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Needle exchange programs and their impact on HIV incidence in West Virginia: Is it working?

Amber Graves

Katie Duty

Thomas Norton

Alberto Coustasse

Amber Graves, MHA
Health Administration Program
Lewis College of Business
Marshall University
100 E. Peyton Drive
hogsett4@live.marshall.edu
South Charleston, WV 25303
304-746-1968
Katie Duty, MHA
Health Administration Program
Lewis College of Business
Marshall University
100 E. Peyton Drive
duty35@live.marshall.edu
South Charleston, WV 25303
304-746-1968
Thomas Norton, CPA, J.D., LL.M
Assistant Professor of Accounting
Marshall University
Lewis College of Business
Brad D. Smith Schools of Business
226 Corbly Hall
One John Marshall Drive
Huntington, WV 25722
norton7@marshall.edu
304-696-2670

Stacie Deslich, MA, MSHA
DBA Candidate
Marshall University
Lewis College of Business
Brad D. Smith Schools of Business
One John Marshall Drive
Huntington, WV 25722

deslich1@marshall.edu

304-951-7478

Alberto Coustasse, Dr.PH, MD, MBA, MPH

Professor

Health Care Administration Program

Lewis College of Business

Marshall University Graduate College

100 Angus E. Peyton Dr.

South Charleston, WV 25303

coustassehen@marshall.edu

304-746-7968

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ABSTRACT

Needle Exchange Programs (NEP)s were created to help users exchange used needles for new sterile ones and become aware of treatment and rehabilitation options. This study aimed to determine the effectiveness of NEPs and their impact on reducing HIV and Hepatitis C infections in West Virginia and decreasing health care costs for the community. Based on studies conducted on the past implementation of needle exchange programs, it is suggested that there has been evidence that closing these programs can have a broad societal impact on the spread of HIV and hepatitis C and the associated costs.

Key Words: Hepatitis C, HIV, Needle Exchange Programs, Opioids, syringe service programs, West Virginia

INTRODUCTION

The United States (U.S.) has experienced continued increases in opioid abuse and overdose deaths, which has made many communities susceptible to a rise in human immunodeficiency virus (HIV) and Hepatitis C virus among people who use intravenous drugs.[1] Increased prescription of opioid medication had caused the misuse of both prescription and non-prescription opioids before it had shown that they have been highly addictive.[2] It has been estimated that 21% to 29% of patients prescribed opioids for chronic pain have misused those medications.[3] The National Institute on Drug Abuse (NIDA) has reported that these prescriptions include pain relievers and synthetic opioids such as fentanyl.[3] In the U.S., each year, the Centers for Disease Control and Prevention (CDC) has reported that the prescription opioid epidemic has cost $78.5 billion, which includes health care, lost productivity, addiction treatment, and criminal justice involvement.[4]

One of West Virginia's most prominent public health issues is the opioid crisis.[5] The opioid epidemic has been a dual challenge involving prescribed opioids, such as OxyContin, and illicit opioids, including heroin and fentanyl.[6,3] In West Virginia, on average, one life is lost every 10 hours related to opioid misuse.[6,3] For many years, opioid overdoses have been the number one cause of death in drug overdoses in the State of West Virginia.[7] In 2017, there were 70,237 drug overdose deaths in the U.S. In West Virginia, those deaths were 57.8 per 100,00 residents.[8]

Needle exchange programs have operated by exchanging used hypodermic needles, syringes, and other drug preparation tools for clean, sterile equipment and safely disposing of used materials at no cost to the patients.[9] Additional services offered are preventive tools such as counseling, condoms, vaccinations to protect against HPV, viral hepatitis, and other sexually transmitted diseases, referral to substance use disorder treatment and medication-assisted treatment, referral to medical, mental health, and social services, education about overdose prevention, and safer injection practices.[10] In 2007, the CDC reported 185 needle exchange programs across 36 states, including the District of Columbia and Puerto Rico.[10] There have also been studies that have proven that needle exchange programs have been cost-effective compared to treating a patient with HIV.[10,11] It has been shown that the cost of preventing HIV infection through needle exchange programs has ranged from $4,000 - $12,000 compared to treatment for a patient with HIV, which can cost up to $190,000.[11] Nguyen showed that for every dollar invested in needle exchange programs, at least $6.00 in averted cost associated with HIV is saved.[12]

