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Confronting Dual Challenges: Substance Abuse and HIV/AIDS

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Abstract
The multifaceted association between substance abuse and human immunodeficiency virus (HIV) infection is examined in this article, with particular attention paid to prevalence, risk behaviours, biological vulnerability, care-seeking barriers, and preventive measures. HIV continues to be a major worldwide health concern despite treatment breakthroughs, especially for young people (16–24 years old) and in areas like sub-Saharan Africa. HIV and substance abuse disorders often coexist, which presents difficulties for treatment compliance and public health campaigns. HIV transmission is made more likely by substance usage through risky sexual behaviours and unsafe practices like sharing needles. Substance misuse can also weaken immunity, which increases vulnerability to HIV infection and speeds up the course of the disease. The stigma associated with substance abuse and HIV frequently prevents people from getting treatment and following treatment plans. Utilising credible scientific databases and data released between 2018 and 2024, the relationship between HIV infection and substance abuse was reviewed, and strategies to break this bond were updated. Comprehensive prevention methods, can lower transmission rates and enhance health outcomes by incorporating harm reduction programmes, HIV testing and treatment accessibility, and mental health and drug abuse treatment. Effective intervention depends on addressing stigma and integrating communities in preventive initiatives. Through a comprehensive approach to treating substance use and HIV infection, societies can work towards better health outcomes and lower rates of HIV transmission among impacted groups.

Keywords: *HIV infection, Substance abuse, Treatment adherence, ART, Drug abuse*

Introduction
The prevalence of HIV infection is highest among those between the ages of 16 and 24, with younger people being disproportionately affected by the viru.[1] There were 39.0 million HIV-positive individuals as of the end of 2022. Due to continued new HIV infections and longer life expectancies brought about by efficient treatment, this figure has somewhat increased recently. Girls and women make up 53 percent of the HIV-positive population. Sub-Saharan Africa is home to 65% of people living with HIV (PLHIV).[2-3] Nevertheless, only 50% of new HIV infections

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occurred there, indicating that the continent has made more progress than other regions in lowering new infections. In 2022, there were 1.3 million new cases of HIV infection.[4] The United Nations Political Declaration on HIV/AIDS sets targets of fewer than 350,000 new infections by 2030; nevertheless, the speed of this decline is not fast enough to reach the targets.[5] Despite the availability of antiretroviral therapy (ART), 630,000 people died from AIDs-related causes in 2022, one of the most concerning statistics. Sub-Saharan Africa accounted for 60% of all AIDs-related deaths, with women and girls accounting for 44% of these deaths (compared with 53% for PLHIV).[6] HIV infections primarily affect young persons, the majority of whom are teenagers between the ages of 10 and 19.[7] Substance abuse disorders and HIV infection frequently coexist, posing difficult problems for both people and public health systems. Substance abuse, especially injectable drug use, can raise the risk of HIV transmission through unsafe sexual practices and sharing needles. On the other hand, drug abuse is a common coping strategy used by people living with HIV, which can have a negative impact on treatment compliance and overall health.[8] Prior research has also indicated that substance abuse is highly prevalent among young individuals living with HIV.[9] Younger people are more susceptible to the short- and long-term impacts of drug use the earlier they start. Worldwide, alcohol addiction is the leading cause of substance use disorders. Substance use is more likely when certain factors are present, including a person's financial background, parenting style, peer pressure, and a biological propensity for drug addiction.[10] Adolescent drug addiction is on the rise worldwide, with heroin, crack, cannabis, prescription pharmaceuticals, and other substances being abused frequently. Substance abuse has emerged as a significant global public health and socioeconomic concern, especially in emerging nations. Adolescence is a time when substance use usually starts, and during this period, substance-related behavioural patterns are likely to form.[11] These patterns can result in a variety of problem behaviours and health concerns that have an impact on the lives of those who engage in them. Studies on structural neuroimaging indicate that substance use may have an impact on the brain. For instance, compared to non-smokers and cocaine-users, smokers and cocaine users have shown reduced grey matter volumes.[12] Research has also shown that substance-using teens and young adults during the teenage developmental stage have poor neuropsychological performance on working memory.[13] The fact that teenagers and young people can have HIV infection further complicates this picture. Youth living with HIV who use drugs have been associated with a number of unfavourable health outcomes, such as noncompliance with ART, which can lead to a decline in health and the development of AIDs, which ultimately results in death.[1] In addition to raising the probability of hazardous sexual behaviours including unprotected sexual encounters, substance abuse in this vulnerable demographic also raises the chance of HIV-negative youngsters contracting new infections. Research has indicated that substance abuse among individuals living with HIV can impede effective advancement along the HIV care pathway, including the reduction of viral loads, the absence of opportunistic infections, enhanced quality of life and productive living, and the avoidance of AIDS development.[14]

