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Rural Emergency Medical Service Providers Perceptions on the Causes of and Solutions to the Opioid Crisis: A Qualitative Assessment

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Abstract

Introduction: The continuing opioid crisis poses unique challenges to remote and often under-resourced rural communities. Emergency medical service (EMS) providers serve a critical role in responding to opioid overdose for individuals living in rural or remote areas who experience opioid overdoses. They are often first at the scene of an overdose and are sometimes the only health care provider in contact with an overdose patient who either did not survive or refused additional care. As such, EMS providers have valuable perspectives to share on the causes and consequences of the opioid crisis in rural communities. **Methods:** EMS providers attending a statewide EMS conference serving those from greater Minnesota and surrounding states were invited to take a 2-question survey asking them to reflect upon what they believed to be the causes of the opioid crisis and what they saw as the solutions to the opioid crisis. Results were coded and categorized using a Consensual Qualitative Research approach. **Results:** EMS providers' perceptions on causes of the opioid crisis were categorized into 5 main domains: overprescribing, ease of access, socioeconomic vulnerability, mental health concerns, and lack of resources and education. Responses focused on solutions to address the opioid crisis were categorized into 5 main domains: need for increased education, enhanced opioid oversight, increased access to treatment programs, alternative therapies for pain management, and addressing socioeconomic vulnerabilities. **Conclusion:** Along with the recognition that the opioid crisis was at least partially caused by overprescribing, rural EMS providers who participated in this study recognized the critical role of social determinants of health in perpetuating opioid-related harm. Participants in this study reported that education and increased access to treatment facilities and appropriate pain management, along with recognition of the role of social determinants of health in opioid dependency, were necessary steps to address the opioid crisis.

Keywords

emergency medicine services, rural health, medications, qualitative methods, opioids

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Introduction

The rising incidence of opioid misuse and overdose has become a serious public health issue in the United States (US). The Centers for Disease Control and Prevention (CDC) noted that over 700 000 deaths resulted from drug overdose in the US during 1999 to 2017, with 56.8% involving opioids.[1] Further increases in overdose related deaths have been seen during the COVID pandemic with overdose-related cardiac arrests totaling 49.5 per 100 000 EMS activations (48.5% above baseline) in 1 study.[2]

Studies have shown that rural US populations suffer disproportionately from the opioid crisis.[3,4] This phenomenon is worsened by limited access to treatment facilities[5-7] and overprescribing of opioids in rural communities.[8] Additionally, social determinants of health—including concepts such as economic distress and social isolation—play a significant role in addiction and opioid-related disparities in rural

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communities.[9-12] Similarly, in Minnesota, many isolated rural communities lack the treatment and recovery resources available to their metropolitan and suburban counterparts. Rural Minnesota counties experience greater poverty, unemployment, and overdose death rates than their respective state averages.[13-15]

As the opioid epidemic in the rural US escalates, a frontline view of the opioid crisis from the perspective of rural Emergency Medical Services (EMS) is critical. The majority of published studies examining the role of EMS in the opioid crisis have explored EMS use of the drug naloxone, an opioid antagonist used to rapidly reverse opioid overdose.[16-18] These studies explored the effectiveness of various naloxone administration routes used by EMS[19-21] as well as demographics of patients receiving naloxone by EMS in the field.[22,23]

Some studies explore expanding the role of EMS providers in serving patients at risk of opioid overdose. One qualitative study conducted with Baltimore EMS providers recognized that, given their direct contact during transport, they are in a unique position to intervene and provide needed care for patients with substance use disorders (SUD).[24] Additionally, EMS has an important role in conducting real-time surveillance for detecting and tracking opioid use and number of overdose patients.[25] Studies have used EMS surveillance data to identify the trends of opioid overdose, deaths, and use of naloxone in the field to inform public health response.[26,27]

