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COMMENTARY

Tackling the Rural Opioid Crisis in the United States (U.S): Strategies for Comprehensive Intervention and Resilience Building

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Abstract

The opioid crisis remains a significant public health concern in the United States (U.S.), as the nation is currently facing the fourth wave of the opioid crisis characterized by poly drug use involving opioids and psychostimulants. Rural areas of the U.S. act as risk environments for the ongoing opioid epidemic. In this paper, we explored the impact of multiple factors fueling illicit drug use in rural areas of the U.S. Sociostructural factors such as poverty, stigma and unemployment are prevalent. Remoteness and a strong social network shape the risk of drug use. Compared to the urban communities, there is greater polysubstance use, suboptimal access to harm reduction and treatment services, fewer healthcare providers, a higher population of people who use drugs (PWID), correspondingly lower coverage of needle and syringe exchange programmes (NSPs), and a higher burden of blood-borne infections. These challenges impede national strategies to combat the crisis. It is therefore recommended that harm reduction and treatment services be integrated into existing healthcare services to facilitate easy access to drug treatment services. To address healthcare delivery barriers, telemedicine platforms can be utilized for remote consultations and electronic health records to streamline information sharing. There is a need to enact legislation to expand the provider workforce. Community engagement should be prioritized, and local drug surveillance needs to be enhanced. It is opined that these strategies could create a unified and holistic response, fostering resilience and recovery in addressing the ongoing opioid crisis in rural areas of the U.S.

Introduction

Globally, drug use remains a significant public health challenge [1]. In 2021, approximately 5.8% (296 million people) of the world population used at least one drug, among which more than 60 million people used opioids, usually illicit and prescription opioids [1]. Mortality could result from an opioid overdose due to its impact on brain parts that regulate breathing. Notably, more than 100,000 people die annually of opioid overdoses [2]. Of the 600,000 deaths attributed to drug use in 2019, 80% were related to opioids, and about 25% of these deaths were caused by opioid overdoses [3].

In the United States (U.S.), the opioid crisis, characterized by an epidemic of prescription opioids and the emergence of highly potent synthetic fentanyl (an opioid analgesic that is 50-100 times more potent than heroin or morphine) in the illicit drug market, continues to contribute to drug overdose mortality in the U.S. [2,4]. In 2017, more than 47,000 lives were lost to opioid overdose [5], reflecting a 345% increase in the overdose fatality rate between 2001 and 2016 [6]. By 2019, drug overdose deaths had surpassed 70,630, with opioid-related death rates reaching 15.8 deaths per 100,000 people [2]. The urgency of addressing this epidemic is further underscored by the fact that over 75% of the 107,000 drug overdose deaths in 2021 involved opioids [7], thereby highlighting the need for immediate intervention to mitigate the devastating consequences of the opioid epidemic.

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The waves of opioid crisis in the U.S.

Historically, the U.S. has witnessed three distinct waves of opioid overdose death epidemics: The first wave linked to prescription opioids in the late 1990s, followed by heroin around 2010, and the subsequent wave involving synthetic opioids, particularly fentanyl, which emerged in 2013 [8-11].

Polydrug use, particularly involving opioids, has long been associated with drug overdose deaths [12]. Recent evidence indicates the U.S. is now facing a fourth wave of the opioid crisis, tagged as a "psychostimulant/ opioid epidemic," which reflects the prevalent use of either or both substances [13,14]. The co-use of psychostimulants and opioids is on the rise in the U.S. [14], with methamphetamine, in particular, driving a substantial increase in deaths, up by nearly 50% since 2019 [15,16]. There has been a five-fold increase in psychostimulant-related mortality, mainly attributed to methamphetamine, from 2012 to 2018 (from 0.8 to 3.9 per 100,000) [17].

The use of opioid in isolation presents distinct challenges, and the addition of methamphetamine further complicates the clinical situation [18]. Methamphetamine use has come with a range of consequences, including neurological deficits, cardiovascular symptoms, stroke, suicidal ideation, psychosis, increased hostility and violence, as well as increased sexual excitement [19,20]. Research indicates that individuals who co-use opioids and psychostimulants experience more adverse effects compared to those using either substance alone [19]. Individuals concurrently using opioids and methamphetamine, in comparison to those solely using opioids, exhibit greater injection drug use, a broader spectrum of substances consumed, more severe mental illness, riskier drug use, including a preference for fentanyl, less stable housing, a higher likelihood of unemployment, increased chronic morbidities, higher rates of blood-borne virus infections, and poorer outcomes in drug treatment (such as retention) [20-24]. Thus, urgent and sustainable approaches are needed to address this complex public health issue.

