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Continuing links between substance use and HIV highlight the importance of nursing roles

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Abstract

Links between HIV and substance use were identified early in the U.S. HIV epidemic. People who use drugs are at risk of HIV infection through shared injection equipment and risky sexual behaviors. In addition, substance use has negative health consequences for people living with HIV. The prescription opioid misuse epidemic, linked to injection drug use, hepatitis C infection, and HIV, poses a new threat to declining HIV rates. We reviewed evidence-based interventions that decrease HIV risk in people who use drugs (needle/syringe programs, medication-assisted treatment, engagement in HIV care, and PrEP/PEP). The critical roles of nurses in HIV prevention/care for this population are described, including applying the principles of harm reduction, screening for substance use, and undertaking implementation and research efforts. As the nation's largest health care profession, nurses are positioned to contribute to the quality of HIV-related prevention/care for people who use drugs and to lead practice initiatives.

Keywords

HIV; interventions; nursing roles; substance use

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Nurses have played significant roles in providing care to people living with HIV infection (PLWH) from the outset of the HIV epidemic, as team members and as direct care providers. The Association of Nurses in AIDS Care (ANAC), founded in 1987, has focused on education activities, professional development, certification in the specialty, and research to equip nurses for the challenges of delivering high quality care for persons affected by HIV, including people who use drugs (PWUD). These efforts, and an established journal, the *Journal of the Association of Nurses in AIDS Care (JANAC)*, founded in 1989) exemplify nurses' leadership in developing models for HIV care, preparing clinical specialists, and addressing HIV-associated stigma. The breadth of this care is evident in the ANAC mission: "to foster the professional development of nurses involved in the health care of those individuals affected by HIV, and to promote the health, welfare and rights of all HIV-infected persons" (ANAC, 2016). The mission also provides an umbrella for nurse generalist and specialist roles in community, ambulatory, and institutional settings. Working to achieve success in this mission has required addressing the multiple barriers to accessing health care faced by PWUD, many of whom come from disenfranchised minority populations. Although HIV among people who inject drugs (PWID) has shown a dramatic decline in the United States from about one third of all new cases in the 1980s to about 6% of new cases in 2014 (Centers for Disease Control and Prevention [CDC], 2015), substance use continues to shape the HIV epidemic in the United States.

HIV-Substance Use Links

The link between HIV and substance use occurred early in the U.S. HIV epidemic, when PWID were identified as being at high risk for HIV infection. Parenteral transmission of HIV by PWID was related to the sharing of syringes and other injection equipment. The crack cocaine epidemic in the 1980s fueled the HIV epidemic through high-risk sexual practices, including trading sex for crack (Edlin et al., 1994; Inciardi, 1995). Although there has been a substantial decline in crack cocaine use, non-injection drug use continues to play an important role in HIV transmission, primarily through risky sexual behaviors. In the late 1990s, non-injection drug use was linked to the rise in new infections among men who have sex with men (MSM), through an increase in "chemsex"- the use of drugs such as ecstasy, methamphetamine, cocaine, GHB, and ketamine while having sex (Halkitis et al., 2011). More recently, about one third of new HIV infections in MSM have been attributed to non-injection substance use (Kurtz, Stall, Buttram, Surratt, & Chen, 2013), and a recent study raises the concern that HIV-uninfected MSM who use stimulants may be less adherent to pre-exposure prophylaxis (PrEP), leading to increased risk of HIV infection (Oldenburg et al., 2015).

Substance Use by PLWH

Nurses caring for PLWH must continually update their knowledge about trends in substance use and evidence-based interventions to incorporate into nursing care. In a 2010 survey, as many as 25% of PLWH reported engaging in binge drinking and nearly 25% needed treatment for alcohol and/or illicit drug use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010), compared to 8% of all U.S. adults (SAMHSA, 2012).

The substances most frequently used by PLWH included cocaine, alcohol, cannabis, tobacco, and opioids (Meyer, Althoff, & Altice, 2013). Substance use has also been found to be higher among PLWH (compared to those without HIV) and in both younger and older populations; prevalence rates vary by the specific population studied (Edelman et al., 2015).

