Socio-Economic Factors that Influence Adherence to ARVS Among HIV Infected Pregnant Mothers in Health Facilities in Mbarara City, Western Uganda

*Keshara Beatrice, **Mathias Tumwebaze ***Waswa Bright Laban

*(Faculty of Nursing and Health Sciences, Bishop Stuart University, Uganda)
Email: kesharabetty@gmail.com
**(Faculty of Nursing and Health Sciences, Bishop Stuart University, Uganda)
Email: mathiastumwebaze@gmail.com
***(Faculty of Nursing and Health Sciences, Bishop Stuart University, Uganda)
Email: wlabright@gmail.com

--***********************----------------------------------

Abstract:

Globally, poor adherence to ART is a challenge among pregnant women living with HIV/AIDS. This study assessed the factors affecting adherence to ARVs among HIV pregnant mothers in health facilities in Mbarara City. This study was a cross-sectional study design. The study population included HIV-positive pregnant mothers on ART attending the HIV clinics in public health facilities in Mbarara City. Quantitative data were coded, entered, and cleaned. They were then exported to STATA Version 13 for analysis. The study findings found participants who received financial support were 1.8 times more likely to adhere to antiretrovirals than those who never received any support. Participants who noted farming as source of income for the family were 1.5 times more likely to adhere to ART than those who had businesses as source of income for the family; participants who had household income of 100,000-300,000 per month were 1.65 times more likely to adhere to ART than those who had above 800,000/= household income. It was concluded the significance of disclosure, social support, financial assistance, knowledge, income source, treatment duration, and personal willingness in promoting adherence to ART among individuals living with HIV. Implementing strategies that address these factors could help improve treatment adherence and ultimately enhance the health outcomes of people living with HIV. It was concluded that, the ministry of health should promote and facilitate initiatives that encourage disclosure of HIV status, as it plays a significant role in adherence to ART. The government should implement educational campaigns to improve knowledge about HIV, ART, and its benefits to enhance treatment adherence.

Key Words: Socio-Economic Factors, Influence, Adherence, ARVS, HIV, Infected Pregnant Mothers, Health Facilities.

INTRODUCTION

Globally, an estimated 1,400,000 HIV infected women give birth with almost 330, 000 babies becoming infected with HIV annually (World Health Organization, 2016). About 91% of these reside in sub-Saharan Africa. The transition from giving a single dose of zidovudine to mothers during

pregnancy and labor to a currently more effective lifelong triple combination of antiretroviral drugs (option-B plus) has registered tremendous success in Prevention of Mother to Child Transmission (PMTCT) rates. In sub-Saharan Africa, with improved Adherence of ARVS in HIV pregnant mothers strategies, the number of newly infected infants decreased by 58% (Gourlay et al, 2013); however, despite the wide scale-up, coverage and benefits associated with Adherence of ARVS in HIV pregnant mothers, retention of mothers in care is still a challenge. Drug side effects, partner support, the desire to prevent transmission and improve health were cited as influencers of mothers' retention in HIV care.

In Uganda, about 5.5% of pregnant mothers were HIV positive, of which 85% accessed ARVs as part of Antenatal Care (ANC) services (Hensen & Hargreaves, 2012). Health service providers' attitudes, stigma, discrimination, low ARV stock levels and lack of means of transportation of clients to nearby health facility are some of the factors that hinder retention in HIV care. In Mbarara Municipality, Adherence of ARVS in HIV pregnant mothers has been as low as 53% and ART services (Mbarara Municipal Health Officer's Report, 2019).

In the past, several solutions have been implemented to promote adherence to antiretrovirals among HIV-infected pregnant women. These include counseling and education programs, peer support groups, reminder systems (such as text message reminders), and the integration of antenatal care and ART services.

This study would provide insights into the specific factors that affect adherence to antiretrovirals among pregnant women in Mbarara City. By identifying these factors, healthcare providers and policymakers would develop targeted interventions to improve adherence rates and subsequently reduce mother-to-child transmission of HIV.

Linking this research study to national development priorities, it aligns with Uganda's health sector development plan, which includes reducing the burden of HIV/AIDS and improving maternal and child health. Additionally, the research study directly contributes to the Sustainable Development Goal (SDG) 3: Good Health and Well-being, which aims to end the epidemics of AIDS and other communicable diseases and ensure healthy lives and well-being for all, including maternal and child health. Therefore this study assessed factors that affect adherence to antiretroviral therapy among HIV positive pregnant women in Mbarara City.