The clear majority of published literature has examined the role of EMS in opioid overdoses in urban US communities, with several published studies focusing specifically on rural communities. One study observed rural Emergency Medical Technicians (EMTs) knowledge of naloxone improved significantly after training.[28] Another study demonstrated that rural communities are disproportionately affected by underutilization of naloxone; the study noted that only 20% of total EMS personnel cover rural environments, which constitute 80% of the US land mass.[29]

Although research has shown that the opioid overdose mortality rate is 45% higher in rural communities than in the urban environment, the odds of rural naloxone use by EMS increased only 22.5% compared to urban naloxone use.[30] Most EMS personnel in rural areas have received only EMT-Basic (EMT-B) training, and are not able to administer naloxone to treat opioid overdose by protocol as a part of their professional role. They can assist in managing airway and transport to the hospital, but this is not adequate treatment for longer transport times. Therefore, fewer EMT-Paramedics (EMT-P) and EMT-Intermediates (EMT-I) available in rural areas may contribute to health care disparity and public health burden for opioid overdose.[30]

Despite rural US communities suffering a disproportionate burden from opioid overdose, and EMS providers serving as the first health professionals responding to an opioid overdose, there is a gap in the literature regarding rural EMS provider reflections on the impact of the opioid crisis. The purpose of this study was to examine rural EMS provider perceptions on the causes of and solutions to the opioid crisis. While the causes of the crisis were likely outside the realm of EMS, their perceptions are critical to design appropriate approaches for the medical and public health communities to address the needs of patients with substance abuse.

Methods

Study Population and Design

This study utilized a convenience sampling approach to engage EMS provider participants in attendance at an opioid-focused session at the Arrowhead EMS Association Conference in 2018 and 2019. This statewide annual conference, held in Duluth, Minnesota, attracted 574 attendees in 2018 and 562 attendees in 2019. Attendees included EMS providers from Minnesota, Wisconsin, Iowa, Michigan, and Ontario. Of the attendees, 85% in 2018 and 84% in 2019 self-identified as practicing in a rural area, as determined by the registrants' information and the population data provided by the 2010 Census Bureau.[31] Definitions of rural and urban areas utilized within this study are adapted from the U.S. Health and Human Services, which defines urban areas as cities which encompass a population of at least 50 000 people, with rural status designated for areas with a population of less than 50 000 people.[32] Attendees self-reported their professions and for both 2018 and 2019, EMTs made up the largest contingency at 47% and 37% respectively. Other self-reported professions represented included emergency medical responders, paramedics, nurses, firefighters, dispatch, EMS management, search and rescue, and law enforcement.

In both 2018 and 2019, the conference offered an opioid-focused technical assistance session taught by University of Minnesota College of Pharmacy pharmacist faculty members. During these continuing education sessions, all session attendees were invited to anonymously answer 2 open-ended, open text reflective questions on a paper handout collected as they left the session. One question asked survey participants what they perceived as causes of the current opioid epidemic; the other question asked what the participants perceived as solutions to the current opioid epidemic. Participants were encouraged to note any other observations or comments regarding the opioid crisis in their reflection.

Data Collection and Analysis

There were a total of 123 surveys completed, 90 in 2018 and 33 in 2019. The qualitative data from these reflections, originally handwritten, were transcribed and further analyzed using the principles of Consensual Qualitative Research (CQR).[33] CQR is an inductive method that is well-suited to