Substances used by PLWH, including alcohol and tobacco, have been shown to have severe health consequences. PLWH who are smokers, compared to non-smokers, are more likely to develop the adverse health consequences of smoking-related cancers, and cardiovascular, metabolic, and pulmonary diseases (U.S. Department of Health and Human Services [USDHHS], 2014). In addition, using smokeless tobacco (snuff, chewing tobacco), smoking hookah, and vaping with e-cigarettes results in exposure to chemicals believed to be carcinogenic as well as nicotine, placing users at risk for addiction (CDC, 2016). Alcohol consumption has been linked to lower adherence to antiretroviral therapy (ART; Beer & Skarbinski, 2014; Samet, Horton, Meli, Freedberg, & Palepu, 2004). Multiple studies have shown that drug use, including alcohol use, can impact the effectiveness of HIV-related interventions in multiple ways: Alcohol use directly impacts health (Williams et al., 2014) and substance use is associated with late entry to HIV care, especially for women (Wechsberg et al., 2015), lack of adherence to ART, and poorer treatment outcomes (Meyer et al., 2013).

On-going substance use-related threats to HIV prevention and positive treatment outcomes have demonstrated that substance use must be addressed if further declines in HIV and its comorbidities are to be achieved. Nurses are the primary and often first point of contact for PWUD in health care systems worldwide. They not only advocate for and deliver evidence-based interventions, including education, they also screen for substance use and referral to care, and engage in needed research including implementation science research. We summarize evidence-based interventions for PWUD as central to the critical roles of nurses in HIV prevention and care for PWUD.

Recent Threats to the Decline in HIV

The prescription opioid (PO) misuse epidemic has presented the most recent threat to declining HIV rates in the United States. PO misuse, defined as intentional use of POs for reasons other than those for which they were prescribed, has risen sharply in the United States, particularly among young adults (ages 18–25 years), and has been reported in many rural and suburban communities in the United States (Conrad et al., 2015; USDHHS, 2013; Young & Havens, 2012).

An estimated 4.2% of the U.S. population reported past-year misuse of prescription opioids, and 1.9 million persons reported PO dependence in the year prior to the study (SAMHSA, 2014). The number of POs prescribed has quadrupled since 1999, as have unintentional overdose deaths involving POs (CDC, 2011). PO misuse has been linked to increased incidences of injection drug use, HIV, and hepatitis C virus (HCV; due to sharing injection equipment), and increases in fatal and non-fatal drug overdoses (CDC, 2012).

In addition to the emergence and growth of PO misuse, new substances of abuse are always being invented. For example, synthetic cannabinoids and synthetic cathinones have emerged in the United States (Rech, Donahey, Dziedzic, Oh, & Greenhalgh, 2015). Some of these may contribute to sexual risk behaviors and have the potential to be injected (Giese et al., 2015).

Evidence-Based Interventions for PWUD

There are four key evidence-based interventions to reduce HIV risk in PWUD, all of which present opportunities for use by nurses in various roles: needle/syringe programs (NSP), medication-assisted drug treatment (MAT), engagement in the HIV care continuum (including ART), and pre-/post-exposure prophylaxis (PrEP/PEP). NSP, MAT, and ART have been shown to reduce HIV incidence in PWID in settings where they have been implemented in combination and at a public-health scale; the evidence for these interventions is well-established (Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; Eaton et al., 2014; Milloy et al., 2015; Rhodes, Sarang, Vickerman, & Hickman, 2010; Vickerman et al., 2006).

As a result of the robust evidence base for these interventions, the World Health Organization (WHO, 2014) outlined a comprehensive package of evidence-based HIV-related recommendations for key populations, which included (but was not limited to) harm reduction services for substance use (i.e., NSP, MAT) as well as HIV treatment and care. While the use of PrEP/PEP has only more recently been added to the HIV prevention toolbox, promising results have led to their inclusion in HIV prevention recommendations (Blashill, Ehlinger, Mayer, & Safren, 2015).

