

Research Article

Substance Abuse and Its Association with Adherence to ART Drugs Among HIV-positive Pregnant Women at Selected Hospitals of East Ethiopia

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Abstract

Background: Substance abuse among Human Immune Deficiency Virus-positive patients causes depression, carelessness, and anxiety, which in common results in a decrease in adherence to antiretroviral treatment. The purpose of the study is to assess the prevalence of substance abuse and its association with adherence to ART drugs.

Methods: The current study was conducted at three hospitals (Hiwot Fana Comprehensive University Hospital, Dillchora Hospital, and Jugal Hospital) located in East Ethiopia. Bivariate and multivariate logistic regression analysis was used to identify the association of independent variables with the dependent variables.

Results: In this study, 119 HIV-positive pregnant patients were included. While 74.8% of the patients were adherent to their medication, the remaining 25.2% were nonadherent. The major reasons for nonadherence to ART medications prescribed were getting better (73.3%) and finishing medication (16.7%). Moreover, 96 (80.7%) respondents abused alcohol while 36 (30.3%) and 75 (35.6%) abused opioids and cigarette smoking, respectively. Mothers who abused alcohol were 38.1 times more likely to be nonadherent to ART medications for PMTCT [AOR = 38.1% CI: 21.47–56.54] compared to their counterparts. Additionally, mothers who abuse opioids were 19 times more likely to be nonadherent to ART treatment medication [AOR = 19, 95% CI: 2.46–19.46] than their counterparts. Furthermore, mothers who smoked cigarettes were 43.1 more likely to be nonadherent [AOR = 43.19, 95% CI: 8.42–187.84] than nonsmokers. Unemployment was also found to be associated with nonadherence to ART medication to PMTCT of HIV [AOR = 5.4, 95% CI: 2.8–5.7]. Smoking of marijuana/cannabis/hashish was not significantly associated with nonadherence to ART [AOR = 0.22, 95% CI: 0.084–0.355].

Conclusion: Abuse of alcohol, cigarette smoking, abuse of opioids, and joblessness were found to be significantly associated with nonadherence to ART medications prescribed to PMCT of HIV. Whereas, smoking of marijuana/cannabis/hashish was not significantly associated with nonadherence to ART medications.

Keywords: antiretroviral treatment, mother-to-child transmission, substances, substance abuse

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1. Introduction

Human Immune deficiency virus (HIV) is an acquired immunodeficiency syndrome (AIDS), which is a major challenge to the healthcare system in most countries of the world today [1]. It infects CD4-positive cells which results in immunity reduction [2]. In sub-Saharan Africa, an estimated 60% of people living with HIV are women, mostly in the reproductive age group. Each year, approximately 1.4 million women living with HIV become pregnant [3]. With appropriate treatment with ART drugs, delivering by caesarian section during delivery, and exclusive breast feeding, the probability of transmission of the virus to children can be reduced to zero [3].

Good adherence (>95%) decreases the emergence of drug-resistant viral strains, AIDS-related morbidity and mortality, and mother-to-child transmission of HIV [4, 5]. High level of adherence to ART medication is required to reduce the virus to an undetectable level, which thereby enables prevention of mother-to-child transmission of HIV [6, 7].

Alcohol, cannabis, and/or marijuana are commonly abused substances, particularly among the adult population and contain tetrahydrocannabinol (THC), which impairs or alters mind [8, 9]. Abuse of substances, especially that of alcohol and opioids, is currently a tremendously increasing public health problem [10].

Substance abuse among HIV-positive patients causes depression, carelessness, and anxiety, which in common results in a decrease in adherence to ART medications [11]. Suboptimal adherence to ART medication causes an increase in blood virus and a decrease in CD4 cell counts, which results in increased transmission of HIV from mother to children [12, 13].

Chronic severe pain is a common disease among HIV-positive women which necessitates a prescription of opioid drugs for the management of pain which on subsequent use results in addiction to drugs [14]. In the USA in 2020, an estimated 2.7 million people were addicted to opioids [15]. Substance use among HIV-positive patients decreases adherence to ART mainly due to hangover caused by the use of substances [16, 17].

A systematic reviews done in the USA on between 2003 and 2014 showed that substance use was significantly associated with a decrease in adherence to ART medication among HIV-positive pregnant women. The study revealed that almost all addictive substances had significantly decreased adherence to ART medication among pregnant women [18].