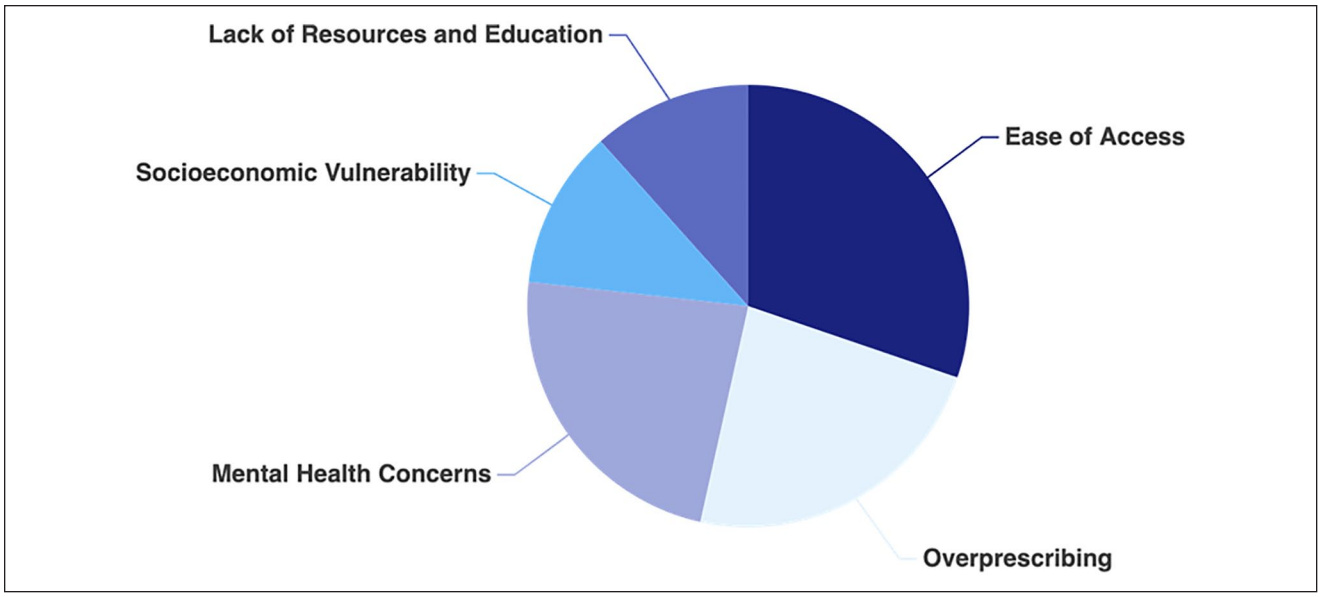

Figure 1. EMS perceived causes of the opioid epidemic.

research that explores attitudes and convictions; coding involves consensus of the research team and incorporates context and multiple viewpoints.[33]

In this process, initial domain themes were independently identified by the 2 student researchers. Domain names were then cross-analyzed between the 2 researchers and were then used as the first iteration list for the next step in code mapping.[34] The code list was updated after consultation with a faculty auditor. Descriptions of domain themes were created and coding subdivisions were identified for the second round of coding. During the second team meeting, consensus was reached and the coders discussed what codes might be combined, noting that some domains were not well represented in the final table. The domain definitions for the causes of the opioid crisis and proposed solutions can be found in Supplemental Appendices A and B, respectively. Throughout the process, coding was reviewed and arbitrated by an auditor, the senior author, who is a faculty member knowledgeable about CQR and the impact of the opioid crisis in rural Minnesota. Due to participant anonymity, this study was designated as "not human research" by the University of Minnesota Institutional Review Board.

Results

The vast majority of attendees at the opioid-focused sessions in 2018 and 2019 self-identified as practicing in a rural and under-served communities, although zip code data for this subset of conference attendees was not obtained. EMS providers' perspectives on the causes and consequences of the opioid crisis in rural Minnesota center on both biomedical and social causative factors of the opioid crisis and the complexities of interactions between these factors.

Causes of the Opioid Crisis

Five domains summarized participant perceived causes of the current opioid epidemic including: overprescribing, easily accessible substances, socioeconomic status, uncontrolled mental health, and lack of resources and education (Figure 1). Representative quotes for each major theme are summarized in Table 1.