Substance addiction and HIV infection are closely related. Therefore, this article sought to x-ray the synergy that exist between these two monsters. Reputable scientific databases were consulted and related published data were used. From this extensive search, the close knit between HIV infection and substance abuse was re-emphasized and measures to disconnect this unholy union

re-assessed. Comprehensive strategies that incorporate HIV prevention, harm reduction, and drug abuse treatment services are needed to address these obnoxious duos. Access to opioid replacement therapy, evidence-based substance use treatment, and sterilised needles can lower the risk of HIV transmission among drug users.[15] Additionally, in order to successfully support people living with HIV and substance use disorders, treatments that address mental health issues and socioeconomic determinants of health are essential. To guarantee fair access to care and support, public health initiatives must also fight stigma and prejudice against those living with HIV and those struggling with drug use disorders. Reducing HIV transmission and improving outcomes for afflicted individuals are made possible in large part by policy changes, community involvement, and education. Through a comprehensive approach to HIV and drug abuse, societies may strive towards better outcomes and healthier communities for all.

Substance use and Increased Risk Behavior

Sharing needles and other drug paraphernalia might raise the risk of HIV infection among those who use substances, especially injectable drug users. Substance abuse can also result in unsafe sexual practices including unprotected intercourse, which raises the possibility of HIV transmission even further. According to a study done in the USA, 32.9% of children (ages 12 to 26) living with HIV used tobacco, 27.5% used marijuana, 21.3% used alcohol, and 22.5% reported using any other illicit drug. The study also examined the prevalence and correlates of substance use among this population. 2.4% of HIV-positive teenagers in Uganda between the ages of 10 and 18 were found to abuse alcohol, and 2.4% were found to use inhalants, according to a study conducted there. Substance abuse among young people with HIV/AIDS raises serious public health issues because it is linked to mental health conditions including anxiety and depression and because it significantly impairs adherence to ART, which is essential for the effective prevention and treatment of HIV infection. Because they might intensify risk behaviour, substance use disorders are a serious concern in the setting of HIV infection. People who struggle with substance use disorders frequently participate in risky behaviours including injectable drug use and unprotected sexual encounters, which greatly increases their susceptibility to HIV infection. Substance abuse and HIV infection interact in a complicated and multidimensional way. Drug abuse can impair judgment and decision-making, which increases the chance of participating in dangerous behaviours like sharing needles or having unprotected sex, which increases the risk of HIV transmission. Substance abuse can also make it more difficult to follow HIV treatment plans, which can accelerate the virus's spread and lessen the impact of antiretroviral therapy. In addition, the social and environmental aspects of substance use, such as homelessness, poverty, and stigma, might increase an individual's risk of contracting HIV and passing it on to others. Comprehensive strategies that incorporate harm reduction techniques, access to evidence-based treatment for substance use disorders, and HIV preventive services are needed to address substance use disorders in the setting of HIV. These interventions ought to be customised to meet the unique needs of each person, tackling drug abuse and HIV-related issues together in a comprehensive way. Effective treatment of drug use disorders can reduce the elevated risk behaviour linked to HIV infection, eventually leading to better health outcomes for HIV-positive patients.

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Substance abuse and Biological Vulnerability

Substance abuse can impair judgement and weaken the immune system, which increases a person's susceptibility to HIV infection.[16] For instance, alcohol addiction can impair the immune system's capacity to fend off infections, while substances like cocaine and methamphetamine can boost HIV replication.[16] For a variety of reasons, substance abuse greatly increases one's biological susceptibility to HIV/AIDs. First, sharing needles and other injection supplies can directly contribute to the spread of HIV when specific chemicals, such as injectable medications, are used. The danger of infection among substance users is increased by this direct mode of transmission. Furthermore, substances such as alcohol and other narcotics can impair immune function, increasing the risk of HIV infection and hastening the disease's course once it has begun. Substance abuse can affect the health outcomes of HIV-positive people by interfering with their adherence to medicines. Drugs may facilitate HIV's entry into the brain, immunological response, and neurotoxic release, all of which may contribute to the development of chronic neuroinflammation. HIV infection can result in neurocognitive problems, often known as NeuroHIV, which are caused by inflammation in the brain.[17] Approximately 50% of people living with HIV/AIDs experience neurocognitive problems linked to HIV.[18] Since ageing, drug use, addiction, and mental problems are frequent and can cause comparable cognitive symptoms, neuroHIV is difficult to detect and treat.[19] New therapeutic strategies are still needed to address the neurological effects of HIV because clinical studies for anti-inflammatory or neuroprotective drugs have not been successful. Reducing the biological susceptibility to HIV/AIDs requires addressing substance use in addition to preventive and treatment initiatives.[20] To enhance health outcomes and lower transmission rates, interventions should concentrate on harm reduction techniques such giving drug users access to clean needles and syringes, encouraging safer sexual behaviour, and combining substance misuse treatment with HIV/AIDs care.