HIV-infected person frequently uses substances despite frequent health education to avoid the use of substances in such a disease scenario [19]. Substance use among HIV-positive pregnant mothers decreases HIV testing-seeking behavior, initiation of ART,

and adherence to it, and hence increases the probability of mother-to-child transmission of HIV. Nonadherence to ART drugs among HIV-positive mothers increases the chance of transmission of HIV to children. Transmission of HIV from mother to child remains the major sources of HIV infection among children [19]. However, only few studies have been performed to assess the prevalence of substance abuse and its association with adherence to ART drugs in developing countries like Ethiopia. Therefore, this study aimed to fill the gap by assessing the prevalence of substance abuse and its association with adherence to ART drugs among HIV-positive pregnant women at selected hospitals in Eastern Ethiopia from June 05 to September 23, 2021.

2. Materials and Methods

2.1. Study area and study period

The current study was conducted at three hospitals (Hiwot Fana Comprehensive University Hospital [HFCUH], Dilchora Hospital, and Jugal Hospitals) located in Harar town and Dire Dawa city administrations. Dire Dawa city and Harar town are located 514 km and 526 km, respectively, east of the capital of Ethiopia, Addis Ababa. The hospitals have five major clinical departments including internal medicine, surgery, pediatric, gynecology/obstetrics, and HIV care and treatment clinics. The study was conducted between June 05 and September 23, 2021.

2.2. Study design

Hospital-based prospective cross-sectional was conducted in HIV-positive pregnant women visiting the HFCUH, Dilchora and Jugal hospitals.

2.3. Study population

The source populations for the study were all pregnant HIV-positive patients who were attending their ART at Hiwot Fana Comprehensive University hospital (HFCUH), Dilchora, and Jugal hospitals.

2.4. Measurements

Alcohol abuse was assessed using the WHO Alcohol Use Disorders Identification screening tool that contains 10 questions. A score of >8 classified as abusive alcohol drinking [32]. Opioid abuse was measured using Prescription Opioid Misuse Index (POMI) that contains a series of 6 Yes/No questions. An affirmative answer to the >1 question indicated that the patient exhibits prescription opioid misuse. Abusive cigarette smoking was measured using the National Institute on Drug Abuse Modified Alcohol, Smoking, and Substance Involvement Screening Test (NMASSIST) that contains 10 questions [33]. Adherence to medication was measured using medication adherence response scale of 5 (MARS-5). Using the MARS-5, a score of ≥ 20 was used as a cutoff for adherence [34].

2.5. Data analysis and interpretation

Data were analyzed using the SPSS version 26. Bivariate and multivariate logistic regression analysis was used to identify the association of independent variables with the dependent variables (i.e., adherence to ART). The variable with a P -value ≤ 0.25 in the bivariate analysis was further analyzed in a multivariate logistic regression model. The finding is presented using the adjusted odds ratio (AOR) with a 95% confidence interval (CI). A P -value < 0.05 was considered statistically significant.

2.6. Operational definitions

2.6.1. Adherence to medication

The extent to which patients take medication as prescribed by their physician.

2.6.2. MTCT of HIV infection

Transmission of HIV from an HIV-infected mother to her child during pregnancy, labor, delivery, or breastfeeding.

2.6.3. PMTCT of HIV infection

It is a politically and scientifically accepted approach to reduce the impact of HIV and reduce the transmission from mother to children.

2.6.4. Substance abuse

A pattern of using a substance (drug) that causes significant problems or distress.

2.6.5. Substances

Any nonmedical drugs used by study subjects such as alcohol, tobacco, cannabis, heroin, cocaine, and marijuana to alter their mood or behavior.

3. Results

3.0.1. Socio-demographic characteristics

In the current study, 119 HIV-positive patients were enrolled. Of them, 62 (52.1 %) were in the age group of 18–24 years, while 41 (34.5 %) were in the age group of 25–34 years. The majority of the participants (54 [44.5%]) were Orthodox Christians. Moreover, 41 (34.4%) respondents were illiterate, while 32 (26.9%) had completed primary education.

Furthermore, 40 (33.5%) respondents were single, while 63 (53 %) were married.