Solutions to the Opioid Crisis

Five domains were created to summarize participant perceived solutions of the current opioid epidemic in rural Minnesota. These include the need for increased education, enhanced opioid oversight, increased access to treatment programs, alternative therapies for pain management, and the need to address socioeconomic vulnerabilities (Figure 2). Table 2 contains representative quotes for the 5 domains. An overwhelming majority of the responses from EMS respondents reflected the need for multi-pronged approaches, stating that the solution should be a combination of increased education, access to treatment programs and mental health services, and increased monitoring of opioid use and prescribing practices.

Discussion

The solutions proposed by rural EMS providers included increased education, enhanced opioid oversight, increased access to treatment programs, alternative therapies for pain management, and addressing socioeconomic vulnerabilities. These solutions are very closely linked to what these providers reported as the causes of the opioid crisis, including overprescribing, ease of access to opioids, socioeconomic

Table 1. EMS Perceived Causes of the Opioid Crisis.

Domain name	Sample quotes
Overprescribing	"Over prescription without class monitoring with care provider" "Doctors over ordering pain meds rather than other options"
Ease of access	"Ease of drugs coming over the southern border. Not saying we need a wall." "Availability from out of county or out of state sources" "I think the problem is that drugs are easy to come by" "Opioids are easier to get, they are everywhere I live" "Easy access to scripts from medical/doctors; leftovers sitting around the home"
Socioeconomic vulnerability	"Poverty" "Unemployment" "I think the cause of opioid addiction is the general break down of family and social structure of society" "Hopelessness; working for nothing (no way for me to rise up); society think[s] I don't matter"
Mental health concerns	"Lack of known purpose/direction in life, for long list of reasons; people want to numb their pain" "Mental health that isn't treated" "I feel opioid use—as any drug use—is an attempt to escape from life"
Lack of alternative therapies/ treatment options	"Lack of alternative pain management" "I think the problem is lack of help for those with problems with drugs. also a lot of people think "hey they have Narcan, we can go past our limit" "Over prescription of pain medications at first then when that was reigned in those people were left to find something else to use" "Doctors no longer prescribing as many opioid painkillers. prescription pill addicts discovering street drugs that give the same/similar effects as the medications they can no longer obtain"

