support	183	56.1
Concern for society	105	32.2
Benefited from disclosure		
Yes	306	93.8
No	20	6.2
Type of benefit ☺		
Improved social support	133	40.7
Improved healthcare	210	64.4
Partner protection	64	19.6
Decrease anxiety	117	35.9
Decrease depression	6	1.8
Others	49	15.0
Negative outcomes of disclosure		
Violence	4	20.0
Discrimination	8	40.0
Stigma	8	40

☺ multiple answers

Feelings and reasons for non disclosure

The majority 118(36.2%) of those who have disclosed stated that they were afraid to disclose fearing stigma, discrimination, or violence. But only 20 (17%) of these respondents indicated that their fear was realized. Stigma, discrimination and violence were also the three most common reasons for non disclosure with frequencies of 37(77.1%),16(3.3%),and 9(1.9%), respectively.

Table 4; Feelings just before disclosure and reasons for non disclosure of HIV status Amhara national regional state Bahirdar town, January 2008

Variable	Number	Percent
Afraid to disclose		
Yes	118	36.2
No	208	63.8
Type of fear to disclose ☺		
Stigma	105	89.0
Violence	27	22.8
Discrimination	56	47.4
Others	4	3.3
Fear realized		
Yes	30	25.4
No	88	74.6
Reasons for non disclosure ☺		
Stigma	37	77.1
Violence	9	1.9
Discrimination	16	3.3
Shame to family	5	10.4
Others	6	12.5

☺ multiple answers

Sexual behaviour and condom use

With regards to partner status, 108(62.2%) of the 174 respondents have a had positive partners while 35(20%) of them had partners whose HIV sero-status was negative. When asked about their sexual behavior, 138(79.3%) respondents replied that they practice sex with their partners, while the rest 36(20.7%) replied that they do not. Of the 138 individuals who do sex with their partners 99(71.7%), replied that they use condom for a Varity of reasons, while 39(28.3%) of them indicated that they do not use condom. Five (12.9%) of these respondents (those who do not use condom) have a partner whose sero status is negative. Partner rejection, partner's positive status, and lack of pleasure were some of the reasons cited for their non use of condom.

Table 5: Distribution of married respondents by sexual behaviour and condom use, Amhara national regional state Bahirdar town, January 2008

Variable	Frequency	Percent
partner status		
Positive	108	62.1
Negative	35	20.1
Do not know	31	17.8
Sex with partner		

Yes	138	79.3
No	36	20.7
Condom use		
Yes	99	71.7
No	39	28.3
Pattern of condom use		
Persistently	82	82.8
Always	7	7.0
Some times	10	10.2
Reason for condom use ☺		
Partner negative	21	21.2
Protect pregnancy	76	76.8
Protect STI	56	56.6
Others	14	14.1
Reasons for non use of condom ☺		
Lack of pleasure	5	12.8
Partner positive	10	25.6
Reject by partner	17	43.6
Others	13	33.3

☺ multiple answers

Table 6: Factors associated with disclosure of HIV sero status, Amhara national regional state Bahirdar town, January 2008

	Disclosed				
	number	%	number	%	
Sex					
Male	137	42.0	28	58.3	0.52(0.27, 0.99)
Female	189	58.0	20	41.7	
Education					
Illiterate	102	31.3	17	35.4	0.83(0.42, 1.65)
Literate	224	68.7	31	64.6	
Religion					
Christian	301	92.3	47	98.0	0.26(0.01, 1.84)
Muslim	25	7.7	1	2.0	
Marital status					
Married	138	46.3	36	6.3	0.24(0.12, 0.51)
Others	188	53.7	12	93.7	

Monthly income					
<500	270	82.8	43	89.6	0.56(0.19,
>500	56	17.2	5	10.4	1.56)

Factors associated with disclosure

Sex is found to have a statistically significant association with disclosure (OR 0.52, 95%CI 0.27, 0.99). The table also indicates that marital status is significantly associated with HIV sero status disclosure (OR 0.24, 95% CI 0.12, 0.51).