Over 50% of programs have been administered through non-governmental organizations but operated with guidance from local and state health departments.[10,13] These programs also assumed legality under various structures that differed from state to state.[13] The federal government banned using federal funds to support needle exchange programs in 1998 through an amendment to the Department of Health and Human Services Budget.[14] When the needle exchange program ban was lifted from 2009 to 2011, there was an increase in needle exchange programs, with 221 programs that received state or local funding.[14] There have been emerging cases of viral hepatitis infections within suburban and rural areas in West Virginia, specifically

between 2011-2015 hepatitis C virus increased by 36%, calling attention to the lack of preventive services in these areas.[14]

The increase in the Hepatitis C virus and intravenous drug use in rural areas between 2011-2015 caught the federal government's attention. In December 2015, Congress released the FY16 Omnibus Bill that partially lifted the ban on using federal funds for needle exchange programs.[1] This bill required that funds could not be used to buy needles and syringes but could be used for other services related to diseases such as HIV and viral hepatitis infections that result from intravenous use.[1] The U.S. Department of Health and Human Services released new guidelines in 2016 to help implement this change in law for facilities seeking to use federal funding to support needle exchange programs.[15] These guidelines stated that for the state, local, tribal, and territorial health departments to qualify for funding, they must consult with the CDC.[15] In addition, it is necessary to provide evidence that they are either experiencing or at risk for significant increases in hepatitis C virus infections or an HIV outbreak due to intravenous drug use.[15]

As of 2016, there was an estimated 2.4 million cases of Hepatitis in the U.S.[16] On average, one-third of the nation’s 18–30-year-olds were infected with Hepatitis C.[16] Sixty to ninety percent of Hepatitis C cases were due to individuals who injected themselves with drugs.[17] In West Virginia, the abuse of injectable drugs had caused an outbreak of Hepatitis C infection.[18] Between 2010 and 2016, the acute HBV rate rose 300% (4.7 to 14.5 per 100,000 persons), a 700% increase in the acute HCV rate (1.1 to 7.2 per 100,000 persons).[18]

West Virginia's Unique Context

Before discussing needle exchange programs, it is imperative to note that West Virginia is unique in several ways that may impact opioid addiction, treatment, and needle exchange programs and disease.

West Virginia is the only state that lies entirely within the borders of the Appalachian region of the United States.[19] West Virginia is also one of the nation's poorest states regarding household income.[20] In 2021, the median household income in West Virginia amounted to $46,836 compared to the U.S. median of $70,784, making it the 49th poorest state, just above Mississippi (50th), had a median household income of $46,637.[20] It has been in the top five poorest states for several decades.[21] Additionally, West Virginia has been identified as an area of chronic Poverty.[22] Shepherd described chronic Poverty as people experiencing deprivation over five years, often over their entire lives, and that deprivation is intergenerational.[22] Chronic Poverty is multi-dimensional and has far-reaching consequences across geographic locations, cultures, and families. In terms of poverty rate, West Virginia ranked 46th poorest state with a poverty rate of 15.8%.[23] West Virginia also has ranked high in unemployment in the United States year after year and, as of August 2022, had an unemployment rate of 4%, placing it as the 38th worst employment rate compared to a 3.5 % U.S. mean poverty rate.[24] Education attainment has been strongly correlated with median incomes.[24] In West Virginia, the percentage of people aged 25 years or older who earned a bachelor's degree or higher was 21.3% in 2020.[24] This rate decreased to 19.9% in 2022, giving West Virginia the lowest percentage of this educational attainment in the U.S. compared to a mean of 37.9%.[24]