PURPOSE OF THE STUDY

To identify the socio-economic factors that influence adherence to ARVs among HIV infected pregnant mothers.

METHODOLOGY

This study was a cross-sectional study design. In order to draw valid conclusions, both qualitative and quantitative data collection methods were used. The study was conducted in Mbarara City, which is located in western Uganda about 290km southwest of Kampala, Uganda's capital city.The study population included HIV-positive pregnant mothers on ART attending the HIV clinics in public health facilities in Mbarara City. These included hospitals, health centre IVs, and health centre IIIs. Inclusion criteria: HIV-positive pregnant mothers on ART who had attended the ART Clinic for the last six months. HIV-positive pregnant mothers on ART who fully consented to the study.Exclusion Criteria: Pregnant mothers who were not willing to consent because this study was voluntary. A sample size of 240 respondents participated in the study. Selection of participants was done using simple random sampling using the systematic method at each health facility. Approximately more than 25 mothers attended the antenatal clinic. Therefore, under systematic sampling, the researcher visited the hospital and

picked every first 25 mothers on each clinic visit four times (making 100 participants). Under HC IVs, the researcher picked every first 20 mothers on each clinic visit for four times (making 80 participants). A researcher-administered questionnaire consisting of both structured and semi-structured questions was used to collect data.Quantitative data were coded, entered, and cleaned. They were then exported to STATA Version 13 for analysis. Data analysis was performed at three levels: univariate, bivariate, and multivariate. Descriptive statistics (percentages, means, standard deviations, and t-statistics) and inferential statistics (logistic analysis) were generated. Data analysis was done as per the objectives.Qualitative data were analyzed using thematic content analysis. This involved cleaning up the data and categorizing them into themes and patterns. A content analysis was conducted to determine the adequacy of information credibility, usefulness, and consistency.

RESULTS

Table 1: Bivariate and Multivariate analysis for social factors affecting adherence to antiretrovirals among human immunodeficiency virus infected pregnant mother

Socio factors	category	UOR(95%CI)	p-value	AOR(95%CI)	P-value
Person currently supporting to take treatment	Husband	1.78 (1.20-2.64)	**0.006***	1.42 (0.94-2.15)	0.098
	Relative	1.24 (0.90-1.71)	0.176	1.15 (0.82-1.61)	0.381
Ever disclosed HIV status to anyone	Yes	2.15 (1.56-2.96)	**0.001***	1.92 (1.38-2.67)	**0.003****
	No	1.00		1.00	
The relationship with the person/s disclosed to	Friend	1.62 (1.10-2.38)	**0.014***	1.38 (0.92-2.07)	0.122
	Spiritual leader	0.95 (0.68-1.33)	0.763	0.88 (0.60-1.30)	0.523
	Relative	1.12 (0.82-1.53)	0.489	1.08 (0.78-1.50)	0.650
Support received after disclosure	Treatment support	1.85 (1.30-2.63)	**0.001***	1.65 (1.14-2.38)	**0.008****
	Psychological emotional	1.35 (0.97-1.88)	0.077	1.28 (0.91-1.79)	0.149
	Financial	2.03 (1.45-2.85)	**0.001***	1.84(1.29-2.63)	**0.001****
	Spiritual	1.17 (0.87-1.57)	0.311	1.12 (0.82-1.52)	0.491
	None	1.00		1.00	
The overall support received from the people you disclosed to	Excellent	1.95 (1.37-2.78)	**0.001***	1.75 (1.21-2.52)	**0.003****
	Good	1.54 (1.11-2.14)	**0.010***	1.43 (1.02-2.01)	**0.038****
	Average	1.23 (0.89-1.69)	0.209	1.18 (0.85-1.64)	0.321
	Poor	1.00		1.0	
Hindrances to adhere to ART	Stigma	2.36 (1.67-3.34)	**0.001***	2.05 (1.43-2.93)	**0.001****
	Time schedule	1.78 (1.28-2.48)	**0.001***	1.62 (1.14-2.30)	**0.007****
	Special diet	1.00		1.00	