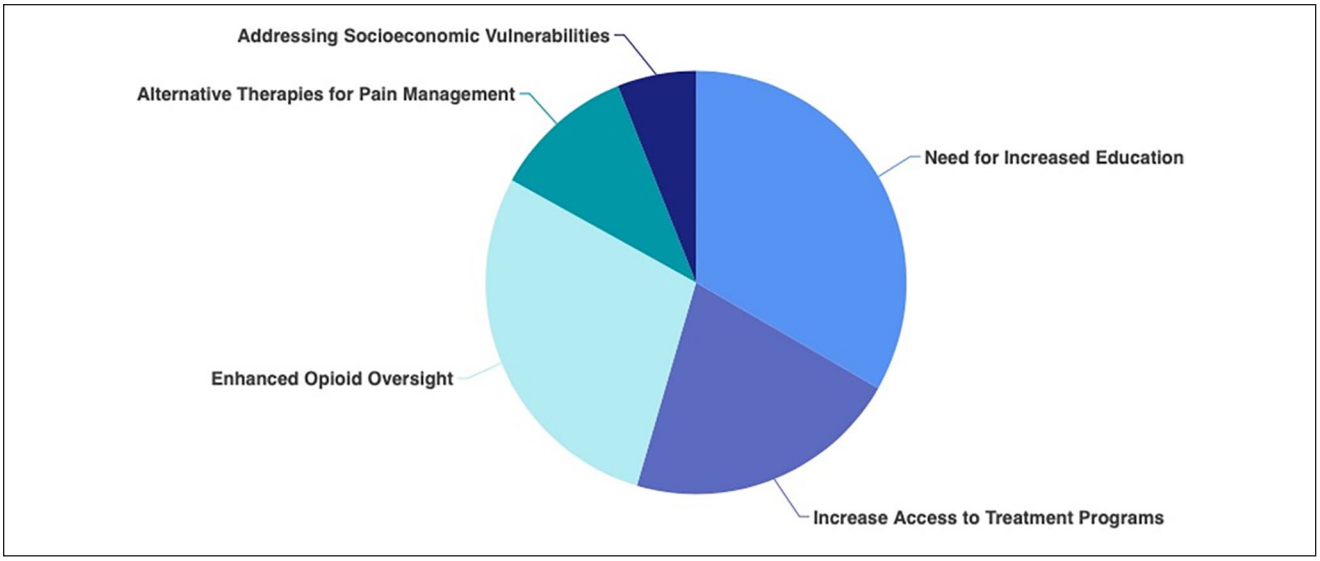

Figure 2. EMS perceived solutions to the opioid crisis.

vulnerability, mental health concerns, and lack of resources and education.

The need for health care provider education on appropriate prescribing of opioids has been well-recognized. National organizations including the Substance Abuse and Mental Health Services Administration, the United States Department of Health and Human Services, and the Institute for Healthcare Improvement have recognized and sought to meet this need by offering online resources to support safe opioid prescribing.[35-37]

Table 2. EMS Perceived Solutions of the Opioid Crisis.

Domain name	Sample quotes
Need for increased provider and community education	"More education on risks, challenges of opioids" "To help the epidemic, there needs to be more awareness. There also needs to be some form of help for people who are on them to slowly taper off. They get sent home and no instructions on how to deal with them. They are so addicting and you don't realize it 'til you are on them"' "[Increase] opioid overdose awareness and Narcan use in our community and outside communities"
Enhanced opioid oversight	"Stricter rules when patients receive their pain meds; follow up with patients to ensure they are not 'over using"' "Less medication being prescribed; closer monitoring of controlled substances by doctors (actually looking at the website)" "Don't make them so easy to get" "Fewer prescriptions/limited prescriptions" "Ever changing legislation and harsher sentences for those involved in illegal use"
Increased access to treatment programs	"More facilities to be open to help these people out; more resources for the people providing care to these people who overdose" "More resources for mental health, poverty, addiction" "Better mental health care" "Easier access to detox/treatment" ". . .treatment/addiction recovery and readily available med waste disposal programs" "Some solutions could be additional resources (rehab facilities, drug prevention services, etc.) for early addiction issues, to help with rehab/recovery and continuing care"
Alternative therapies for pain management	"Alternate methods of pain management; preventive solutions" "Some solutions could be additional resources (rehab facilities, drug prevention services, etc.) for early addiction issues, to help with rehab/recovery and continuing care" "Different ways to treat problems/pain other than prescribing opioids" "Hopefully find other alternatives. If less opioids/narcotics are prescribed/available to users hopefully the number of overdoses would decrease" "Give different drugs to do the job when treating the patient"
Addressing socioeconomic vulnerabilities	"Better transportation to/from activities clubs; higher wage for families so they don't need 3 to 4 jobs—get parents more available" "More local activities to keep kids out of trouble" "Affordable and respectable housing, real food for our health, respect, and value all people" "Improving moral values and self-esteem, family crisis intervention" "Connecting addicts with people/community/programs that can help"

EMS providers surveyed reported a perceived accessibility of opioids and other substances of abuse, which they believed contributed to the current opioid crisis. Opioids are available from a variety of locations and situations, including prescriptions written to a patient, unused prescriptions shared with family and friends, unused or diverted prescriptions sold on the street, counterfeit prescriptions manufactured at pill mills, and heroin and other illicit substances.[38] Research conducted by Kennedy-Hendricks et al[39] revealed that about 1 in 5 adults with an opioid prescription self-reported having shared those opioids with another person, most frequently to help manage pain.[39] It has been recognized that "in the absence of a care network to address and help with addiction rehabilitation, patients who are addicted are driven to find new sources of opioids, including cheaper, and more readily-available, black market sources of opioids of unknown quality and strength, thus leading to frequent accidental overdose."[40]

While attention to and accountability in opioid prescribing show promise in decreasing the accessibility of opioids in the community and rates of opioid dependence, education on the dangers of sharing or selling unused prescriptions, and increased availability of medication take-back

events and drop-boxes to reduce the number of unneeded opioids in the community, may also be useful.