Drug Use Disorders as Obstacles to HIV Care

Drug use disorders may stand in the way of HIV treatment, testing, and prevention. The stigma attached to substance abuse and HIV can discourage people from getting treatment.[21] Substance abuse can also result in inconsistent healthcare-seeking patterns and noncompliance with HIV treatment plans. Heavy drinking, such as binge drinking, dangerous or hazardous alcohol consumption, or drinking at levels consistent with alcohol use disorders, has been demonstrated to impede the uptake of ART, lower CD4 cell count and ART adherence, increase viral load, and hasten the onset of HIV disease symptoms. Similarly, substance abuse hindered or delayed HIV testing, linkage to and retention in care, and ART adherence, according to a qualitative study involving individuals who use drugs both injectable and non-injectable (marijuana, heroin, cocaine, and methamphetamines).[22] According to other studies, injectable drug usage and stimulant use raises viral loads and has a detrimental impact on ART adherence and retention in therapy, possibly leading to its cessation.[23] Notably, regardless of ART adherence, substance use in general—and stimulant use in particular—may promote viral replication and result in a larger viral load. Addiction to drugs and alcohol can also speed up HIV's spread and its effects. Clinical studies show that drug addiction and use, especially in patients on ART, may aggravate AIDs-related mortality, speed up the development of the disease, and raise viral loads. Furthermore,

individuals with substance abuse disorders have a lower likelihood of consistently taking life-saving HIV treatment, which exacerbates the progression of their condition.[24] Behavioural HIV care interventions are essential to improve treatment results for individuals with HIV who use drugs or alcohol, given the significant impact that substance use has on HIV care continuum outcomes.

Prevention Strategies that mitigate substance use and HIV obnoxious synergy

Effectively battling the dual epidemics of substance use and HIV requires the implementation of prevention methods that address their synergy. These tactics include a variety of interventions designed to lessen the risky behaviours that come with substance use and to encourage substance users to take HIV preventive measures. It is essential to provide thorough information regarding the connection between substance use and HIV transmission. This includes being aware of the ways in which substance use can impede judgement and heighten the risk of engaging in unsafe behaviours like sharing needles or unprotected sex.[25] Adopting harm reduction initiatives, such as supervised consumption places and needle exchange programmes, can reduce the risk of HIV infection among drug users. These initiatives lessen the negative effects of substance use by offering sterilised supplies, information, and assistance.[26] Ensuring simple access to HIV testing and treatment services either in conjunction with or within substance abuse treatment institutions can aid in the early detection of cases and stop further transmission. Results can be enhanced by including HIV testing and counselling in settings for drug abuse treatment. Mental health illnesses frequently co-occur with HIV and substance use disorders. Reducing HIV risk behaviours may be more successful with integrated treatment approaches that simultaneously address mental health and drug abuse problems.[7] Effective prevention requires addressing the stigma attached to both drug abuse and HIV.[21] The risk of HIV transmission can rise as a result of stigma preventing people from getting tested, receiving treatment, or using support services. Adopting laws that guarantee drug users equal access to healthcare and decriminalise drug use are two examples of how to foster an atmosphere that supports prevention initiatives.[27] Involving communities, particularly those who use drugs, in the development and use of preventive measures promotes a sense of ownership and raises the chances of success.[28] In order to effectively address the particular issues faced by some populations at higher risk, interventions such as injecting drug users or men who have sex with males can be tailored to these groups. It is common for mental health illnesses and substance use disorders to coexist, which makes managing HIV infection more difficult. To get optimal health outcomes, substance use and HIV therapy must be combined with attention to underlying mental health disorders. It is feasible to lessen the negative correlation between substance abuse and HIV by combining these preventative techniques, which will ultimately lower transmission rates and enhance the health of impacted individuals and communities.

Conclusion

The intricate and entangled relationship between substance abuse and HIV infection has been clarified by this manuscript. We have examined the complex relationship between substance use and increased risk behaviours as well as biological vulnerabilities that increase HIV spread. We have also looked at treatment adherence issues and stigma that people with HIV and substance

addiction problems must deal with in order to receive therapy. There is potential for reducing transmission rates and enhancing health outcomes through comprehensive prevention efforts that incorporate harm reduction activities, access to HIV testing and treatment, and mental health and drug misuse services. But it's still critical to address the structural injustices and underlying social conditions that support drug usage and HIV stigma. Public health initiatives must thereafter maintain a comprehensive strategy that takes into account the interlocking variables at work. Together, substance addiction and HIV infection can be addressed to improve community health and lessen the impact of these two global epidemics on impacted groups.

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