QUALITATIVE STUDY

To supplement the quantitative method, a qualitative in depth interview(IDI) was made using 20 informants who disclosed and 10 informants those who did not disclosed. The findings of the IDI was in line with the quantitative findings. With regard to the outcome of disclosure for example, while most of the interviewees replied that they are benefited from disclosure, few 3(15%) replied that they have suffered, mainly discrimination and stigma, from disclosing their test result. This stigma and discrimination was mainly from house renters and neighbors than relatives. One of the interviewees described the discrimination she faced because of disclosing her HIV status. "Before I disclosed my status to my house renter, we used to have coffee ceremonies together and enjoy it". She continued, "But after I disclosed my status to them, either they do not invite me or come to my home during such ceremonies, or they will put my coffee cup separately so that they do not mistakenly use mine"(A 30 years old house wife).

DICUSSION

There is increasing recognition that disclosing one's HIV status is an essential part of behavior modification required to reduce the incidence of HIV. Voluntary counseling and testing for HIV is widely promoted as an important first step in behavior modification. In this study the overall HIV sero status disclosure rate was 87%.The study also found that among the respondents who has partners the 138(79.3%) had disclosed their HIV status to their sexual partner. This rate of HIV sero status disclosure to sexual partner is much higher than other similar studies. For example, a study done by Antelman (2001) in the United Republic of Tanzania found that disclosure to sexual partner was 41% (4). A similar study done by Kebede Deribe etal (2005) among women in Metu and Gore towns. In Illubabor Zone South West Ethiopia found that the HIV sero status disclosure rate was only 69%(6).This difference in the rate of disclosure to sexual partner may mainly be attributed to the year of study ; the studies by the two researchers were done before 2005 where stigma, discrimination, and violence were major barriers to disclosure. This study

also found that 70.2% of those who have disclosed were sick at the time of disclosure. This shows that health condition has a direct relation ship with disclosure. Analysis of the benefits of disclosure among the respondents who have disclosed their status showed in this study that while the majority (93.8%) are benefited from disclosing their result, 20(6.2%) of the respondents suffered the negative out comes of disclosure. These negative out comes were stigma and discrimination (40%) each, and violence (20%). These findings are also supplemented by the qualitative interview. In the study done by Kebede Deribe, et al they found that negative out comes were 24.1%. This difference in negative outcome of disclosure between the two studies may still be attributed to the timing of the study (discussed above) and the study subjects in that the researchers studied only of female sex, while this study is on both sexes, who are more likely to suffer the negative out comes than males. In this study 118(36.2%), of the 326 respondents who disclosed their HIV status, were anxious to disclose for fear of stigma, discrimination, or violence. But, the result showed that it was only among the 17% of these respondents that the fear was realized. A similar study by Heyward in Kinshasa, Democratic Republic of Congo found that 63% of the women did not disclose their HIV status for fear of divorce. Yet at 12 months after disclosure no women in the study reported divorce or separation.

Therefore, we can learn from this scenario that not disclosing ones sero status for fear of the negative outcomes, while it is less likely to occur, will take away the benefits one would get from disclosing his/her status. It is also evident from this study that 48(12.8%) of the respondents disclosed for no one. Some of the reasons for their non disclosure were stigma, discrimination, violence and causing shame to family. These are anticipated barriers that are highly less likely to occur as discussed above. The fact that 13% of the study subjects did not disclose means that they may not protect the people with whom they are living with and hence may share sharp instruments or use no condom during sexual act. This study also found out that out of the 138 respondents who had sex with their that, 39(28.3%) replied that they do not use condom with their partners during sexual practices. Partner rejection and similar status with partner were the two most common reasons (43.6 and 25.6% respectively) for their non use of condom. The astonishing part of this finding is that the HIV status of 5(12.8%) of the non condom users are negative (discordant), and yet they continue doing sex without condom. The common reason given by these discordant for their non use of condom was partner rejection. This is an indication that some of the people have not yet developed behavioral change towards prevention and control of the disease. This will certainly affect the efforts that people are making to control the pandemic.

CONCLUSION

It is evident from this study that even if the overall disclosure rate seems high (87%), the remaining 13% of the study subjects did not disclose their status to anyone. The study also found that stigma, discrimination, and violence were the main barriers to HIV sero status disclosure. This study also found that even if people are not disclosing their HIV positive status mainly due to fear of stigma, discrimination, and violence the truth is contrary to this and the majority of those who have disclosed their HIV positive status are enjoying the benefits of disclosure. This study also found that some of the study subjects did not use condom even if their HIV status is different from their partners'. It was also found in this study that sex and marital status are the two variables significantly associated with disclosure.