Regarding the occupations of the participants, 52 (43.7%) of them were unemployed while 24 (20.2%) were government employees. Moreover, 56 (47.1%) patients had a monthly income of <1000 EtBr (<20USD) while 41 (34.5%) had a monthly income that ranged from 1000 to 2000 EtBr (20–40USD; Table 1).

3.0.2. Medical condition of the patients

Among the study participants, 13 (11%) had confirmed diagnosis of HIV for <1 year, 42 (35.3%) for 2–5 years, and 61 (51.3%) >5–10 years.

With respect to clinical condition, the majority, 101 (84.9%), of study participants belonged to the WHO clinical stage I. Lymphadenopathy is the major symptom noticed on 70.6% patients following oral ulcer found in 12.6% of the patients (Table 2).

3.0.3. Treatment of HIV/AIDS and adherence status

All 119 patients were on drug therapy – 107 (90%), 12 (10%), and 91 (51.7%) patients were on Zidovudine + Lamivudine + Nevirapine (AZT + 3TC + NVP) for the treatment of the

TABLE 1: Socio-demographic characteristics of HIV-positive pregnant women in East Ethiopia, June 05–September 23, 2021.

Variable	Category	Frequency	Percentage (%)
Age (yr)	18–24	62	52.1
	25–34	41	34.5
	35–44	16	13.4
	Total	119	100.0
Religion	Orthodox	53	44.5
	Muslim	42	35.3
	Protestant	20	16.8
	Catholic	4	3.4
	Total	119	100.0
Educational status	Illiterate	41	34.4
	Primary education	32	26.9
	Secondary education	29	24.4
	College/University	17	14.3
	Total	119	100.0
Marital status	Single	40	33.5
	Married	63	53
	Divorced	7	5.9
	Widowed	9	7.6
	Total	119	100.0
Occupation	Government employee	24	20.2
	Self employed	13	11
	Daily labor	24	20.1
	Merchant	6	5
	Jobless	52	43.7
	Total	119	100.0
Monthly income in Ethiopian Birr	<1000 EtBr (<20USD*)	56	47.1
	1000–2000 EtBr (20–40USD)	41	34.5
	2000–5000 EtBr (40–100USD)	10	8.4
	>5000 EtBr (>100USD)	12	11
	Total	119	100.0
Number of pregnancy	1	44	37
	2	56	47
	3	4	3.4
	>3	15	12.6
	Total	119	100

USD*: United States Dollar

disease, while the remaining 12 (10%) were on Zidovudine + Lamivudine + Efavirenz (AZT + 3TC + EFV).

TABLE 2: Medical condition of HIV-positive pregnant women in East Ethiopia, June 05–September 23, 2021.

Medical condition	Category	Frequency	Percentage (%)
Duration of confirmed diagnosis with HIV/AIDS* (yr)	<1	13	11
	2–5	42	35.3
	5–10	61	51.3
	>10	3	2.4
WHO* stage	WHO clinical stage I	101	84.9
	WHO clinical stage II	18	15.1
Sign & symptoms noticed on the patient	Lymphadenopathy	84	70.6
	Oral ulcer	15	12.6
	Nail infection	17	14.3
	Pharyngitis	3	2.5

HIV: human immune deficiency virus; WHO: World Health Organization

Regarding medication adherence, 74.8% of the patients were adherent to their medication, while the remaining 25.2% were nonadherent.

The major reasons for nonadherence to medications prescribed among nonadherent patients were getting better (73.3%) and finishing medication (16.7%; Table 3).

TABLE 3: Treatment of HIV among pregnant women and adherence toward the ART medications in East Ethiopia, June 05–September 23, 2021.

Variable	Characteristics	Frequency	Percentage (%)
ART drugs prescribed	AZT + 3TC + NVP	107	90
	AZT + 3TC + EFV	12	10
	Total	119	100
Adherence to ART medications prescribed	Adherent	89	74.8
	Nonadherent	30	25.2
	Total	119	100
Reasons for medication nonadherence	Getting better	22	73.3
	Finish medication	5	16.7
	Forgetting	3	10
	Total	30	100

AZT: Zidovudine; 3TC: Lamivudine; NVP: Nevirapine; EFV: Efavirez

3.0.4. Prevalence of substance abuse

Of all the respondents, 96 (80.7%) were alcohol abuser, 36 (30.3%) were opioids abuser, and 75 (35.6%) were cigarettes smokers. In addition, 62(52%) smoked marijuana and/or cannabis (hashish; Table 4).