These factors have placed West Virginia in a unique situation to be vulnerable to opioid abuse and addiction. Isolation, rurality, Poverty, and employment in dangerous industries such as

coal mining and manufacturing set up the perfect storm for addiction in the state.[25] Those who gain employment in industries that pay a living wage are often injured and then prescribed opiates for pain management by well-meaning physicians or sometimes by medication mills.[26]

Coombs identified several features of West Virginians that he asserted led to the opioid crisis in the state.[27] West Virginians were 37% more likely to die from alcohol, prescription drug, or illegal drug overdose than any other state in the nation.[27] Further, people aged 25 to 44 had a 70% higher death rate than the rest of the U.S.[27] The author associated the coal industry, addiction, and generational trauma, stating that these factors kept the state in perpetual crisis.[27] This scholar reported that the counties with the highest rates of addiction, unemployment, lower educational attainment, more violent crime, and more family violence were also the counties where the coal companies operated.[27]

Similarly, Coombs described the generational trauma caused when the coal companies initially moved to the region, displacing families to build mines and exploiting the region's physical and human resources.[27] Additionally, it has been noted that the general level of educational attainment was lower than the nation, which is attributed to unemployment, willingness to work for the coal companies, and continued Poverty.[28] The coal boom was speedy, and residents of the state had little ability to retain a hold of their land and resources.[29] Soon, the coal companies were not only the largest employers in the state but also the homeowners, landlords, merchants, law enforcement, public service, school, church, and entertainment.[27,29] West Virginians were utterly dependent on the companies who continued to exploit the land and the people, often destroying mountains while keeping their employees impoverished and indebted to the coal companies.[27,29] This situation, combined with the influx of opioids into the

state, has led to a significant crisis.[27,29] Needle exchange programs are one of the options available to curb opioid abuse and overdose.

This study aimed to determine the effectiveness of needle exchange programs and their impact on reducing Hepatitis C infections in people who inject drugs in West Virginia, as well as their impact on cost savings in healthcare.

METHODOLOGY

The research was a qualitative study using mixed methodologies with a literature review followed by a systematic approach to needle exchange programs in West Virginia. This study hypothesized that incorporating the West Virginia Needle Exchange Program has decreased the number of hepatitis C virus spread through needle sharing among injection drug users and decreased healthcare costs. This study was conducted in two stages: 1) literature identification and collection and 2) literature analysis and categorization using a PRISMA diagram.

Step 1: Literature Identification and Collection

During the research, the following keywords were used: 'syringe service programs,' or 'needle exchange program,' and 'United States or 'West Virginia,' and 'advantages,' or 'disadvantages' or 'effectiveness' and 'Hepatitis C,' or 'HCV OR HIV.' Combining the keywords and including 'and' or 'or' available topics was narrowed to meet criteria needs. Because the literature review was intended to study needle exchange programs across the U.S. and West Virginia, it was important not to exclude various geographical areas. Therefore, the research was conducted through a literature review of needle exchange programs within the United States and West Virginia in Academic Search Premier, Business Source Premier, Point of View Reference

Center, Alt-Health Watch, PubMed, and Google Scholar. These databases were chosen based on their article availability and the volume of relevant sources. Reputable websites of the Centers for Disease Control and Prevention were also studied.

Step 2: Establishment of Inclusion Criteria and Literature Analysis

The search was limited to articles published between 2007 and 2020 in the English Language. The search applied to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flowchart and identified (N=613) relevant citations. References were excluded (N=547) if they did not meet inclusion principles. Citations included were (N=45) and were relevant to the opioid epidemic and needle exchanges in West Virginia and the U.S. These 39 references were subject to full-text review and included in the data abstraction and analysis. Twenty references were used in the results section.

RESULTS

Needle Exchange Programs in the U.S.