A recent Surgeon General's report on addiction also reaffirmed the need for NSP and MAT as a part of a national strategy to address substance misuse and the related harms (USDHHS Office of the Surgeon General, 2016). However, despite robust evidence supporting these interventions, access and utilization have been low, indicating that further research, policy, and advocacy efforts to achieve wide-scale implementation of these interventions are needed. NSP are not widely available in all states, MAT demand outstrips availability in some settings, and many PWUDs living with HIV have not achieved viral suppression. Stigma and discrimination continue to be key barriers to effective implementation and widespread uptake of these interventions.

Needle/Syringe Programs

Harm reduction programs such as NSP include services aimed at reducing the negative consequences of drug use. Such services include provision of clean syringes and needles (often in exchange for used ones) in addition to other paraphernalia for injecting (e.g., drug cookers, sterile water, filtration cotton, tourniquets), paraphernalia for smoking drugs (e.g., pipes, foil), and condoms. Many harm reduction programs connect their clients to a variety of other services, such as health care, substance use treatment, and social services. Harm reduction programs may be the first point of engagement for PWUD, particularly PWID.

There is ample evidence that syringe exchange programs reduce risk for HIV and reach high risk PWID (Abdul-Quader et al., 2013; MacArthur et al., 2014; Normand, Vlahov, & Moses, 1995; Wilson, Donald, Shattock, Wilson, & Fraser-Hurt, 2015). A recent systematic review of structural-level NSP (i.e., programs that provided syringes to at least 50% of PWID and 10 or more needles per PWID per year) reported reductions in HIV prevalence in U.S. programs that ranged from 15% to 43% (Abdul-Quader et al., 2013). However, provision of syringes falls substantially short of meeting the need; in the United States, the number of syringes distributed by NSP has declined from 22 syringes/year/PWID in 2007 to 15 syringes/year/PWID by 2012 (Degenhardt et al., 2014; Mathers et al., 2010), in comparison to the Joint United Nations Programme on HIV/AIDS and World Bank Global HIV/AIDS Program (2009) recommendations of 100–200 syringes/PWID/year. Moreover, as of June 2014, only 33 U.S. states had NSP (American Foundation for AIDS Research, 2016).

Medication-Assisted Treatment

In the United States, MAT for opiate dependence takes the form of methadone, buprenorphine, or naltrexone prescriptions. A large and consistent literature has shown that MAT reduces risk of acquiring and transmitting HIV infection (MacArthur et al., 2012; MacArthur et al., 2014; Wilson et al., 2015). A recent meta-analysis estimated a 54% reduction in risk for HIV among PWID on MAT (MacArthur et al., 2012). In the United States, approximately 13% of PWUD are receiving MAT (Mathers et al., 2010). Nurses are employed in many addiction treatment centers, where they screen for, administer, and evaluate MAT. They also screen patients for substance use and facilitate access to treatment to support reductions in HIV risk. With passage of the Comprehensive Addiction and Recovery Act (2016) by the U.S. Congress, nurse practitioners are eligible for education about prescriptions for and maintenance of buprenorphine treatment for severe opioid disorder.

ART and the HIV Care Continuum

Adherence to ART, leading to an undetectable viral load, has been shown to prevent HIV transmission (Iwuji et al., 2015). Engagement in HIV care has been described along a continuum that starts with diagnosis of HIV infection. Patients must then be linked to care, retained in care, prescribed ART, and maintained on ART to achieve viral suppression (Gardner, McLees, Steiner, Del Rio, & Burman, 2011). Despite the immense potential of ART, there are critical gaps in the HIV care continuum in the United States generally and for PWID specifically (Castel, Magnus, & Greenberg, 2015; Mathers et al., 2010; Maulsby et al., 2015). Although estimates have been inconsistent even across CDC reports (Bradley et al., 2014; CDC, 2013; Hall et al., 2013; Spiller, Broz, Wejnert, Nerlander, & Paz-Bailey, 2015), the 2012 CDC National HIV Behavioral Survey of 10,000 PWID in 20 U.S. cities reported that approximately 63% of those with HIV infection had been diagnosed (Bradley et al., 2014). Only 34%–42% of PWID with HIV infection in the United States were on ART and 23%–34% were virally suppressed based on studies reported in 2014–2015 (Risher, Mayer, & Beyrer, 2015). Rates of patient engagement along the HIV care continuum have not been estimated for non-injecting PWUD because non-injection drug use is not part of routine U.S. HIV surveillance and reporting activities (Blair et al., 2014).

