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# THE RELATIONSHIP BETWEEN DRUG ADDICTION AND SIGNIFICANT INFECTIOUS DISEASES

Kaya Süer (a)*, Omid Mirzaei (b), Kadir Yelmi (c), Aslı Aykaç (d)
*Corresponding Author

(a) Near East University Faculty of Medicine, Infectious Diseases and Clinical Microbiology Department, Nicosia, Mersin10 Türkiye, kayasuer56@gmail.com
(b) Near East University Faculty of Engineering, Department of Biomedical Engineering, Nicosia, Mersin10 Türkiye
(c) Near East University Hospital, Department of Emergency Service, Nicosia, Mersin10 Türkiye
(d) Near East University, Department of Biophysics, Nicosia, Mersin 10 Türkiye

**Abstract**

Substance addiction can be explained as individuals' unrestrained desire to consume a substance although such consumption harms their mental, physical, and social lives. Addicts are exposed to stigmatization and discrimination, which limits their ability to get the help they need. In 2021, one in every 17 people between the ages of 15 and 64 was found to be using drugs, which is a 23% increase compared to 10 years ago. In addition to overdose, hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are the leading causes of deaths related to drug use. Research on drug use by gender shows that men were more likely to be addicted to drugs than women with opioids being the most used resulting in about two-thirds of drug-related deaths occur among opioid users. HCV and HIV infection are the two most important parameters for intravenous drug users. In the context of WHO's HCV and HIV elimination projects, the key points are particularly at-risk groups. For this reason, treatment options and education of the population at key points in terms of both viral infections should be planned primarily without allowing stigmatization and discrimination in terms of public health.



*Keywords:* Drug addiction, Hepatitis C, HIV, Sexually transmitted diseases

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## 1. Introduction

Substance addiction can be explained as individuals' unrestrained desire to consume a substance although such consumption harms their mental, physical, and social lives. The route of use for addicts may vary depending on the type of substance. It may take the form of an injection, nasal sniffing, inhalation, smoking, or gastrointestinal ingestion. Addicts are exposed to stigmatization and discrimination, which limits their ability to get the help they need (UNODC, 2023). In 2021, one in every 17 people between the ages of 15 and 64 was found to be using drugs, which is a 23 % increase compared to 2011 (UNODC, 2023). The evaluation of data from the last five years shows that 11.2 - 14.8 million people worldwide use intravenous drugs (Degenhardt et al., 2017; Degenhardt et al., 2023; United Nations, 2020; UNODC, 2022). Diseases secondary to drug use are responsible for a significant portion of the global disease burden (Degenhardt et al., 2013). It is estimated that 46.8 million of the 450 million sexually active people aged 15 - 49 living in the European region, including Turkey, have treatable sexually transmitted diseases (STDs) (Barta et al., 2007). The relationship between substance addiction, risky sexual behaviors, and sexually transmitted infections has been well-established (De Queiroz et al., 2017; Rajapure et al., 2012). It has been found that methamphetamine and cocaine use increase the frequency of unprotected intercourse with more than one partner, and blood-borne diseases are more common in intravenous injection drug users. Hence, substance use increases the risk of STDs due to increased risky and impulsive behaviors, impaired judgment, and the inability to process the damaging consequences of risky sexual behaviors (Akçay & Akçay, 2019). In addition to overdose, hepatitis C virus and human immunodeficiency virus are the leading causes of deaths related to drug use (Degenhardt et al., 2016; Mathers et al., 2013). However, thanks to the direct-acting antiviral drugs that have been used in the treatment of the hepatitis C virus since 2011 and the effective antiretroviral drugs used in HIV treatment, important steps have been taken in controlling these two dangerous diseases. With these steps, success rates in hepatitis C treatment have increased by 95 - 99% with three-month treatment protocols. In HIV treatment, HIV-RNA negativity is observed between 15 days and 3 months following the initiation of treatment. However, although the total case rates reported in the literature have decreased, these two diseases still play a crucial role impacting addicts' health. In addition, although hepatitis A and B are less common among addicts, they nevertheless can be detected in addicts. Among sexually transmitted diseases, syphilis, gonococcus with urethral discharge, ureaplasma, mycoplasma, trichomanas vaginalis, chlamydia infection, Herpes simplex, the human papilloma virus, as well as tuberculosis, pneumonia, and infective endocarditis are also associated with drug abuse. In addition, infections such as cellulitis, subcutaneous skin abscess, myositis, necrotizing fasciitis, and septic thrombophlebitis are frequently observed in drug-addicted individuals (Şimşek et al., 2014).