TABLE 4: Prevalence of substance abuse among HIV-positive pregnant women in East Ethiopia, June 05-September 23, 2021.

Variable	Category	Frequency	Percentage (%)
Alcohol abuse	Yes	96	80.7
	No	23	19.3
	Total	119	100
Opioids abuse	Yes	36	30.3
	No	83	60.7
	Total	119	100.0
Cigarette smokers	Yes	75	63
	No	44	37
	Total	119	100.0
Marijuana and/or cannabis (hashish) smokers	Yes	62	52
	No	57	48
	Total	119	100.0

3.0.5. Determinants of adherence to ART medications among the patients

In the bivariate logistic regression, abuse of alcohol, cigarette smoking, abuse of opioids, smoking of marijuana/cannabis/hashish, and occupation were factors with a p-value of <0.25 and hence selected for the multivariate model.

In the multivariate logistic regression, mothers that abused alcohol were 38.1 times more likely to be nonadherent to ART medications for PMTCT (AOR = 38.1% CI: 21.47–56.54) compared to their counterparts, whereas mothers who abused opioids were 19 times more likely to be nonadherent to ART treatment medication (AOR = 19, 95% CI: 2.46–19.46) than their counterparts. Furthermore, mothers who smoked cigarettes were 43.1 more likely to be nonadherent (AOR = 43.19, 95% CI: 8.42–187.84) than nonsmokers. Joblessness was found to be associated with nonadherence to ART medication to PMTCT of HIV (AOR = 5.4, 95% CI: 2.8–5.7). Smoking of marijuana/cannabis/hashish was not significantly associated with nonadherence to ART (AOR = 0.22, 95% CI: 0.084–0.355; Table 5).

TABLE 5: Predictors of knowledge of respondents about the effect of substances in East Ethiopia, June 05–September 23, 2021.

Variable	Adherence status to ART medication		Odd ratio (95% CI)		P-value
	Adherent	Nonadherent	COR	AOR	
Abuse of Alcohol					
Yes	13	20	3.66 (1.2–6.33)	38.1 (21.47–56.54)	0.033*
No	76	10	1	1	
Abuse opioids					
Yes	19	26	6.3 (1.7–7.32)	19 (2.46–19.46)	0.022*
No	70	4	1	1	
Smoke cigarette					
Yes	6	27	2.01 (1.2–3.507)	43.19 (8.42–187.84)	0.003*
No	83	3	1	1	
Marijuana/cannabis/hashish					
Yes	43	10	0.23 (0.14–0.56)	0.22 (0.084–0.355)	0.23
No	46	20		1	
Marital status					
Single	9	27	0.2 (0.43–0.725)	0.56 (0.48–0.783)	0.35
Married	60	3	1	1	
Divorced	5	2	0.54 (0.43–0.64)	1.38 (0.27–1.56)	0.42
Widowed	1	1	1	1	
Occupation					
Have job	67	24	0.23 (0.18–0.37)	5.4 (2.8–5.7)	0.037*
Jobless	52	19	1	1	

*Statistically significant; AOR: adjusted odds ratio; COR: crude odds ratio; CI: confidence interval

4. Discussion

In this study, 74.8% of the patients were adherent to their medication, which is comparable to the results of a study done in Northern Uganda (75%) [23]. The current result is lower than those reported by studies done in Dire Dawa, Ethiopia (65%) and in South Africa (89.7%) [4, 26]. The difference may be due the high prevalence of substance addiction among the respondents of the present study. Adherence to ART medication suppresses viral load to an undetectable levels and reduces mother-to-child transmission of HIV to zero [25–27].

In the current study, of the 112 patients, 96 (80.7%) were alcohol abusers. This finding is significantly higher than that found in studies done in Addis Ababa, Ethiopia (68.2%) [28] and Nairobi, Kenya (22%) [9]. This difference could be due to the difference in the setting in which the studies were done, in that the latter studies were done in community setting

unlike the current study which was done in a hospital setting. Alcohol use causes mental illnesses and depression which in turn decreases adherence to ART medications and results in increased viral load and decreased CD4 count, which consequently results in increased morbidity, mortality, and increased mother-to-child transmission of HIV. Appropriate counseling should be given to HIV-positive pregnant women on the effects of alcohol on their health and adherence to ART [18, 19].