RECOMMENDATION

1. Measures, like professional counseling and health education have to be strengthened towards improving the rate of HIV positive status disclosure;
2. The government and other stakeholders have to work with the society towards decreasing, if not eliminating, for stigma and discrimination;
3. The HIV carriers have to use condom during any sexual act regardless of the HIV status of their partners;
4. The clients rights for a better health care and drug access has to be intensified;
5. Further studies be conducted to verify the findings and see the changes over time

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THESIS-EIGHT

Assessment of Quality of Antiretroviral Therapy Service in Felege

Hiwot Hospital Bahir Dar

Almaz Teshome

ABSTRACT

Background: Providing quality of care in ART service is an important task for care providers to increase service utilization and to respond to the HIV emergency; however, little is known about the existing quality of care in ART services in Ethiopia.

Objective: The aim of this study was to assess the quality of ART service provision in Felige Hiwot Hospital, Bahir Dar.

Methods: A cross sectional quantitative study which is supplemented with a qualitative research method was conducted from Nov- Dec /2007. A total of 422 Adult PLWHA on ART for at least 3 months were the study participants. Data were collected using structured questionnaire, check lists and semi- structured interview guide. After clearing and checking for consistency data was coded, entered and Univariate & Multivariate analysis was carried out using SPSS version 15.0. Qualitative data was transcribed & narrated under themes.

Results: structure & process result reveals that most of the requirements are fulfilled except some limitations. Regarding client satisfaction, 31.3% of the clients claimed they wait more than or equal to half an hour to get ART service in the hospital and over all client satisfaction & patient-provider relationship satisfaction rate were 70.9% and 100% respectively. In relation to adherence to ARV treatment, overall prevalence of adherence at $\geq 95\%$ while the requirement by self report method was 92.4%. Duration on treatment was significantly associated with adherence. Patients who were on treatment for 13-24 months were found to be more adherent [OR 8.145, CI 95% 1.032-64.263] than patients who were on treatment for 3-6 months.

Conclusion and Recommendation: The result of this study showed that Quality of ART service in Felige Hiwot Hospital is satisfactory. The structure and process requirement of the ART service almost fullfills the minimum requirements for implementation of ART in

Ethiopia, except some limitations. On outcome indicators; client satisfaction and adherence of clients to ART were high. However, to achieve the goal of ART and its impact; addressing functional equipment & supplies in laboratory package and working with religious & community leaders to strengthen adherence status are recommended.

INTRODUCTION

Ethiopia is among the countries most heavily affected by the HIV epidemic [3]. The cumulative number of PLWHA is about 977,394, with 64,813 children under 15 years of age. According to single point HIV prevalence estimate, the national prevalence rate is 2.1% (MOH, 2007) with 7.7% in the urban and 0.9% prevalence in rural [4]. The same literature revealed that, there are an estimated 125,528 and 14,148 new HIV infections in the adult and children population, respectively. Annually, 71,902 adults and 10,825 children have died of AIDS and currently 258,264 adults and 15,716 children need antiretroviral treatment. Bahardar, which is the capital city of Amhara region is one of the hardest hit towns by the HIV/AIDS epidemic. According to AIDS in Ethiopia 6th report of the MOH (sept.2006), HIV prevalence of Bahar Dar Felige Hiwot Hospital (Based on ANC – surveillance) was 14 % [5].

Although the current HIV/AIDS surveillance estimates indicate some encouraging signs in that the epidemic is stabilizing, the observed changes are not sufficient enough compared to the desired goals of the response against the epidemic [5]. In light of this, the country's plan to respond to the HIV/AIDS emergency cannot be achieved without adequate focus on improving quality of care or treatment. Even if the government of Ethiopia is working to scale up ART service, little has been done to evaluate the quality. The purpose of this study is to assess the Quality of ART service in Bahar Dar Felige Hiwot Hospital.