PrEP and PEP

Pre-exposure prophylaxis (PrEP) has been shown to reduce HIV infection in PWID by 50% (Choopanya et al., 2013; Escudero, Lurie, Kerr, Howe, & Marshall, 2014). PrEP access is not widespread and uptake has been slow for gay, bisexual, and other MSM in the United States (Goedel, Halkitis, Greene, Hickson, & Duncan, 2016; Holloway et al., 2016; Strauss et al., 2016). Data are not widely available for PrEP uptake by PWUD, but one study of 304 PWID in Washington, DC, reported that none of the participants had taken PrEP (Kuo et al., 2016). PWUD meeting clinical guidelines for PrEP may have significant problems with adherence because of factors that define substantial risk, including high levels of substance use, homelessness, depression, and other circumstances and traits that may interfere with daily pill-taking (Aidala et al., 2015). A report from an international PWUD organization described several concerns about PrEP for PWUD, including the feasibility of PrEP; the ethics of PrEP, given suboptimal coverage of the community with ART; and advocacy for PrEP potentially undermining advocacy for harm reduction (Guisse, Albers, & Strathdee, 2016; International Network of People who Use Drugs, 2015). Few studies have been reported using post-exposure prophylaxis (PEP) with PWUD; however, one trial with methamphetamine-using MSM reported that PEP was safe, feasible, and acceptable as a prevention strategy (Landovitz et al., 2012).

The Critical Roles of Nurses in HIV Prevention and Care for PWUD

Nurses and nurse practitioners fulfill many roles in health care settings: They provide direct patient care, deliver community and consumer education, and act as program administrators. They also engage in research. These roles are critical in helping to reduce HIV transmission and the negative consequences of substance use and HIV, and in improving the health of PWUD. Guided by the HIV/AIDS Nursing Scope and Standards (American Nurses Association [ANA], 2015; ANA & ANAC, 2007; ANAC, 2016), nurses provide care that conforms to ethical guidelines along the continuum of prevention and treatment and can provide much-needed services and interventions for PWUD. The high quality of nursing care for PLWH was reported as early as 1993, when Aiken et al. (1993) examined outcomes of nurse practitioners' roles as primary providers to PLWH and reported that outcomes of nursing care equaled and, in some areas, surpassed the quality of care provided by physicians. Nurses were found to be ideally situated to support the continuum of care as direct providers and team members (Wilson et al., 2005).

The *HIV/AIDS Nursing Scope of Practice and Standards* (ANA & ANAC, 2007) described the nursing care continuum of prevention, diagnosis, and treatment to end-of-life palliative care. Intervention along the continuum included harm reduction, screening, health maintenance, and episodic care in the management of PLWH, as well as delivery of substance use services. In addition to providing direct patient care, nurses in supervisory or management roles worked with care teams to develop and evaluate services for PWUD. The following briefly describes some common nursing activities.

Harm Reduction

Nurses can play a central role in the care of persons with addiction disorders, who may be at risk for, or have, HIV infection. Research has indicated that applying the principles of harm reduction to the care of patients who use drugs effectively helps patients adopt healthy behaviors and improve the status of their health (Bartlett, Brown, Shattell, Wright, & Lewallen, 2013). Mutual mistrust can arise, however, in health care encounters between PWUD and care providers. For providers, this mistrust is characterized by a fear of being deceived or manipulated about drug using patterns and perceptions that PWUD are uncooperative and non-adherent to clinical recommendations. These challenges may result from PWUD lacking the resources to facilitate cooperation and adherence and care providers with insufficient education about treatment of substance use disorders and their consequences. Patients who use drugs fear mistreatment, and many report prior experiences of feeling stigmatized, judged, and devalued by providers (Merrill, Rhodes, Deyo, Marlatt, & Bradley, 2002).