Analysis of rates of drug use by gender in the UNODC World Drug Report (2023) reveals that men were more likely to be addicted to drugs than women. Gender related usage of types of substances were reported as opiates (75%:25%), cocaine (73%:27%), cannabis (70%:30%), ecstasy-type substances (62%:38%), amphetamines (55%:45%), and non-medical use of pharmaceutical opioids (53%:47%) (UNODC, 2023). Opioids caused a higher mortality rate among addicts than any other substance. Globally, about two-thirds of drug-related deaths occur among opioid users. An increase in drug-related deaths over the years has been detected. Though dated, in 2019, it was estimated that around 500,000 people lost their lives - 17.5% higher than in 2009. WHO estimates that approximately 242,000 people will die from hepatitis

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C in 2022, mostly from cirrhosis and hepatocellular carcinoma. Cirrhosis due to hepatitis C and hepatocellular cancer account for more than 50% of drug-related deaths (1 April 2024). The death rate due to overdose is reported to be 25% (UNODC, 2023). Practices aimed at reducing harms related to drug use are known as opioid antagonist treatment and clean injector programs. It is predicted that these methods will reduce the global health burden, but for the time being, they are being implemented effectively at a low level worldwide (Colledge-Frisby et al., 2023; Degenhardt et al., 2019; Wilson et al., 2015).

## 2. Hepatitis C

While the hepatitis C virus is most common in the Middle East and North Africa region, it continues to be an important health problem in many countries around the world (Aygen et al., 2023; Ayoub et al., 2023). The Global Burden of Disease Study states that deaths due to hepatitis are the seventh leading cause of death. Among hepatitis, hepatitis C-related deaths were found to be over 50% (Ayoub et al., 2023). Acute hepatitis C has a mild clinical course and rarely shows clinical symptoms. Therefore, the majority of patients with hepatitis C antibody positivity are defined as having chronic hepatitis C. In these cases, it is very difficult to make a diagnosis without testing (Taha et al., 2023). Although the prevalence of chronic HCV has decreased dramatically following the use of orally administered direct-acting antivirals, the global prevalence of chronic HCV is still as high as 58 million patients, according to the World Health Organization's statement dated July 18, 2023 (Taha et al., 2023). However, this figure was reported as 170-200 million in the literature before the use of direct-acting antivirals. In the majority of patients treated with direct-acting antivirals, the infection is curable and minimal side effects are observed (Pawlotsky et al., 2020; World Health Organization, 2023). In untreated patients, chronic hepatitis C shows an inflammatory process. In treated patients, suppression of this inflammatory process reduces the severity of fibrosis and the incidence of secondary complications such as cirrhosis and hepatocellular carcinoma. In patients with F3 fibrosis who were followed up after treatment with direct-acting antiviral (DAA), fibrosis regressed in 58% of cases, did not change in 30% of cases, and an increased fibrosis process was observed in 12% of cases (Shiha et al., 2022). Regression of fibrosis reduces complications such as the development of cirrhosis, HCC, and liver transplantation. Many studies have reported a decrease in the incidence of HCC in patients followed up after DAA treatment (Kanwal et al., 2017; Li et al., 2018; Zakareya et al., 2021). WHO launched the HCV eradication program in 2016 to reduce the public health impact of hepatitis C, a global infection problem. The ultimate goal of this eradication program is to reduce the number of new cases, ensure that access to testing and treatment is equally distributed in all communities, and monitor surveillance. This aims to reduce cases and deaths. The target is a 90% reduction in the incidence of hepatitis C and a 65% reduction in mortality by 2030 (Taha et al., 2023). However, even in the pre-SARS-CoV-2 period, only five countries were found to have adequately implemented this program. With the onset of the SARS-CoV-2 pandemic, the HCV elimination program slowed down and was even suspended. One country that lost progress was Italy, where there was a 35% decrease in the number of patients started on treatment in 2019 compared to 2018. In the first year of the COVID-19 period, the rate of treatment initiation for chronic HCV patients in Italy decreased by 88% compared to 2018 (Blach et al., 2021). The routes of transmission of hepatitis C can be broadly classified as contact with blood and blood products, sexual transmission, and perinatal transmission. Injection drug users are an important part of the global