METHODS

A cross sectional quantitative study which was supplemented by a qualitative research method was carried out in Felige Hiwot Hospital- Bahirdar from Nov-Dec/2007. According to I-TECH Bahir dar ART center report (up to Tikemet 30/2000 E.C) there are 6890 ever enrolled, 5321 ever started and 3132 PLWHA currently on ART in Felige Hiwot Hospital. All adult people living with HIV/AIDS (PLWHA) who were currently on antiretroviral therapy in Felige Hiwot Hospital Bahir Dar were source population and the study subjects were adults ≥ 18 years and who have been on treatment at least for three months. All eligible Subjects who were found during the data collection period were included until we got the intended sample size. As far as and for professionals are concerned all professionals working on ART were included. The required sample size was determined by using single

population proportion formula considering the Proportion of 50% (50 % was taken because there is no previous studies that show quality of ART service), Level of significance 0.05, Margin of error (d) 5%, Non-response rate 10%, with this a sample size of 422 PLWHA on ART were calculated. The questionnaire was developed by reviewing literatures was developed based on the National ART implementation guideline.

The questionnaire was pre-tested among 10 % of the total sample of PLWHA on ART, at one of the health centers in which ART service is being implemented, and corrections were made accordingly. Open ended Semi structured in-depth interview guide was prepared to probe ART service providers view. The collected questionnaires were checked for completeness, consistency as well as coded and entered to SPSS version 15.0. Then data cleaning was performed to check for accuracy and consistencies. Data analysis for assessment of structure and process of the ART services was made based on the checklist result. To measure client satisfaction, 25 item questions which include view of clients on accessibility of the service, patient provider interaction, overall satisfaction, recommendation of the service for other clients and attitude of clients on the location of ART service were used. Satisfaction of clients on patient provider relationships was computed based on 12 Questions and patients who scored above to the mean considered as "Satisfied" and patients who scored below and equal to the mean score considered as "Unsatisfied". Overall satisfaction rate of clients were assessed with likert type of questions with five point scale and "poor" and "fair" responses were considered as "poor quality" and responses with "good", "very good", and "Excellent" were considered as "good quality" and computed with five questions. Mean score was calculated, patients who scored above the mean were considered as "Satisfied" and patients who score below and equal to the mean considered as "Unsatisfied". Regarding Adherence to ART; any skipping of doses in the previous 7days, in the previous month and ever started missed doses were assessed and adherence rate was calculated based on the 7 days dose adherence and translated quantitatively into percent adherence by the following formula:

$$\frac{\text{Doses which should be taken} - \text{missed doses}}{\text{Doses which should be taken}} \times 100$$

Doses which should be taken

Descriptive statistics was done to compute frequencies, bivariate analysis was done to explore association of dependent and independent variables. To control the effect of confounders, multivariate logistic regression was used. For the in-depth interview, data was transcribed, put under theme and narration was made.

Before the fieldwork, ethical clearance was obtained from Faculty of Medicine, Addis Ababa University. A formal letter of cooperation was requested from Felegi Hiwot Hospital Administrative office to contact the ART center and consent was obtained from the ART center staffs and from patients.

RESULT

Socio-demographic Characteristics of the respondents

A total of 422 PLWHA on ART were participated with a response rate of 100%, of which over half 247(58.5%) were females. The mean age of the respondents was 33.8 ± 8.39 (range 18 to 70 years). The dominant age group was 30 to 39 years accounting to 179(42.4%) of the study participants.

Client satisfaction on ART service

The mean patient provider relationship satisfaction rate was 18 and all 100% of the respondents score above the mean which means 100% satisfied relationship with their care providers and the mean overall satisfaction of clients on quality of ART service score was 2.5 .Two hundred ninety nine (70.9%) respondents who score above the mean considered as "Satisfied"(good quality) and 123(29.1%) respondents who score below &equal the mean considered as "Not satisfied"(poor quality) with the quality of the ART service provided (Table 1).

Table 1 Clients satisfaction on ART service, Felege Hiwot Hospital, Bahir dar, 2008.