Harm reduction is consistent with ethical codes for nursing (ANA, 2015; Canadian Nurses Association, 2011), which require providing ethical, compassionate, and evidence-based care, and the promotion of respect, dignity, and justice for patients. Upholding patient autonomy in decision-making may include acceptance of an individual's choice to continue to use drugs. Applying the philosophy of harm reduction to nursing practice, the focus would then be shifted from abstinence to preventing or treating the health consequences of addiction. PWUD have demonstrated in multiple circumstances that they are willing and interested in changing behavior to improve their health, and to protect the health of their family members and other drug users. A clear example of this is the response to the HIV epidemic in New York City, where syringe sharing by PLWH who injected drugs dropped precipitously once the risk of HIV transmission was understood (Des Jarlais et al., 2004).

There have been relatively few studies of harm reduction and nursing practice, but the results showed a positive effect of this approach on patient engagement in care (Canadian Nurses Association, 2011). The AIDS Prevention Street Nurse Program in Vancouver, Canada, was initiated in response to an outbreak and persistent epidemic of HIV among PWID (Hilton, Thompson, Moore-Dempsey, & Hutchinson, 2001). The outreach, trust-building, and HIV and sexually transmitted infection screening and treatment activities of the program were rooted in a nonjudgmental, harm reduction approach. The nurses helped individuals navigate the health care system and applied advanced practice knowledge and skills to address the health care needs of the people they reached. Nurses have held key roles in safe injection education programs, where PWID are taught to inject drugs in ways to avoid exposure to blood-borne viruses (HIV, HCV) that lead to chronic infections, and exposure to bacteria that cause tissue infections and abscesses (Wood et al., 2008). A safe injection education program led by nurses resulted in reductions in syringe and other equipment sharing and increased skills in self-injecting with minimal risks (Wood et al., 2008).

Screening

A new emphasis on screening by registered and advanced practice nurses has emerged from the Institute of Medicine Future of Nursing Report (Institute of Medicine, 2011), which

encouraged nursing practice to fully implement education and expand nursing roles. Screening is now considered central to registered nurse and advanced practice nurse roles, and screening for substance use is identified as an important nursing intervention in the recent Surgeon General's report on *Facing Addiction in America* (USDHHS, Office of the Surgeon General, 2016). Screening tools to identify PWUD who may be at risk for HIV can identify the need for further assessment of those who need referrals for drug treatment or harm reduction services (e.g., NSP). Screening may also provide opportunities for discussions about the importance of condom use and other risk reduction practices. For those who are HIV-infected, screening for mild-severe substance use disorders provides an opportunity to discuss the patients' challenges to adhere to ART and the negative impacts of substance use (including alcohol and tobacco) on overall health, and to refer for drug treatment as needed and requested.

Tools for Screening for Substance Use

Screening, Brief Intervention, Referral to Treatment (SBIRT) is an integrated approach to screening and intervention for PWUD (Babor et al., 2007). In the last decade health care and professional organizations and nurse faculty have been training students, faculty, and practicing nurses to speed the practice uptake of this intervention. Endorsed by SAMHSA and WHO, its success in decreasing alcohol consumption, when applied in a range of primary care and specialty outpatient settings, is well documented (Babor et al., 2007; Bien, Miller, & Tonigan, 1993; Kaner et al., 2009). While SBIRT has shown some promise when used with other drugs (USDHHS Office of the Surgeon General, 2016), research findings have indicated its efficacy may be limited (Saitz, 2014). The U.S. Preventive Services Task Force (2016) now recommends the use of SBIRT in primary/episodic care settings to screen for excess alcohol use in adults and older adults

Several brief screening tools have been developed. These include the Alcohol Use Disorders Identification Test (AUDIT), the shorter Alcohol Use Disorders Identification Test-Consumption (AUD-C), and the WHO-endorsed Alcohol, Smoking, Substance Involvement Screening Test (ASSIST; Humeniuk, Henry-Edwards, Ali, Poznyak, & Monteiro, 2010; USDHHS Office of the Surgeon General, 2016). An audio computer-assisted self-interview version of the ASSIST was recently assessed in primary care and found to be an appropriate and feasible approach to screening (Spear, Shedlin, Gilberti, Fiellin, & McNeely, 2015). The CAGE, commonly taught to health professionals to screen for alcohol problems, lacks specificity for mild to moderate alcohol use disorders and is not a recommended screener. Other brief screening tools to identify drug-related problems include the Drug Abuse Screening Test (DAST; Skinner, 1982) and the Drug Use Screening Inventory (DUSI; Tarter & Kirisci, 1997). Screening outcomes direct the nurse to (a) engage the patient in a brief intervention and/or (b) refer the patient with a positive screen for evaluation, treatment, or other services.