According to Des Jarlais and colleagues, in March 2014, approximately 204 Syringe Service Programs (SSPs) were operating throughout the U.S.[30] These authors conducted a study with the North American Syringe Exchange Network, Mount Sinai Beth Israel, and 153 SSPs.[30] They participated in a mail/telephone survey to determine the locations and demographics of the programs.[30] The programs were differentiated into rural, suburban, and urban development environments.[30] The West had the highest number of rural SSPs, with 30%, while the South had the least at 7%.[30] The West had the most suburban SSPs with 15%, while the South and Puerto Rico tied for the least amount at 0%.[30] For urban SSP locations, the South had the highest

percentage at 86%, while the West had the lowest rate at 51%.[30] In 2019, at least 320 needle exchange programs were in the United States.[30]

According to a report from the Kaiser Family Foundation, needle exchange programs are presently legal in 28 states, and legislators in Arizona, Florida, Iowa, Missouri, and have introduced bills to legalize needle programs in their states.[31] With the spread of injection drug use into small towns, attitudes about needle exchange programs have evolved.[32] Concern about the opioid crisis in rural America led to the Trump administration's support of needle exchange programs.[33] Once concentrated in big cities like New York and Philadelphia, needle exchanges can now be found in rural Tennessee and West Virginia communities.[31]

Funding for Needle Exchange Programs in West Virginia

To receive federal funding, health departments must consult with the CDC and provide evidence that they have been experiencing and are at risk for hepatitis infections or an increase in HIV outbreaks.[34] The CDC stated that federal funding could be used for certain services, such as testing and treatment, and other expenses associated with the program, including staff, vans to provide treatment in outlying areas, substance use counseling, referral to treatment, and outreach in at-risk communities.[34] However, they cannot be used to purchase sterile needles or syringes for illegal drug injection.34 In 2015, the West Virginia Department of Health and Human Resources (WVDHHR) reported that West Virginia had been awarded $600,000 in grant funding from the State Target Response to the Opioid Crisis Grant to support the harm reduction program, including the needle exchange program.[35] Eleven programs received funding, eight of which were given the funds to expand their existing services and create three new applications.[34,35] The programs were designed to reduce the spread of infectious diseases like Hepatitis C and HIV.[34]

The Consolidated Appropriations Act of 2016, signed by President Obama, has been the most recent federal legislation allowing funding to support specific components of needle exchange programs, including personnel testing kits, syringe disposal services, educational materials, and condoms.[10] The Act stated that current laws prohibit using federal funds to purchase sterile needles or syringes for drug use.[10] Therefore, the CDC determined which entity demonstrated a need based on federal law.[10] In 2017, three programs in West Virginia expressed the need for a needle exchange program, which included Kanawha, Cabell, and Berkeley Counties.[10]

Needle Exchange Program Locations in West Virginia

Needle exchange programs have allowed individuals whose lives have been affected by opioids to engage in dialogues about treatment and recovery.[36] Programs in West Virginia include Huntington, Vienna, Fayetteville, Augusta, Fairmont, Wellsburg, Wheeling, Pineville, Morgantown, and Parkersburg.[37] In addition, all departments have been opened one day a week for treatment and education to stop the spread of infectious diseases, such as Hepatitis C and HIV.[38]

West Virginia's Need for Disease Control for Persons Who Inject Drugs

HIV and Hepatitis C have been growing concerns for West Virginia with the increase of PWIDs in the state. In 2015, approximately 74 West Virginians were diagnosed with HIV.[38] Additionally, between 2011 and 2015, the rates of HCV increased in West Virginia by 36%.[16] Between 2008 and 2010, intravenous drug users comprised 10% of HIV transmission cases in this state.[39] Needle exchange reduction programs have been implemented throughout the state as West Virginia has ranked the worst in the U.S. for drug overdoses and cases of Hepatitis C.[3]