Variables(n=422)	percent
Time spent to get ART service	
<1/2 hour	54.3
½ to 1 hour	18.0
61 min-2 hr	12.3
> 2 hr	15.4
Convenience of opening hours	
Yes	98.1
No	1.9
Waiting time to get ART service	
<1/2 hr	68.7
≥1/2 hr	31.3
Feeling of clients about waiting time	
Short time	89.8
Long time	10.2
Patient provider relationship satisfaction	
Satisfied	100 0

Unsatisfied	
Quality of service satisfaction	
Good	70.9
poor	29.1

When adjusted odds ratio was calculated among variables which had association and confounders, significant association was found only between client satisfaction and sex, educational status, and occupation .The odds of dissatisfaction of females were found to be 1.8 times that of the odds of the dissatisfaction of males.[OR 1.889,CI 95%1.057-3.378], the odds of dissatisfaction of clients who had completed secondary school education were found to be 2.265 times that of the odds of dissatisfaction of illiterates[OR 2.265,CI 95%1.204-4.260] and the odds of dissatisfaction of house wives were found to be 0.35 times that of the odds of the dissatisfaction of government employees[OR 0.350,CI 95%0.160-0.767]

Table 2. Multivariate Analysis of satisfaction of clients on ART service in Felige Hiwot Hospital, Bahir dar, 2008.

Variable	satisfaction		Adjusted OR	P-Value
	Yes (n, %)	no (n, %)	[95% CI]	
Sex				
Male	131(43.8%)	44(35.8%)	1	
Female	168(56.2%)	79(64.2%)	1.889[1.057-3.378]*	0.032
Educational status				
Illiterate	91(30.4%)	34(27.6%)	1	
Write &read				
Only	31(10.4%)	4(3.3%)	0.348[0.104-1.163]	
(1-6)	52(17.4%)	21(17.1%)	1.619[0.715-3.663]	
(7-12)	81(27.1%)	54(43.9%)	2.265[1.204-4.260]*	0.011
12+1&above	44(14.7%)	10(8.1%)	0.465[0.186-1.160]	
Occupation				
Gov't employee	67(22.4%)	38(30.9%)	1	
Private	50(16.7%)	17(13.8%)	0.377[0.164-0.868]*	0.022
Merchant	62(20.7%)	26(21.1%)	0.904[0.460-1.775]	
Unemployed	13(4.3%)	8(6.5%)	1.385[0.480-3.989]	
Housewife	51(17.1%)	12(9.8%)	0.350[0.160-0.767]*	0.009
Student	7(2.3%)	2(1.6%)	0.456[0.078-2.678]	
Prostitute	3(1.0%)	3(2.4%)	4.736[0.792-28.305]	
Daily laborer	46(15.4%)	17(13.8%)	0.816[0.377-1.769]	

KEY-* significant association

1 -reference group

Health professionals were asked for any possible reason for client dissatisfaction on the ART services; all of the participants mentioned lack of OI drugs, absence of CD4 count machine, long waiting time [due to shortage of human power and patient over load]could be the possible reasons for dissatisfaction of clients. Concerning lack of CD4 count machine in the hospital, one nurse counselor said that “.....regional laboratory collect samples in the morning up to 4 o'clock and patients who reached after this time appointed for the next day and even after, so they face difficulty to pass the night”.

Adherence to ART

Among 422 study subjects, CD4 count was available for 418 patients (four clients started treatment based on WHO clinical staging). Out of these 219 (51.9%) of the study participants had ≤ 200 . The mean recent CD4 count of the participants was $218.2 \text{ s.d } \pm 140.2$, with the range of 1 to 742 . Around 107(25.4%) of the participants had been on treatment for about 3 to 6 months. The average length of time on ARV treatment for all participants was 14.4 months, ranging from 3 to 51 months. Regarding time schedule of ARV treatments, 106(25.1%) of respondents replied they had difficulty of attachment with the schedule due to forgetfulness and being busy by other life issues.

Adherence was measured using self report method at different recall times; 7 days, previous 1 month, and ever started doses. Out of the total PLWHA interviewed 92.4% of them reported having complied to $\geq 95\%$ of their drugs prescribed in the past 7 days (adherent to ART drugs) and the rest 7.6% of them were non adherents. Among those who had ever missed a dose or more 57(13.5%) attribute their reason to religious belief particularly Holy water, while 34(8.1%) to simply forgetting ,25(5.9%)to travelling away from home and illness on treatment, and 21(5.0%) and 20(4.7%) of the respondents missed their drugs to avoid side effects and problem related to sharing to family/friends, respectively.