The United States Drug Enforcement Agency, in collaboration with other organizations, strives to reduce the supply of prescription opioids by facilitating the return of unused medications through drug take-back programs. These programs show promise in both raising awareness and in collecting substantial quantities of unwanted drugs from the community.[41,42] Permanent medication drop-boxes could assist in reducing the number of unused opioids available in the community,[43,44] and are especially important for rural communities that lack sufficient resources to host a take-back event.[44] While expansion of opioid accessibility through increased availability has served as a catalyst for overdose rate, a focus exclusively on decreasing opioid supply has been shown to reduce the effectiveness of community responses to opioid overdose.[45,46]

Participants' reports that poverty is a driver for opioid-related harm are consistent with research findings. One study revealed that regardless of whether an individual lives in an urban or rural location, elevated rates of prescription opioid overdose were found in economically disadvantaged zip codes, with economic disadvantage playing a larger role in heroin overdose rates in rural communities.[46] In a commentary entitled *Opioid Crisis: No Easy Fix to Its Social and Economic Determinants*, Dasgupta et al[47] point out that "poverty and substance use problems operate synergistically, at the extreme reinforced by psychiatric disorders and unstable housing." In many cases, the most desirable and lucrative employment in poorer communities is dominated by manufacturing and service jobs with elevated physical hazards in rural communities,[48] as well as agricultural jobs with significant risk of injury.[49] According to Dasgupta et al[47] "when sustained over years, on-the-job injuries can give rise to chronically painful conditions, potentially resulting in a downward spiral of disability and poverty." Although opioid analgesics may allow those with injuries that would otherwise be debilitating to maintain their employment, studies have shown that individuals in manual labor occupations appear to be at increased risk for non-medical use of opioids.[11]

Not surprisingly, studies have shown that counties with the lowest levels of social capital—the extent and depth of supportive social networks and trust—have the highest overdose rates.[9] Furthering the concept of social capital, increased attention to the role that "diseases of despair" play in the opioid crisis has focused on interconnected trends in fatal drug overdose, alcohol-related disease and suicide.[50] Research has also shown that adverse childhood experiences have been strongly linked to subsequent substance use with childhood trauma is associated with increased opioid use years later in life.[51]

In rural communities, a shortage of mental health facilities and providers,[52] and increased perceived stigma surrounding mental health[53,54] may compound or potentially cause individual struggles with substance use disorders. A study by Pederson et al[55] revealed that rural adults who reported having a mental health concern and who also had perceived stigma regarding mental health were more likely to be unemployed, seeking work, or not working and not seeking work, military veterans, or to have deferred medical care because of cost. These individuals were also more likely to report lacking emotional support and an established health care provider.[55]

Not surprisingly, study participants reported that a lack of education served as a perceived causative factor of the opioid crisis. They cited a major need for increased education for community members and healthcare providers alike. Regardless of audience, the perception among some that substance use disorders are a moral failure, rather than a disease state, contributes to the stigma surrounding substance use disorders.[56] Because stigma serves as a major barrier for accessing treatment, reducing stigma is critical for reducing the impact of the opioid crisis.[56] Research has also shown that negative attitudes of health professionals towards patients with substance use disorders are common and contribute to suboptimal health care for these patients.[57] For this reason, all healthcare providers, including those in EMS, may benefit from additional education and training on substance use disorder and combating the stigma surrounding it.