Furthermore, 75 (35.6%) respondents of the current study were cigarette smokers. This result is significantly higher than that reported by a study done in Nairobi, Kenya (7%) [9]. Cigarette smoking causes mental depression, hopelessness, carelessness, and forgetfulness which all in common causes nonadherence to ART medications prescribed for pregnant women to prevent mother-to-child transmission of HIV [16, 18]. Major obstacles in vertical transmission of HIV from mother to child remain nonadherence to ART medications. Appropriate behavioral treatment should be given to cigarette-smoking HIV-positive mothers to withdraw patients from smoking cigarette since such act results in carelessness, forgetfulness, and depression which causes nonadherence to ART to PMCT of HIV among pregnant women [30].

Additionally, 36 (30.3%) participants were opioids abusers. This is significantly higher than that reported by a study done in the USA which reported that addiction to opioids was the main problem in HIV primary care in 11.9% of the respondents [31]. Opioids use in pregnancy is a common disorder that causes nonadherence among patients. HIV is a neurodegenerative disease and the abuse of opioids in such patients exacerbates the problem [16, 32].

In the present study, 62 (52%) of the study participants were addicted to smoking marijuana and/or cannabis (hashish). This is less than that reported in a study done in Florida, USA, in which 78.2% of HIV patients used marijuana [33]. The difference in the results could be due to the difference in the lifestyle of the respondents of the two studies, in which the use of marijuana in the latter study being done in a developed country may be more practicable for recreational purposes. The current result is higher than that reported in a Canadian study in which 23.1% of the study participants used cannabis [29]. The difference could be that in the latter study, more health education might have been given on the deleterious health impact of smoking marijuana to the society as the study was conducted in developed country unlike the current study.

Alcohol abusers were 38.1 times more likely to be nonadherent to ART medications for PMTCT (AOR = 38.1% CI: 21.47–56.54) compared to their counterparts. This result is in line with the results of a Northern Ugandan study (AOR = 3.24, 95% CI: 1.24–8.34) and

a Nepalese study (AOR = 4.6, 95% CI = 1.27–16.62), which showed alcohol consumption is significantly associated with suboptimal adherence to ART medications [23, 24].

In the present study, mothers who abuse opioids were 19 times more likely to be nonadherent to ART treatment (AOR = 19, 95% CI: 2.46–19.46) than their counterparts. This is in concordance with a study report from Canada, which revealed that opioids addiction and nonadherence to ART was significantly associated [34]. Opioids use is an emerging disorder among HIV-positive pregnant women and is significantly associated with nonadherence to ART medications. Appropriate health education and treatment with methadone should be given to HIV-positive women to withdraw such patients from opioid addiction, as such intervention increases adherence to ART in such population groups [34].

Mothers who smoke cigarettes were 43.1 more likely to be nonadherent to ART medication (AOR = 43.19, 95% CI: 8.42–187.84) than nonsmokers. Addictive substances like cigarettes cause psychiatric disorders among HIV-positive pregnant women and decreases adherence to ART medication for PMCT of HIV [19].

5. Conclusion

Significant proportions (22.8%) of the patients were nonadherent to ART medications. Abuse of alcohol, cigarette smoking, abuse of opioids, and joblessness were found to be significantly associated with nonadherence to ART medications prescribed to PMCT of HIV. Smoking of marijuana/cannabis/hashish was not significantly associated with nonadherence to ART medications (AOR = 0.22, 95% CI: 0.084–0.355).

Study limitations

In this study, only HIV-positive pregnant women were included. In addition to that, the study was done in limited sample size and hence the result may not represent the magnitude and associated factors of HIV among women in general.

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Ethical Considerations

The ethical clearance letter was obtained from College of Health and Medical Science, Haramaya University. Data were collected after informed consents were obtained from the study subjects. The confidentiality of the responses and the importance of providing the right information to the concerned bodies was secured.

Competing Interests

The authors declare no competing interests.

Availability of Data and Material

All the necessary data are included in the manuscript.

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