Table 3 Duration on Treatment, CD4 count, and adherence Measurement of ART clients, FelegeHiwot Hospital, Bahirdar ,2008.

Variables	Frequency.	percent
Duration on ART(months)		
3-6	107	25.4
7-12	122	28.9
13-24	141	33.4
≥ 25	52	12.3

Recent CD4 Count(n=418)		
≤ 200	219	51.9
>200	199	47.2
Delay in time		
Yes	106	25.1
No	316	74.9
Dose missed within the last one Month		
Yes	58	13.7
No	364	86.3
Dose Adherent within the last 7 Days		
Adherent	390	92.4
Nonadherent	32	7.6
Dose missed ever started ARV		
Drugs Never skip medication		62.6
≥one dose	264	37.4
Dose missed on weekends	158	
Yes	14	3.3
No	408	96.7

Binary logistic regression was seen between background variables and adherence status. Adherence to ART was significantly associated with marital status [OR 2.662, 95% CI 1.034-6.851], occupation [OR 0.100 CI 95% 0.013-0.781], waiting time [OR 0.423 CI 95% 0.205-0.875]. When the associated variables were adjusted with other confounder variables at 95% CI, only duration on ART was found to be associated significantly with Adherence. Patients who were on treatment for 13-24 months were found to be more adherent [OR 8.145, CI 95% 1.032-64.263] when compared with patients who were on treatment for 3-6 months.

Some of the reasons which were mentioned by health professionals as a reason to miss /discontinue ARV drugs by patients were; drug side effects, OI development, holy water

,poor adherence counseling service, lack of knowledge of patients, forget fullness, social problems, being without support, coming from out of the catchment areas, religion, fear of stigma and discrimination, disclosure problems, inadequacy of the training, lack of CD4 machine, shortage of human power compared to patient flow[70 refill/day,10-15 new patients/day].

STRUCTURE AND PROCESS

Structure and process of the ART service were assessed based on the guideline for implementation of ART in Ethiopia. According to the guideline, one of the essential criteria for a facility to be accredited before implementing an ART program is meeting the minimum requirements for clinical, pharmacy & laboratory services (Table 4).

Table 4 Distribution of clinical, pharmacy, laboratory minimum package in Felige Hiwot Hospital, BahirDar, 2008.

I-Clinical service minimum package

	Requirement at regional hospital	Result in Felige Hiwot Hspital
Infrastructure	-Examination room -one ART confidential counseling room	-five examination rooms -two ART counseling rooms
Equipment and supplies	-Exam tools supplies ophthalmoscope,	Not available
	otoscope,	Yes one
	Stethoscope,	Yes eight
	BP cuff	Yes two
	reflex hammer	Not available
	-supplies(gloves, tongue blade)	Yes adequate
Human resources	Two ART trained MD	Two MD trained on ART
	Two ART trained nurse	Six HANS, one ART ,one pediatric ART nurses.
	One data clerk	One data manager
M&E/MIS	-log book	-yes
	-recording/reporting forms	-yes
	-special ART prescription	Yes
	-lockable filing cabinets	-computer system
Services	Comprehensive HIV services (STI,OI,TB,VCT&palliative care)	-yes

Referral systems	Referral slip, feed back forms, receiving & disposition slips	-yes
Manuals & guide lines	Guidelines for the implementation of ART, ARV RX guide line, PMTCT, OI, STI, VCT, infection prevention, PEP	-yes
	Diagnostic Protocols -patient selection steps, Procedures Referral system	-yes

II-Pharmacy service minimum package

	Requirement at regional hospital	Result in felige hiwot hospital
infrastructure	-on site pharmacy -secure storage space -confidential counseling room or space	-yes -yes -the same room used for counseling
Equipment & supplies	-refrigerator	-yes
Human resource	-two ART trained pharmacy staff	-yes, seven pharmacy staff
M&E/MIS	-drug supply & management system (bin card, stock card, receiving voucher, models, prescription forms, registration books, report forms) -lockable drawer	-ARV drug adequate -occasional shortage on OI drugs -yes -computerized system