With the patient's permission for a dialogue, the nurse can identify risky substance use patterns that result in or contribute to health problems. This discussion may include reviewing evidence of health impact (e.g., biological markers such as elevated liver enzymes), or patient-reported negative consequences (e.g., depression). Emphasis is on a

brief 5- to 10-minute dialogue in a nonjudgmental approach to discuss patient assumption of personal responsibility for change, if desired, and the potential for improved health outcomes.

Implementation and Research

Despite extensive literature on evidence-based interventions for HIV-related prevention and care for PWUD, many of these interventions have not been widely implemented. Future directions for nurse researchers could include studies to evaluate or enhance intervention implementation and to develop and evaluate new models of care for PWUD. These approaches are especially needed for PWUD considering that this population continues to experience disparities in access to care and disease outcomes. The research questions generated by clinical care and changing health care systems provide many opportunities for research, including comparisons of the efficacy of the new care models in understudied populations such as older adults with HIV and new populations at risk from the emerging PO epidemic.

Nurse scientists and clinicians have contributed to HIV research since the start of the epidemic, including Kurth (Simoni et al., 2006), Van Devanter (Van Devanter et al., 2002), Holzemer (Kataoka-Yahiro, Portillo, Henry, & Holzemer, 1996), and Jemmott (Jemmott, Jemmott, & Fong, 2010). Colleges of nursing and professional organizations have centers supporting nursing research on HIV, and ANAC annually funds nurse researchers through the American Nurses Foundation research collaborative, encouraging early and mid-career investigators to continue generating knowledge in this area. While nursing endorses evidence-based practices, the uptake of evidence-based interventions by practicing nurses often lags behind scientific evidence, especially in settings such as substance abuse treatment programs with high need but few HIV nurse specialists. Factors found to be important in engaging clinical nurses in research and disseminating evidence-based practices include interest, leadership, and issues related to accessing research resources and networks (Scala, Price, & Day, 2016). Adapting and clinically evaluating interventions or conducting small feasibility studies of new approaches with research teams in specific research settings will enhance knowledge generation. In health care delivery systems, nurses continue to participate in research through data collection, administrative support, and participation in report writing and publication.

Nursing remains the nation's largest health care profession. With continued changes in the U.S. health care delivery system, it is likely that the care of PWUD and persons with substance use disorders will increasingly be integrated in general care settings. In order to allay consumer anxieties about receiving specialty care and obtaining needed referrals, health care providers must address learning gaps about HIV treatment and its interface with substance use treatment. Nurses specializing in HIV care are uniquely positioned to lead education and practice initiatives for this population. Access to information on evidence-based interventions as well as dissemination of the *HIV/AIDS Nursing: Scope & Standards of Practice* (ANA & ANAC, 2007) to non-specialist nurses will contribute to quality of care and improved patient access to HIV care and behavioral health.

Conclusion

We have summarized evidence-based interventions for PWUD and highlighted some of the roles that nurses can play in HIV prevention and care for this population. The nursing profession, based on its mission and professional reach, is uniquely situated to continue to influence quality health care for PWUD, especially those at risk for or infected with HIV.

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Key Considerations

- Substance use plays a key role in HIV prevention and treatment efforts.
- The prescription opioid misuse epidemic poses a threat to ending the HIV epidemic.
- Nurses can utilize evidence-based interventions for people who use drugs, including needle/syringe programs, medication-assisted treatment, engagement in the HIV continuum of care, and PrEP/PEP.
- Roles of nurses in HIV prevention and care include applying harm reduction principles, screening for substance use, referring patients for substance use care, and conducting research.