Furthermore, 28 counties in West Virginia have been deemed high risk for HIV, and hepatitis C spread among individuals who use needles to inject drugs.[40] In September 2015, West Virginia's first needle exchange program opened in Huntington.[41] The program had immediate results, with a reduction of overdose deaths by 40% by the first quarter of 2016 compared to the same time in the previous year.[41] Although the program has seen many patients come through with an average of 150 visitors a week, there has been growing concern that there is enough time to create enough programs to counter the rising hepatitis C virus.[41,42] Phillips et al. reported that in 2018, the cost per cure for individuals with Hepatitis C was $188,859.[43] The vast increase in the incidence of Hepatitis C in West Virginia forebodes a considerable increase in health costs for the state. However, treatment did not include other healthcare services that may need to be provided, such as emergency room visits or having the paramedics bring someone back to life. From 2014 to 2016, Hepatitis C cases decreased from 2.7 to 3.9 million to 991,447.[38]

The Kanawha-Charleston Health Department Needle Exchange Program closed its doors in the Spring of 2018. One of the primary reasons cited by the mayor was issuing 40,000-50,000 needles a month without an accounting of needles returned, which created a perceived issue of needles littering the streets.[31] Also, Charleston's needle exchange program was shut down due to increased crime and individuals coming from other counties and abusing the needle exchange program.[45]

Prevention through Exchange Programs in West Virginia

The needle exchange has improved public health by reducing the risk of disease spread and helping the substance use disorder epidemic.[5] For example, Bixler reported that Appalachia experienced an increase in hepatitis C virus-related drug users; however, using needle exchange programs, the transmission of the virus has been projected to be reduced by 56%.[46] In addition,

programs in West Virginia are neither prohibited nor expressly permitted by state law, which allowed West Virginia to fund a program at the Cabell-Huntington Health Department in 2015.[46] By 2017, West Virginia had nine operating programs that served an estimated 4,376 clients. [46]

Like any program, some risks are associated with the needle exchange program. Needle exchange programs enable drug users to access clean needles; thus, it is argued that it increases the community's injection drug use and drug use.[47] There is also the risk of potentially infected needles being discarded in public locales with the attendant risk of getting stuck by the needle.[47] Some have argued that this risk can be offset by accounting for or requiring the submission of used needles before furnishing sterile ones. It was also indicated that another related fear was increased crime in a community or near the needle exchange sites.[47] Exchange programs in West Virginia have reduced not only the amount of transmission of HIV and blood-borne viruses.[40] However, they have offered other services such as advice on safer injecting practices, minimizing the harm done by drugs, education on how to avoid and manage an overdose, and referrals to other healthcare services.[40] The exchange programs have not encouraged individuals to use drugs but have forced drug users to engage with those equipped to help mitigate risky behavior and unsafe sex.[48]

DISCUSSION

This study aimed to determine the effectiveness of needle exchange programs and their impact on reducing Hepatitis C infections in people who inject drugs in West Virginia. Since the reimplementation of federal funding to needle exchange programs in December 2015, the spread of HIV and hepatitis C has decreased. In addition, the costs associated with treating persons who inject drugs to limit or stop the spread of HIV and hepatitis C virus have been much lower than those who have already been infected. Diagnosing HIV and HCV should not be limited to

substance abuse facilities. Prevention programs, including needle exchange programs, can collaborate with individuals and offer infectious disease testing and other services.

West Virginia has one of the country's highest usage of prescription pain relievers. Opioid abuse has been a significant cause of death in overdoses. Over the years, prescribed opioids for pain have been inappropriately used. Several drugs were double or triple-filled, causing overlapping prescriptions. Further, various users circumvented the time release function by grinding up the pill for immediate high-dose access. When users could not get the prescriptions in dosages sufficient to stave off withdrawal symptoms, they turned to drugs like heroin and fentanyl.