At a multivariate level, all factors that had a P-value less than 0.05 in the bivariate analysis were included in the model. From this analysis, the results revealed

*Statistically significant (p<0.05) at bivariate and **statistically significant (p<0.05) multivariate analysis

At bivariate level, logistic regression was used to determine the single individual factors associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers. The analysis revealed that a husband currently supporting to take treatment (UOR=1.78, 95% CI = 1.20-2.64, P= 0.006); ever disclosed HIV status to anyone (UOR=2.15, 95% CI = 1.56-2.96, P= 0.001); disclosing HIV status to a friend (UOR=1.62, 95% CI =1.10-2.38, P= 0.014); received treatment support after disclosure (UOR=1.85, 95% CI =1.30-2.63, P= 0.001); received financial support after disclosure (UOR=2.03, 95% CI =1.45-2.85, P= 0.001); overall excellent support received from the people disclosed to (UOR=1.95, 95% CI =1.37-2.78, P= 0.001); overall good support received from the people disclosed to (UOR=1.54, 95% CI =1.11-2.14.78, P= 0.01); stigma as hindrance to adherence to ART (UOR=2.36, 95% CI =1.67-3.34, P= 0.001); and time schedule as a hindrance to adhere to ART (UOR=1.78, 95% CI =1.28-2.48), P= 0.001) were associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers. Other factors were not significantly associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers (as demonstrated in table 4.3).

that participants who had ever disclosed HIV status to anyone were 1.9 times more likely to adhere to antiretrovirals than those who had never (AOR=1.92,

95% CI =1.38-2.67, P= 0.003); treatment support received after disclosure were 1.7 times more likely to adhere to antiretrovirals than those who never received any support (AOR=1.65, 95% CI =1.14-2.38, P= 0.008); participants who received financial support were 1.8 times more likely to adhere to antiretrovirals than those who never received any support (AOR=1.84, 95% CI =1.29-2.63, P= 0.001); participants who received excellent overall support from the people disclosure were 1.8 times more likely to adhere to antiretrovirals than those who received poor support (AOR=1.75, 95% CI =1.21-2.52, P= 0.003); participants who received good support from people they disclosed to were 1.4 times more likely to adhere to antiretrovirals than those who received poor support (AOR=1.43, 95% CI =1.02-2.01, P= 0.038). Participants who noted stigma as a hindrance to ART were 2 times more likely to adhere to ART than those who were hindered by special diet (AOR=2.05, 95% CI =1.43-2.93, P= 0.001); participants who were hindered by time schedule to adhere to ART were 1.6 times more likely to adhere to ART that those hindered by special diet (AOR=1.62, 95% CI =1.14-2.30, P= 0.007).

The study findings from qualitative data further revealed other factors that hinder adherence to ART as mentioned by respondents, these include;

> "Fear of being stigmatized or discriminated against due to their HIV-positive status can lead to non-adherence to ART. The fear of disclosure and negative social consequences can discourage pregnant mothers from consistently taking their medication. Limited understanding of the benefits of ART, its importance for preventing mother-to-child transmission of HIV, and the potential risks of non-adherence can hinder adherence. Inadequate knowledge about the correct dosage, timing, and side effects of the medication can also contribute to non-adherence. The number of pills required for ART regimens and the potential side effects, such as nausea, fatigue, and gastrointestinal issues, can make it challenging for pregnant mothers to adhere to the medication. These physical discomforts can discourage consistent adherence".

Table 2: Bivariate and Multivariate analysis for economic factors and adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers

Economic factors	Responses	UOR(95%CI)	p-value	AOR(95%CI)	P-value
Source of income for the family	Salary only	1.24 (0.95-1.62)	0.103	1.18 (0.89-1.57)	0.267
	Farming	1.52 (1.10-2.10)	0.012*	1.45 (1.03-2.04)	0.033**
	Business	1.00		1.00	
Household income per month	10,000 - 100,000=	1.15 (0.92-1.43)	0.231	1.10 (0.87-1.39)	0.432
	100,000- 300,000=	1.78 (1.34-2.36)	0.001*	1.65 (1.22-2.23)	0.001**
	300,000 – 500,000=	1.42 (1.09-1.84)	0.009*	1.35 (1.02-1.78)	0.035**
	500,000 – 800,000=	1.24 (0.97-1.59)	0.083	1.18 (0.91-1.52)	0.223
	Above 800,000=	1.00		1.00	
Distance of transport to nearest health facility from home	Less than 1 km	0.82 (0.62-1.09)	0.162	0.76 (0.56-1.04)	0.088
	1-2 km	1.25 (0.98-1.60)	0.073	1.18 (0.91-1.52)	0.218
	3-4 km	1.38 (1.07-1.79)	0.014*	1.32 (1.01-1.74)	0.041**
	More than 5 km	1.00		1.00	
Whether there are financial reasons that hinders from adhering to ART	Yes	2.10 (1.67-2.65)	0.001*	1.98 (1.54-2.53)	0.001**
	No	1.00		1.00	

*Statistically significant (p<0.05) at bivariate and **statistically significant (p<0.05) multivariate analysis

At bivariate level, logistic regression was used to determine the single individual factors associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers. The analysis revealed that faming as source of income for the family (UOR=1.52, 95% CI = 1.10-2.10, P= 0.0012); house hold income of 100,000-300,000/= (UOR=1.78, 95% CI = 1.34-2.36, P= 0.001); household income of 300,000-500,000 /= (UOR=1.42, 95% CI = 1.09-1.84, P= 0.009); a distance of 3-4 km to the nearest health facility from home (UOR=1.38, 95% CI = 1.07-1.79, P= 0.014); and financial reasons as hindrance to adhering to ART (UOR=2.10, 95% CI = 1.67-2.65, P= 0.001) were associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers. Other factors were not significantly associated with adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers (as demonstrated in table 4.5).

At a multivariate level, all factors that had a P-value less than 0.05 in the bivariate analysis were included in the model. From this analysis, the results revealed that participants who noted farming as source of income for the family were 1.5 times more likely to adhere to ART than those who had businesses as source of income for the family (AOR=1.45, 95% CI =1.03-2.04, P= 0.033); participants who had household income of 100,000-300,000 per month were 1.65 times more likely to adhere to ART than those who had above 800,000/= household income (AOR=1.45, 95% CI =1.03-2.04, P= 0.033); participants who had household income of 300,000-500,000/= per month were 1.35 times more likely to adhere to ART than those who had above 800,000/= household income (AOR=1.35, 95% CI =1.02-1.78, P= 0.035); participants who travelled 3-5 km to nearest health facility from home were 1.3 times more likely to adhere to ART than those who noted more than 5km (AOR=1.32, 95% CI =1.01-1.74, P= 0.041); participants who said that they are hindered by financial reasons from adhering to ART were 2 times more likely to adhere to ART than those said other hindrances apart from financial reasons (AOR=1.98, 95% CI =1.54-2.53, P= 0.001) (Table 4.5).

In addition from qualitative data, financial reasons that hinders respondents from adhering to ART were revealed was presented below;

> "The high cost of antiretroviral drugs can pose a significant financial burden on pregnant mothers, especially in low-income or resource-constrained settings. The expenses associated with acquiring the medication regularly can be unaffordable for some individuals, leading to non-adherence. Apart from the cost of medication, pregnant mothers may incur additional

expenses related to healthcare services, including doctor visits, laboratory tests, and prenatal care. These costs can accumulate and create financial challenges, making it difficult to prioritize ART adherence. Traveling to healthcare facilities for medication refills or regular check-ups can involve transportation costs. For pregnant mothers with limited financial resources, these expenses can be prohibitive and result in missed appointments or delayed medication refills".

were hindered by time schedule to adhere to ART were 1.6 times more likely to adhere to ART that those hindered by special diet. The above study findings are in line with Mumbwa, Zambia, Nthala (2015) who noted that distances to ART centres were a challenge and this led to many pregnant mothers failing to adhere to ART. The cost of transport and walking long distance to the clinic was consistently noted as barriers to adherence. Additionally according to Di Giorgio *et al,* (2016), health workers are overworked, leading to longer waiting times and deteriorated patient interaction. Long waiting times have been cited as a major challenge to adherence to visits in a Botswana study, where most of the respondents reported that they spent four hours or more at the clinic.