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hepatitis C epidemic. WHO estimates that 23% of newly diagnosed hepatitis C cases are intravenous drug users. Global estimates by UNODC, WHO, UNAIDS, and the World Bank are that one out of every two intravenous drug users is infected with hepatitis C (UNODC, 2023). The results of a study conducted in European Union (EU) countries clearly emphasize which groups should be treated first in the fight against hepatitis C. In this study, anti-HCV positivity in the general population was found to be between 0.54% and 1.5%, depending on the country. In specific groups, it was reported to be 7.9% - 82% in intravenous drug users. Other groups were prisoners (7 - 41%), HIV-positive MSM (1.8 - 7.1%), HIV-negative MSM (0.2 - 1.8%), pregnant women (0.1 - 1.3%), first-time blood donors (0.03 - 0.09%) (Han et al., 2019). Considering this heterogeneous distribution of hepatitis C and the groups in which it is detected, it is clear what research needs to be done in order to come closer to achieving eradication.

Vaccine studies can be examined under the main headings of micro elimination strategies and macro elimination strategies (Matičič et al., 2020).

*2.1 Hepatitis C vaccine*: In addition to this eradication program initiated by the WHO in 2016, vaccine studies are also ongoing. To date, the only infectious disease that can be eradicated with a vaccine is smallpox. A vaccine that can be effective against HCV is found will make a great contribution to the eradication of the disease. The latest AdCh3NSmut1/MVANSmut vaccine, based on the viral vector-modified vaccine Ankara, was tested in a two-stage, phase 1/2 double-blind, randomized, placebo-controlled trial among people using intravenous drugs (PWID). The safety and immunity of the vaccine were found to be successful, but the results showed that chronic hepatitis C developed in the placebo and vaccine arms (Ng et al., 2007). Micro-elimination strategies are a method that aims to investigate groups with a high risk of the disease and provide treatment. Micro-elimination can be achieved with effective treatment practices in groups such as person who injected drug (PWID), Men who sex with men (MSM), thalassemia patients requiring blood transfusion, decompensated cirrhosis, organ transplant recipients, haemodialysis patients, HIV co-infection patients, and prisoners (Matičič et al., 2020). Considering that more than 50% of all newly detected hepatitis C patients in EU countries are PWID, effective DEA treatment, opioid substitution therapy, and ensuring safe injector use can be used as micro-elimination strategies to reduce transmission in this group (European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2019)

*2.2 Macro-elimination strategies*: This program aims at screening all or a large part of the country's population and detecting HCV cases. This method is not recommended by the WHO in countries where HCV prevalence is below 2% because it is not cost-effective (World Health Organization [WHO], 2017). Instead of screening the whole population, practices such as screening pregnant women and certain age groups can be used. It may be interrupted due to the high population of the country, the economic burden, and inadequacies in the organization. Such difficulties can be overcome with the contribution of the army, as in the Egyptian example (Matičič et al., 2020). A good example of macro elimination strategies is the one implemented in Georgia, where DEA treatment was applied in cases detected after screening and a 98.7% recovery rate was achieved (Averhoff et al., 2019). In Iceland, as a result of mass screening, education campaigns, the provision of sterile syringes to PWID groups, and the initiation of treatment with DEA for positive cases, it was observed that HCV positivity decreased by 80% in the PWID group within two years (Olafsson et al., 2018).

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## 3. Human Immunodeficiency Virus

With the use of effective antiretroviral drugs (ART), HIV is now considered a preventable disease. The disease can be kept under control if infected people have access to treatment and use medication correctly. Transmission from an HIV-infected person can occur when HIV-RNA is detected as positive. In patients who are started on ART, the infectiousness of the person disappears after HIV-RNA becomes negative with the effectiveness of the treatment. Transmission routes include blood and blood products, intravenous drug addiction, heterosexual and homosexual intercourse, and when the virus reaches skin and mucosal surfaces with impaired tissue integrity (Baggaley et al., 2006; Patel et al., 2014). With the practices in blood banks, donors are questioned and controlled with nucleic acid amplification tests. In Turkey, no transmission with blood or blood products has been reported in 2020, including patient groups receiving regular blood transfusions (Republic of TURKIYE Ministry of Health, General Directorate of Public Health, 2023). Sharing injectors and equipment among intravenous drug addicts is still considered an important source of transmission in this group. Although there are differences according to regions, hand was determined as the transmission route of HIV at 10% in the world for 2019 (Smith et al., 2020). In PWID groups, this rate was found to be 48% in Central Asia and Eastern Europe, 43% in North Africa and the Middle East, 17% in Western and Central Europe, and 15% in North America (Smith et al., 2020). Globally, it is estimated that 14.8 million (10.0 - 21.7) people aged 15 - 64 years use intravenous drugs. According to current findings, 2.8 million women and 12.1 million men use intravenous drugs (Degenhardt et al., 2023). The risk of HIV infection in intravenous drug users is 35 times higher than in non-intravenous drug users. The joint global estimate by UNODC, WHO, UNAIDS, and the World Bank is that the proportion of people living with HIV for intravenous drug users is approximately 12%, meaning that 1.6 million intravenous drug users (1 in 8 people) are living with HIV (UNODC, 2023). In addition to injection drugs, other substances associated with HIV risk include cocaine, amphetamines, alcohol, nitrates, and crystal methamphetamine (Smith et al., 2020). HIV transmission can be prevented by pre- and post-exposure prophylaxis (UNAIDS, 2020).