The community must be educated on addiction and unite to battle this epidemic. Several addicted patients have been through some trauma that frequently contributes to their addiction. There is a growing branch of thought that trauma, especially childhood trauma, is one of the leading factors in susceptibility to addiction. For those battling addiction and undergoing treatment, having a support system from peers or family members to overcome the addiction is essential. PROACT is an outpatient treatment facility dedicated to reducing the impact of addiction in the community. This facility has provided education, assessment, intervention, and treatment solutions. It has brought together community behavioral, social, and medical resources to treat patients suffering from addiction effectively. PROACT has assessed patients following discharge from local emergency rooms and inpatient detox units and has referrals from quick and emergency response teams. This facility has also accepted self-referrals and referrals from community providers.

The exchange program's purpose was to give drug users a way to reduce the harm of reusing needles and receive the help they need. However, the program has offered more than

exchanging needles, including making an opportunity for free testing and screening, rehabilitation, providing advice on safe drug use, and sex education.

Needle Exchange Programs have been controversial aspects of public healthcare due to conflicting beliefs and opinions about public policies. The legislation also unresolved in Congress to uplift the long-standing ban on using federal funds to pay for hypodermic needles. Those in favor of the needle exchange program have cited national and international studies showing that similar programs have reduced the incidence of disease transmission along with cost savings. The U.S. Department of Justice in Philadelphia has appealed to prevent opening a nonprofit Safehouse where users can get free needles and inject drugs in monitored conditions.[50] In February 2020, a federal judge published a decision granting the nonprofit permission to open the nation's first supervised injection in South Pennsylvania.[50] However, due to robust neighborhood opposition from the community leaders, the opening was canceled days after the federal ruling.[51] After the initial federal ruling, the case was appealed to the United States Court of Appeals of the 3rd Circuit.[50] The Third Circuit found that opening a safe-injection site would violate the Controlled Substances Act, prohibiting owning or maintaining drug-involved premises.[50] That decision was appealed to the Supreme Court, which denied certiorari.[50] In the Opinion of the Court, they noted that safe-injections sites did admirably seek to save lives and help move our view in America from law enforcement to harm reduction; however, the laws as currently written do not allow for such a site.[50] They stated that Congress would need to carve out an exception to be able to operate a safe injection facility in America.

The Department of Justice Office of Public Affairs then echoed the sentiment in a public release stating that Pennsylvania's rule of law is still alive and well.[52] New York and Rhode Island have sought or opened safe injection sites despite questionable legality.[52] The first safe

injection site was opened in New York in 2021.[52] In Rhode Island, while there has been a plan for safe injection sites as of the publication of this article, they have yet to be established.[52] Several even smaller municipal units, such as cities like San Francisco and Seattle, also seek to establish safe injection sites.[52] Many operate without local, state, or federal support and tend to operate under the radar.[52]

The data from safe injection sites is even better than just needle exchange programs.[54] A study of one unsanctioned safe injection site in the United States operated from 2014 through 2019, overseeing over 10,000 injections, and not a single overdose death was recorded.[54] No single patient was required to be seen by an outside medical institution.[54] The staff could reverse dozens of overdoses with naloxone, and presumably, the blood-borne illness rate was negligible or nonexistent because they used new equipment for every use.[54] Like needle exchange programs, safe injection facilities have been seen as problematic by some. The idea was that having such a site would encourage drug use, but that has not been widely validated. In a systematic review of seventy-five articles, the rate of drug use was found to not increase amongst the studied population using safe injection facilities.[55] At the same time, harm was notably reduced.[55] As with any program that allows drug use but attempts to reduce harm, there is usually opposition from all levels of government.