DISCUSSION

Social factors affecting adherence to antiretrovirals among human immunodeficiency virus infected pregnant

The study findings found out that participants who had ever disclosed HIV status to anyone were 1.9 times more likely to adhere to antiretrovirals than those who had never; participants who received treatment support after disclosure to any one were 1.7 times more likely to adhere to antiretrovirals than those who never received any support; participants who received financial support were 1.8 times more likely to adhere to antiretrovirals than those who never received any support; participants who received excellent overall support from the people disclosure were 1.8 times more likely to adhere to antiretrovirals than those who received poor support; participants who received good support from people they disclosed to were 1.4 times more likely to adhere to antiretrovirals than those who received poor support. Participants who noted stigma as a hindrance to ART were 2 times more likely to adhere to ART than those who were hindered by special diet; participants who

Economic factors affecting adherence to antiretrovirals among human immunodeficiency virus infected pregnant mothers

The study findings revealed that participants who noted farming as source of income for the family were 1.5 times more likely to adhere to ART than those who had businesses as source of income for the family; participants who had household income of 100,000-300,000 per month were 1.65 times more likely to adhere to ART than those who had above 800,000/= household income; participants who had household income of 300,000-500,000/= per month were 1.35 times more likely to adhere to ART than those who had above 800,000/= household income; participants who travelled 3-5 km to nearest health facility from home were 1.3 times more likely to adhere to ART than those who noted more than 5km; participants who said that they are hindered by financial reasons from adhering to ART were 2 times more likely to adhere to ART than those said other hindrances apart from financial reasons. The above study findings are in agreement with Bermudez *et al,*

(2016) who found that familial wealth resources do have a significant and positive impact on medication adherence among Ugandan youth living with HIV. Poverty as a factor makes availability of ART services even more difficult. Pregnant mothers need money to pay for transportation to the health facilities, buy drugs when there is shortage, and also buy food necessary to maintain a well-balanced meal.

CONCLUSION

The study identified various factors influencing adherence to ART. Participants who perceived stigma as a hindrance to ART were more likely to adhere compared to those hindered by special dietary requirements or time schedules. Additionally, participants who derived their family income from farming were more likely to adhere to ART compared to those with business income. Household income also played a role, with participants earning between 100,000 and 300,000 per month demonstrating higher adherence rates.

RECOMMENDATIONS

Ministry of health should promote and facilitate initiatives that encourage disclosure of HIV status, as it plays a significant role in adherence to ART.

Ministry of health develop programs to provide social support to individuals living with HIV, such as support groups and counseling services.

The government should implement educational campaigns to improve knowledge about HIV, ART, and its benefits to enhance treatment adherence.

The policy makers should establish and enforce laws and policies that promote non-discrimination and reduce HIV-related stigma in society.

REFERENCES

Bermudez et al, (2016) Current scenario of HIV/AIDS, treatment options, and major challenges with compliance to antiretroviral therapy. *Cureus*, *8*(3).

Gourlay et al, (2013), Barriers and facilitating factors to the uptake of antiretroviral drugs for prevention of mother to child transmission of HIV in sub Saharan Africa: a systematic review. *Journal of the International AIDS Society*, *16*(1), 18588.

Hensen, B., & Hargreaves, J. (2012). Universal voluntary HIV testing in antenatal care settings: a review of the contribution of provider initiated testing & counselling. *Tropical Medicine & International Health*, *17*(1), 59-70.

Mbarara Municipal Health Officer's Report, 2019 on socio-economic factors that influence adherence to ARVS among HIV infected pregnant mothers in health facilities in Mbarara City, Western Uganda

Mbonye, M., & Jaffar, S. (2013). Adherence to antiretroviral therapy in Jinja, Uganda: a six-year follow-up study. *PLoS One*, *8*(10).

Mumbwa, Zambia, Nthala (2015), Community-based interventions to improve and sustain

.

antiretroviral therapy adherence, retention in HIV care and clinical outcomes in low-and middle-income countries for achieving the UNAIDS 90-90-90 targets. *Current HIV/AIDS Reports*, *13*(5), 241255.

Uganda Bureau of Statistics (2018) The status of the IHI/AIDS Epidemic in Uganda.

World Health Organization. (2016). *Global tuberculosis report 2013*. World Health Organization