Rural areas as risk environment for the U.S. opioid epidemic

Identifying the geographical patterns of opioid overdose deaths is crucial for developing strategies to enhance opioid use treatment and effectively address the ongoing opioid crisis [25]. Globally, the opioid crisis exhibits some evolving dynamics. Opioid overdose mortality and related harm are spreading fast into rural areas across several continents [26-28]. In the U.S., the waves of the opioid crisis have impacted a more rural population compared to prior opioid epidemics [29]. Over the last two decades in the U.S., opioid overdose deaths increased by over 400 percent, reaching 45,838 in 2016, and growing faster in rural counties across all regions, particularly in the Northeast and Midwest [30]. Mortality resulting from nonmedical prescription opioid misuse is concentrated in states with large rural populations, such as Kentucky, West Virginia, Alaska, and Oklahoma [31]. Drug-related deaths involving opioid analgesics are higher in these rural areas [32]. Also, rural populations are on average older than urban populations; thus, there may be more chronic pain for which management with opioid analgesics is indicated [33].

Patterns of polysubstance use differ between rural and urban areas [34]. There is greater use of methamphetamine in rural areas compared to their urban counterparts [35]. Although contingency management approaches have demonstrated efficacy [36], their scalability remains limited in rural areas [37,38]. Moreover, in rural areas, methamphetamine treatment strategies are limited and constrained, which explains, in part, difficulties with treatment engagement (such as uptake and retention) [39].

There is suboptimal access to harm reduction and treatment services in rural areas of the U.S. [40,41]. Medication for the treatment of opioid use disorders is the gold standard for patients with opioid use disorder (OUD) [42]. These medications include opioid agonist therapy (OAT) (methadone and buprenorphine) and antagonists (naloxone) and are all associated with lower all-cause and opioid-related mortality [43,44]. The U.S. government has made provision for opioid overdose education, increased naloxone distribution, and the implementation and expansion of medication-assisted treatment (MAT) programs to treat OUD [34]. However, people in rural and remote communities experience greater difficulty accessing OAT [45,46]. There are longer travel distances to healthcare services and a 6.3 times longer average travel time to methadone programs compared to urban areas (49.1 minutes vs. 7.8 minutes) [47].

Healthcare providers appear relatively fewer compared to urban areas [48]. About 56 percent of rural counties do not have a provider who can prescribe buprenorphine [49]. Only 30 percent of people living in rural areas are without access to a buprenorphine provider, compared with 2 percent of urban residents [50]. Waivered Buprenorphine and Naloxone providers are also fewer than elsewhere, despite recent increases in the total number of waivered physicians [51,52]. The remoteness of sparsely populated rural areas hinders the availability of drug treatment services, with harm reduction services offered less frequently and situated far from individuals in need [53].

The opioid epidemic has also fueled outbreaks of blood-borne infections (such as immunodeficiency virus (HIV) and hepatitis C virus (HCV)) among people who inject drugs (PWID) in rural areas of the U.S. [54,55].

Sharing an infected needle and syringe is a primary driver of HIV and hepatitis C (HCV) transmission (PWID) [56]. The higher burden of blood-borne infections in rural areas relative to urban communities has been linked to a rise in injection opioid use and insufficient access to harm reduction services [57,58]. New acute HCV infections rose by more than 400% between 2010 and 2020, with about 66700 infections in 2020, mainly attributed to increased use of injection administration drugs [59]. The highest incidences occurred mostly in rural areas of the central Appalachia region (Kentucky, Tennessee, Virginia and West Virginia) [60]. Between 2015 and 2019, seven HIV outbreaks were identified among PWID in the U.S. [61]. Needle and syringe exchange programmes (NSPs) reduce HIV and potentially HCV transmission, especially among high-risk drug users such as PWID [62,63]. NSPs programs have been developed and implemented in the U.S. [64,65], yet there is inconsistent coverage that creates inequities in access for PWID in rural areas of the U.S., thereby posing a risk to the effectiveness of NSPS in mitigating drug-related harm [66].

Rural areas of the US also exhibit some unique features that collectively impact effective opioid crisis management [13]. Sociostructural factors such as poverty, unemployment, stigma, and homelessness, among others and the geographical context, shape the risk of drug use in rural areas [67,68]. Stress resulting from economic deprivation creates a stressful environment that places individuals in rural areas at risk for drug use compared with their urban counterparts [69]. Rural counties have faced job sector and industry shifts, resulting in high rates of unemployment and fewer opportunities for establishing a long-term career with the potential for upward mobility [70]. In rural areas, there are broadband limitations, which hinder the opportunity to take advantage of the recent expansion of telehealth services [71].

Furthermore, evidence has revealed a link between strong social and kinship networks and illicit drug use [72]. Individuals in rural areas engage more closely and longer with their social network and others who are geographically closer than their urban counterparts [73,74]. This strong social network allows faster diffusion of prescription opioids among those at risk of illicit drug use, as well as sources of prescription opioids through families [70]. Thus highlighting a vital roadmap for addressing the dissemination of prescription opioids in rural settings.

Despite several ongoing efforts in the U.S. to combat the opioid crisis, opioid overdose mortality continues to rise, with rural areas experiencing higher rates than urban areas [29]. Challenges in rural areas impede service access, amplify gaps and hinder the effectiveness of national strategies. People residing in rural areas of the U.S. face multifaceted health and social needs that can significantly affect their drug use behaviours. Hence, to tackle the opioid epidemic, particularly in rural areas of the U.S., it is vital to prioritize the interrelated factors influencing the crisis and devise comprehensive interventions.