III-laboratory service minimum package

	Requirement at regional hospital	Result in felige hiwot hospital
infrastructure	-specimen collection area -two additional rooms	-no private laboratory room for ART service
Types of tests	Full blood count, AFB smear, gram smear, O&P, malaria smear, pregnancy test, serology for	-yes

	HIV,VDRL* -Indian ink -clinical chemistry(BUN,CR)** -LFT** -CD4 count	Not available Yes Yes Not available
Equipment /supplies	-sterilizing equipment -microscope Refrigerator Centrifuge Test kits Reagents Hematology auto analyzer*** Clinical chemistry auto analyzer** CD4 count machine	Yes Yes , five(one ART) Yes three Yes one Yes, capillus shortage Yes yes yes not available
Human resources	-two trained laboratory staff	-yes
M&E/MIS	-log book,recording /reporting forms -lockable drawer	-yes Computer used

Remark -* = not available starting from last month due to surveillance for ANC. ** =not functioning for the last six months

*** =not functional for the last six months but now its functional.

Participants were asked about the kind of training they attended to give ART services ,all of the nurses expressed that they were trained on basic ART and HANS, which includes VCT,STI,OI management, TB, PEP, PMTCT and palliative care which was given for 7 and 21 days respectively and infection prevention for 7 days. Nearly half of the participants were repeatedly commenting that it was not adequate, since the training time was short and it was not in detail. One of the participants mentioned that

.....we had difficulties to give services on management of STIs, OIs and pediatric ART, which are common problem in HIV patients, it was better if we get refreshment courses.

DISCUSSION

According to Donabedian, **A. quality frame work [15]**: quality of care determined under three categories; structure, process & outcome. In light of this, this study attempts to assess the quality of ART service provided in Felige Hiwot Hospital in terms of structure, processes & outcome (client satisfaction, adherence).

I-structure and processes

The clinical package in the ART unit fulfills the minimum requirements which are proposed by the guideline for implementation of ARV therapy in Ethiopia. However, the training was inadequate to deliver the service as mentioned by the health providers in the interview part. Consistent with this, in a research which was conducted in North West Ethiopia, nearly half of the respondents reported that the basic training was inadequate or they were unable to make a judgment on the adequacy of training [30]. Regarding pharmacy service minimum requirement, the check list revealed occasional shortage in OI drugs like co-trimoxazole & fluconazole. Comparable with this, on a research which was conducted in Addis Ababa 2.5% of the clients reported dissatisfaction with the availability of drugs & supplies [31]. Similarly, in a research which was conducted in South central Ethiopia, essential drug supply for maternity care, FP& child hood immunization was deficient in most of the health institutions [32].

Though the National ART implementation guideline at regional level proposes to have a separate laboratory room as a minimum requirement, the result revealed that there is no separated laboratory room in Felige Hiwot Hospital, and CD4 machine is not available, and most of the laboratory equipment & supplies had technical problems. Shortage were seen in some laboratory test kits, such as; capillaries that are necessary for ART services. Consistent with this, a research which was conducted in south central Ethiopia to assess structural quality of reproductive health service revealed that, important laboratory tests were very rarely available in the health institutions. The same researcher showed that only one (1.4%) health station had VDRL tests. Urine analysis was done in less than 10% of the health institution [32].

Even if the finding is supported by literatures and it is not uncommon to see services with shortage of equipment and supplies in developing countries like Ethiopia, immediate action should be undertaken. Lack of CD4 count machine, deficiency of laboratory equipment & tests are some of the obstacles for the program creating dissatisfaction & hindering clients to comply with their medication as confirmed by the in depth interviewees.

II-Client satisfaction on ART service

Regarding waiting time, the study revealed that 31.3% of the respondents claimed they were waiting for $\geq 1/2$ hours to get ART service. In line with this, a study that conducted in

Addis Ababa [31] showed that 46.6% of the clients wait for more than one hour before they get the service. Long waiting time to get the service was also supported by the result of the in depth interview, in which almost all of the participants mentioned that long waiting time as one of the reason for client dissatisfaction . Similarly, in a research which was conducted in Jimma, 47% of the clients reported long waiting time to get services as one of a reason for clients dissatisfaction [31].consistent with this another study also revealed that sixty –nine(10.9%) clients expressed dissatisfaction with waiting time .