Pre-exposure prophylaxis (PrEP) refers to the treatment where an antiretroviral drug is taken to prevent HIV transmission due to sexual preferences and intravenous drug addiction in a person without HIV infection. Two combinations have been approved for this purpose: Tenefovir Disoproxil Fumarate + Emtricitabine or Tenofovir Alafenamide + Emtricitabine (EACS European AIDS Clinical Society, 2019; National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention [NCHHSTP], 2019). When an HIV-negative person is exposed to HIV through sex and IV drug use, sufficient levels of antiretroviral drugs in the blood can stop the attachment and replication of the virus. However, inadequate drug concentration in the blood can result in transmission. PrEP treatment can be applied to people who do not have HIV but will be exposed due to sex and intravenous drug use; people who know that their sexual partner is HIV positive; people who have sexual relations with multiple partners who do not use condoms; people who use intravenous substances, especially those who have HIV-infected injection partners; those who share injectors and needles while using intravenous substances; and people who have received post-exposure prophylaxis more than once and whose risky behaviors continue. PrEP's effectiveness increases if used regularly every day by individuals who continue risky behaviors. Studies have found that sexual transmission has been reduced by 99% and intravenous drug use by 74%. In addition to PrEP application,

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regular condom use and other standard methods to prevent transmission will further reduce transmission rates (Adams et al., 2019). Post-exposure prophylaxis (PEP) refers to the initiation of medication within 72 hours of a possible exposure to HIV to prevent the transmission of HIV infection. PEP should only be used in emergencies while PrEP is preferred for those at risk of frequent exposure to HIV. PEP should be administered to those who are exposed to HIV during sexual intercourse, those who use common syringes and needles to use intravenous drugs, those who are exposed to sexual assault, and in case of contact with blood and other body fluids of health personnel who intervene in HIV-infected patients, it is recommended to start PEP as soon as possible after exposure. After 72 hours, it is not expected to provide effective prophylaxis. PEP should be used regularly for 28 days after initiation (Zeren Öztürk & Günher Arıca, 2024).

According to WHO (2023), the following are the global trends: to date, 85.6 million (65 -113 million) people have been infected with HIV. Approximately 40.4 million (32.9 - 51.3 million) people have died. The number of people living with HIV will be 39 million (33.1-45.7 million) by 2024. Worldwide, 0.7% people aged 15 - 49 are living with HIV. Distribution rates vary between regions. According to the WHO, Africa is the region with the highest prevalence of HIV-positive people. One in every 25 adults (3.2%) in Africa is living with HIV, accounting for two-thirds of all HIV-positive people worldwide.

## 4. Drug use in the Northern Cyprus

According to the results of a survey conducted in the Northern Cyprus on drug use among people aged 18–65 years, the use of illegal psychoactive substances other than alcohol and tobacco was 3.0% in 2003. According to the prevalence of use, marijuana (2.9%), ecstasy (0.9%), and amphetamine (0.5%) were found to be the most common. In the 2017 repeat survey, the rate of illicit psychoactive use was 11.7%. The most commonly used synthetic cannaboides were bonsai (5.8%), cannabis (2.8%), ecstasy (2.7%), cocaine (2.5%), amphetamine (1.3%), heroin (1.2%), and lysergic acid diethylamide (LSD) (0.7%) (Öğüt, 2019).

## 5. Recommendations for the Northern Cyprus

HCV and HIV infection are the two most important parameters for intravenous drug users. In the context of WHO's HCV and HIV elimination projects, the key points are particularly at-risk groups. For this reason, treatment options and education of the population at key points in terms of both viral infections should be planned primarily without allowing stigmatization and discrimination in terms of public health.

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