Those who oppose the programs have focused on moral concerns that needle exchange programs encourage drug use and send a negative message about government support of drug use by funding programs instead of condemning individuals who use drugs.[56] Many political leaders and law enforcement officials view needle exchange programs as encouraging drug use, especially those representing rural, predominantly Republican constituents.[57] NEPs were not a moral controversy before the opioid epidemic because intravenous drug use (IDU) was primarily

a concern of non-white groups with little political power.[57] However, the thought that NEPs are bad public policy is beginning to change in rural America because the opioid epidemic now affects white middle-class Americans in record numbers.[57] Further, the rates of blood-borne infections have finally brought the issue to the forefront of political thought.[57] One such example in Showalter's research was particularly poignant. Mike Pence was a staunch supporter of banning federal funding for NEPs until his home state Indiana experienced a public health nightmare with an exponential increase in HIV cases. After fully considering the science and morality, Pence declared a public health emergency and allowed NEP programs. The HIV infections stopped within months of action.[58]

As early as the mid1990s, there was morality research on NEPs. Some ideas were as follows: the risk of HIV would cause intravenous drug use (IDU) to stop, NEPs would increase drug use, and abstinence programs are more effective. None of those concerns have held up over time. HIV does not appear to be a significant barrier to IDU NEPs do not appear to increase drug use, and most NEPs have referral services for those that wish to stop using.[59]

From an academic perspective, three main issues can be offered that NEPs encourage drug use (1) by offering free injection products, (2) by creating a safe space for users leads to networking and reduced stigma, (3) if a NEP program is opened in one community it could attract the users from bordering communities and create a crime problem in the area.[58] Finally, the main issue that the other three variables attempt to measure is whether NEPs increase IDU.[58] It can be accepted that free needle exchange programs lower the cost of IDU because users do not have to procure or reuse injection equipment. There is no doubt that users of drugs would have an opportunity to network at exchange programs; however, a well-equipped program would have access to resources to help those seeking to stop. These programs are particularly relevant

in rural West Virginia, where it is little to no exposure to programs that would help an IDU. Finally, one of the most significant issues is the perceived increase in crime at the location of the NEP and the possibility of discarded hypodermic needles in public locales.

It is undisputed that NEPs reduce the amount of harm caused by IDU. Also, it has been shown that the shorter the time injection drug equipment is in rotation, the less likely individuals are to share their syringes, reducing the risk of blood-borne disease. Lastly, NEPs reduce drug use and get more users into treatment.

Study Limitation

Limitations are in every literature review due to the restrictions in the search strategy, the number of databases accessed, and publication and researchers bias cannot be ruled out.

Practical Implications

A practical implication for a needle exchange program is to reduce the number of transmitted diseases, which involves the participation of the different programs in West Virginia and drug users who utilize the programs. Providing new, sterile syringes to persons who inject illicit drugs is one of the most effective ways to prevent disease transmission in the community. However, because needle exchange programs are new, further research is needed, particularly a meta-analysis, to determine the full effect these programs have on lowering the rate of disease spread.

Although our examination was limited to West Virginia, and the state has been identified as unique, others are in its situation. States in the Appalachian region all experience poverty, addiction, and unemployment at a higher rate than the rest of the U.S. West Virginia is the only state entirely in Appalachia, so other states have more urban areas. However, the findings of studies

identified in this study in West Virginia are applicable across all states experiencing similar situations.

CONCLUSION

Based on studies conducted on the past implementation of needle exchange programs, it is suggested that there has been evidence that closing these programs can have a broad societal impact with the increased spread of HIV and Hepatitis C. There has been evidence that these programs are helpful in the reduction of the spread of these viral diseases withing injection drug users, along with healthcare cost savings.

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Take care

Alberto Coustasse- Hencke. Dr.PH. M.D., MBA, MPH
Professor
Healthcare Administration Program
Management and Healthcare Administration Division
Lewis College of Business
Marshall University
Tel: 304-746-1968
Fax: 304-746-2063
coustassehen@marshall.edu

100 E. Peyton Drive, South Charleston, WV, 25303
Publications: https://works.bepress.com/alberto_coustasse/
Website: https://www.marshall.edu/cob/profile/alberto-coustasse/