Recommendations

Integration of healthcare services

The availability of and easy accessibility of harm reduction and other treatment services that rural communities need must be enhanced to strengthen the fight against the opioid epidemic in rural areas of the U.S. [75]. Stigma poses a widespread challenge and can serve as a barrier to providing drug treatment services in resource-poor settings [76]. The primary care setting is characterised by a welcoming, nonjudgmental, respectful, and empathetic atmosphere [77]. Harm reduction and treatment services can be integrated into the mainstream healthcare system [78]. An integrated “one-stop shop” model may be employed to offer buprenorphine, naloxone, mental health counselling, HIV and hepatitis C treatment, and needle and syringe exchange in an existing healthcare facility. In addition to overcoming barriers to care for people who use drugs, patients may receive additional support, including access to clothing, food, job opportunities, and assistance with easy enrollment in health insurance and disability pension support for those with disabilities [79]. This approach may not only curb the opioid crisis in rural areas but also address the socioeconomic factors that contribute to and aggravate the consequences of drug use.

Leveraging technology to address healthcare delivery barriers

Healthcare professionals face some barriers, including geographical, information sharing, and decision-making support, among others, to rendering drug treatment services in rural areas [80]. For instance, the prescription of buprenorphine is constrained by time and a lack of mental health or psychosocial support services for patients in remote locations [81]. Treatment models that use technology to address these barriers have been shown to increase access to and treatment outcomes for harm reduction services in rural populations [82,83]. Implementing and utilising digital solutions can help overcome geographical barriers, improve collaboration among healthcare providers, and provide efficient resources for managing opioid-related cases. This may include telemedicine platforms for remote consultations, electronic health records for streamlined information sharing, and decision-support tools to assist physicians in evidence-based treatment approaches. However, the implementation of technology may encounter challenges, particularly related to broadband availability [71].

Legislation to expand provider workforce

Legislative initiatives could help address workforce shortages and enhance accessibility to opioid treatment services in rural areas of the U.S. [84]. This could include policies incentivizing healthcare professionals to work in underserved regions through loan forgiveness programs and targeted funding for training programs in addiction medicine [85]. Legislative efforts may also focus on streamlining licensing processes to facilitate the deployment of qualified providers to rural areas. Also, lasting partnerships between academic institutions and healthcare organizations can be fostered to promote training programs tailored to the specific needs of rural communities. Legislative action could build a robust and accessible healthcare workforce capable of delivering effective drug treatment services in rural settings.

Community engagement and awareness creation

Engaging communities is pivotal in addressing the opioid crisis in rural areas of the U.S. Community engagement involves collaboratively involving local residents, leaders, and organizations in developing and implementing tailored strategies [86]. This approach helps identify unique challenges and community-specific solutions to the challenges of the opioid crisis. In rural settings, where close-knit communities often play a significant role in shaping individual drug use behaviour, this collaborative approach will create a locally relevant response to the opioid crisis. It will also contribute to individual understanding of how stigma, discrimination and inequities prevent access to prevention, treatment and recovery services. Collaboration between healthcare providers, law enforcement, and community organizations needs to be enhanced to create a unified front against the crisis. Additionally, there is a need to implement community-based education programs using culturally-adaptive mediums to raise awareness about the dangers of opioid misuse and foster a supportive environment.

Enhance local drug surveillance

Drug surveillance remains a critical tool in addressing the opioid crisis in rural areas of the U.S. [87]. Through systematic monitoring of prescription patterns, early detection of emerging trends, and mapping geographic hotspots, surveillance will enable local authorities in the U.S. to effectively utilize data [88]. This will ensure an understanding of the evolving dynamics of opioids in circulation, especially how frequently fentanyl, heroine and other illicit opioids and methamphetamine are changing and interrupting their supplies. The real-time data monitoring will inform decision-making, allowing for timely resource deployment and law enforcement strategies to combat illicit drug trafficking.

Conclusion

To effectively combat the opioid epidemic in rural areas of the U.S., it is essential to recognize the impact of several unique features of rural areas in fueling illicit drug use. The recommended strategies provide a roadmap for comprehensive interventions, ranging from integrated healthcare services to community engagement and awareness creation, the use of innovative technologies to address healthcare delivery barriers, and legislation that expands providers' workforce. Furthermore, it emphasizes the need to enhance local drug surveillance as a critical tool local authorities could leverage to stay ahead of emerging trends and proactively respond to the illicit drug supply and utilization in the community. By implementing these recommendations, a unified and holistic response can be forged, fostering resilience and recovery in the face of the ongoing opioid crisis in rural areas of the U.S.

Role of Authors

RKO, and MOO conceptualized and drafted the first and subsequent versions of this article. Both authors read, revised the drafts and approved the final manuscript.

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