Survey participants identified that a lack of resources for substance use disorder treatment and harm reduction, as well as a lack of education, serve as contributing factors to the opioid crisis. Rural and remote areas present several challenges to the provision of effective prevention and treatment of opioid use disorder. According to Havens et al[58] some of these barriers "add to the usual barriers such as stigma, incorrect understanding of the role of partial and full opioid agonists in the treatment of opioid use disorder (OUD), limited access to medication-based treatments, limited supply of appropriately trained treatment providers, and others, seen in larger metropolitan regions of the country" while "the relatively low population density of rural regions exacerbates the challenges seen elsewhere."

Research has shown that when compared to urban settings, rural communities often lack options for specialty substance use disorder treatment facilities, which may discourage treatment utilization among underserved and vulnerable populations.[59,60] A study conducted by Sigmon[61] revealed that a majority of participants currently enrolled in a rural methadone clinic needed to travel at least 60 min per clinic visit, and a large portion of those participants relied on public transportation. With the lack of dedicated addiction treatment centers in rural communities, it is increasingly important to educate providers and integrate MAT within primary care. The Substance Abuse and Mental Health Services Administration's (SAMHSA) Provider Clinical Support System (PCSS) focuses on training primary care providers in the evidence-based prevention and treatment of OUD and chronic pain.[62] Successful models of integrated

primary care with MAT have been demonstrated in the United State and abroad.[63]

The results of this study give EMS providers in greater Minnesota, and surrounding areas, a new voice in the opioid crisis. While EMS providers across the country are saving lives daily with the use of naloxone and emergency care, it is time to take the next step and consider unconventional solutions including frontline EMS providers. Swayze[64] suggests that EMS, along with the healthcare system in general, move away from the standard thinking of ROSC as an acronym for Return Of Spontaneous Circulation and begin to view ROSC as seen in the rehabilitation world as Recovery-Oriented System of Care. Rather than simply treat opioid overdose by resuscitation with naloxone, there should be a comprehensive care system.[64] With more naloxone available in the community and being administered by medical laypersons, EMS has an increasing opportunity to supportively educate newly-revived patients on the importance of medical follow-up and treatment. Additional education for healthcare providers—including EMS—can begin to reduce stigma and improve the care of patients with opioid use disorder. While initial efforts in an opioid overdose will always focus on resuscitation, there are opportunities for EMS to connect with patients upon discharge, further educate patients on harm reduction strategies and assist with navigating and supporting patients in transitions to addiction treatment programs.[62]

Limitations

This study utilized a convenience sampling approach to engage a specific group of research participants at a regional EMS conference. This method of data collection has been used in other studies where a specific expertise is sought among research participants and a convenient location to engage with this group of participants has been identified.[65] The advantages to this approach include low costs, increased convenience for researchers and participants, and increased research participant engagement in a shorter period of time, as well as the assurance that research participants meet the study inclusion criteria of being EMS providers. The disadvantages of this approach include the inherent bias present when using convenience sampling; research participants were all from the same geographical area making results not necessarily generalizable to the larger EMS community. The relatively small sample size of this study and the use of a survey, which has not been validated, also contribute to the results not being generalizable to every rural community. It is unclear if the participants are a fair representation of the population attending the conference. Additionally, individuals attending an opioid-related session at a professional conference may already be more engaged in mitigating opioid-related harm than their colleagues, thus resulting in a positive response bias.

It is possible that some research participants may have identified a single issue of concern pertaining to the opioid crisis, and that their views on this single issue may have informed their responses to both questions. For example, some EMS providers may believe that overprescribing of opioids is the primary cause of the opioid crisis and that curtailing opioid prescribing is the primary solution to the opioid crisis. The CQR method is an inductive approach that involves analysis of the data as a whole, and as a result does not identify correlations between answers to various questions.

Conclusion

Despite recognition that the opioid crisis was at least partially caused by overprescribing, rural EMS providers recognized the critical role of social determinants of health in perpetuating opioid-related harm. Participants in this study reported that education and increased access to treatment facilities and appropriate pain management, along with recognition of the role of social determinants of health in opioid dependency, are necessary steps in addressing the opioid crisis in the rural setting.

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Supplemental Material

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