This study has found patient provider relationship satisfaction rate to be 100%,which is comparable to another study which was conducted in Jimma in which all (100%)of the clients were satisfied with the confidentiality, appointment of the ART unit & their relationship with the provider[34]. Moreove in Addis Ababa,96.5% of the clients reported they were satisfied with the patient provider relationship . The overall satisfaction of clients on ART services in this study was 70.9%, which was consistent with a study conducted in Addis Ababa. Adult patient satisfaction with nursing care in government hospital [24] is concerned , 67% of the clients reported that they were satisfied with the services and the finding was also supported by another research by Alasad & Ahemed [36] in which overall satisfaction of clients was 77 percent. However, this finding is higher when compared with other researches, in that satisfaction rate was found to be 54.2% in Addis Ababa,22% in Gondar, and 57.1% in Jimma .

The overall satisfaction rate might be overestimated, this could be partially explained by; ART drugs supplied freely without cost, ARV drugs are the only means to prolong the life of patients, as a result, clients may not recognize factors which may dissatisfy them.

III-Adherence to ART

In this study, in which adherence was measured using self report method, 92.4% of patients were adherent with ≥ 95 % prescribed doses. This finding is similar with other findings in developed and developing countries including Ethiopia [28,31,34,39,40,41] Although our rate is similar with the above findings, it is higher than the findings in most developed countries, where rates of adherence by self report ranges from 40% to 70%[28]. Some findings which were conducted in Burkinafaso,Cote d’ivoire,Brazil,Central china, in Addis Ababa & Debriziet, in which the prevalence rate of adherence at ≥ 95 % requirement were reported 58%,74.3%,75%,80%,81.2%,and 82.8%, respectively.

Though the finding is higher, despite the numerous challenges & patients had to overcome great odds to adhere to treatment, data from studies in other African settings support our findings. These data from other African settings suggest that patients of low socioeconomic

status are able to achieve excellent rates of adherence with access to routine medical care, subsidized ARV therapy & free laboratory monitoring. The possible explanation for the higher adherence prevalence rate could be; local and international organizations and the MOH are working in collaboration by designing different strategies to decrease the overall impact of HIV/AIDS. As a result; awareness about HIV/AIDS, ART, avoiding stigma and discrimination for PLWHA by family and others are raised in the community as it is witnessed by the health providers on in depth interviewee. Further, since the study only includes clients who were on treatment for three months and above, the non adherence rate for those who missed there drugs at initial phase may be missed, and the drug compliance is a challenge at the initial period of ARV treatment as witnessed by participants. The non adherence rate of clients based on $\geq 95\%$ and 100% adherence requirement revealed that 7.6% & 37.4% of clients did not adhere or missed taking their doses at least once. The reasons patients cited for missing ARV doses in this study were almost similar to what is found by other researchers, even though the percentages are a little bit lower in this study [33, 39, 31, 28].

CONCLUSION AND RECOMMENDATION

The result of this study showed that Quality of ART service in Felige Hiwot Hospital is satisfactory. The structure and process requirement of the ART service almost fullfills the minimum requirements for implementation of ART in Ethiopia except some limitations, including in- adequacy of training, shortage of staff, lack of CD4 machine & some laboratory equipments & supplies. Regarding client satisfaction, overall client satisfaction & patient –provider relationship satisfaction rate were high. Although measured by self report method, adherence to ARV treatment was high. Based on the finding, the following recommendations are forwarded:-

- Pre service education/training should be given for graduating class health professionals by their respective Institutions.
- In service training in comprehensive HIV care should be given by Regional Health Bureau periodically for service providers with special emphasis on adherence.
- The Hospital Administration should equip CD4 count machine and other laboratory equipment since their absence they could limit achievement of the goal of the service.
- Since Holy water was the main reason for skipping doses in this study, working with religious and community leaders should be strengthened.
- Since shortage of drug supply is one of the reasons for client dissatisfaction as it was witnessed by health providers, the hospital should plan to address these problems.

- The Hospital should create access for updated guidelines, and should give refreshment courses.

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