Narayani Dhanraj Damasco DEN 2315 Pharmacology Fall, 2018

MIDWEST #1 (North Dakota, South Dakota, Wisconsin, Minnesota, Nebraska) Regional Parameters

The misuse of legal and illegal drugs has been around for a long time, and with the release of newer and more potent drugs, came the rise in abuse and fatalities. In the nineties, dentists were the number one prescribers of opioids, accounting for over 15.5% of all prescriptions (Somerman & Volkow, 2018). Since then, dentists cut their rate of opioid prescription writing by nearly half that amount. However, the opioid crisis remains at an all-time high.

In the Midwest region that we were assigned, the state-prescribing rate of opioids for 2017 were slightly less than the national average of 58.7 per 100 persons (Center for Disease Control and Prevention, 2017). For example, state-prescribing rate of opioids for Nebraska and Wisconsin in 2017 were 56.6 and 52.6 per 100 persons, respectively (Center for Disease Control and Prevention, 2017). Comparatively, the highest state-prescribing rate for opioids was in Alabama with 107.2 per 100 persons (Center for Disease Control and Prevention, 2017). In 2016, the average rate of abuse for opioid related overdose deaths at the state level in the Midwest were also below the national rate of 13.3 deaths per 100,000 (National Institute on Drug Abuse, 2018a). Of the states in that region, only Wisconsin had a higher opioid overdose rate, 15.8 deaths per 100,000 persons, than the national rate (National Institute on Drug Abuse, 2018a). In fact, there was a 15-fold increase in opioid overdose death rate in Wisconsin from 1999 to 2016, from about 1.0 to 15.8 per 100,000 persons (National Institute on Drug Abuse, 2018a).

The primary drug of abuse in most of the Midwest states is marijuana. Also known by street names like weed, pot and grass, marijuana has various commercial brand names such as Kush, Haze and Diesel among others (Schleuss, 2014). "Marijuana is classified in the US as a Schedule I drug which, like heroin, contains substances with a high potential for abuse" and addiction (Oberbarnscheidt & Miller, 2016). According to an article published in the *Journal of Addiction Research & Therapy*, "marijuana affects the same reward systems in the brain as alcohol, cocaine and opioids ... [by] induc[ing] the release of endorphins ... [and by] act[ing] as a dopamine agonist in the brain" (Oberbarnscheidt & Miller, 2016). The brain and spinal cord are the main sites of actions for marijuana. According to Oberbarnscheidt & Miller (2016), marijuana "binds to two types of G-protein-coupled receptors, CB1 and CB2." As a result, "marijuana alters the user's perceptions and mood and disturbs memory function and learning and leads to impaired judgment" (Oberbarnscheidt & Miller, 2016).

While marijuana is not federally recognized as legal, it is legal in some states and it does not have a lethal potency. The more concerning data for the Midwest region is the continued rise in opioid deaths and abuse. Across the U.S. from 1999 to present, the drug death rate has almost quadrupled, from 16,849 opioid related deaths in 1999 to 63,632 deaths in 2016 (Hedegaard, Warner, & Miniño, 2017). According to Hedegaard et al. (2017), "the rate of drug overdose deaths involving natural and semisynthetic opioids, which include drugs such as oxycodone and hydrocodone, increased from 1.0 in 1999 to 4.4 in 2016. Hedegaard et al. (2017) also pointed out that "the rate increased on average by 13% per year from 1999 to 2009 and by 3% per year from 2009 to 2016."

In the Midwest, prescription opioids are the leading cause of deaths related to opioid overdose compare to Heroin and Synthetic Opioids. In fact, Wisconsin and Minnesota,

prescription opioids accounted for 45% and 49% of opioid overdose deaths, respectively (National Institute on Drug Abuse, 2018a; National Institute on Drug Abuse, 2018b). See Appendix A for prescription opioid related deaths. It is the misuse of prescription medications that ultimately trickle into the community and lead to the accessibility of drugs. In fact, most of the drugs that are abused originated from doctors' offices. According to a consumer protection report, "27% obtained the drugs with their own prescription, but 26% got them illegally from a friend or relative for free" (Bennett, 2017). Furthermore, "twenty-three percent bought them from a friend or relative, and 15% bought them on the street from a drug dealer" (Bennett, 2017). Based on the report, "64% of those who were abusing the drugs, were not actually prescribed the pills legally" (Bennett, 2017). Aside from prescription, those who develop an addiction to opioid tend to acquire them illegally from drug peddlers.

There is a correlation between opioid abuse and socioeconomic status. According to the CDC, "opioid-involved overdoses accounted for two thirds of drug overdose deaths, with increases across age and racial/ethnic groups, urbanization levels, and in numerous states" (Seth, School, Rudd, & Bacon, 2018). The article continues that the Midwest recorded the highest rates of psychostimulant-involved overdose deaths (Seth et al., 2018). There is a clear correlation between opioid abuse and people in poor regions. As the National Institute on Drug Abuse states, "people on Medicaid are more likely to be prescribed opioids, at higher doses, and for longer durations—increasing their risk for addiction and its associated consequences" (National Institute on Drug Abuse, 2017).

Although a correlation exists between poverty and opioid abuse, addiction to opioids like heroin affect people regardless of socioeconomic factors such as income, education or employment. According to an article published by Sunrise House- an American Addiction

Center, "the CDC reports that the greatest increase in heroin use since 2002 has occurred among demographic groups that have had traditionally low levels of use, including women, Americans with higher incomes, and people who have health insurance coverage" ("Addiction within Demographics", n.d.). The article also states that "a comparison of figures from 2002 to 2013 from the CDC shows that heroin use increased the most in Americans with an average household income of \$20,000-\$49,000 (an increase of 77 percent), while the increase in use in Americans with an income over \$50,000 and in those with an income of \$20,000 or less was very similar (60 percent versus 62 percent)" ("Addiction within Demographics," n.d.).

Furthermore, deaths resulting from opioid overdose in the Midwest are concentrated in white, non-Hispanic males between the ages of 25-34 demographic (Kaiser Family Foundation, 2016a; Kaiser Family Foundation, 2016b). Based on the data presented in the Kaiser Family Foundation (2016b) report, white, non-Hispanic accounted for 83% and 78% of opioid overdose deaths in Wisconsin and Minnesota, respectively. Furthermore, the 25-34 age range accounted for 28% and 27% of opioid overdose deaths in Minnesota and Wisconsin, respectively (Kaiser Family Foundation, 2016a). This was the highest in comparison to the other age group in the report.

Each state has incorporated their own strategies for dealing with the opioid crisis. Wisconsin has been given a grant focusing on reducing the nonmedical or unauthorized availability prescription opioids, as well as preventing opioid-related overdose deaths (Wisconsin Department of Health Services, 2018). North Dakota has a program called "Lock. Monitor. Take Back," with the primary goal of reducing access to prescription drugs (North Dakota Prevention Resource & Media Center, 2018). Minnesota was chosen to participate in the NGA prescription drug abuse academy (Minnesota Department of Health, n.d.). While Nebraska is working proactively to combat their crisis by utilizing the "The Prescription Drug Monitoring Program" as well as passing a mandatory reporting law (Gage & Naughton, 2016). South Dakota developed South Dakota's Statewide Targeted Response to the Opioid Crisis in 2017 (South Dakota Departments of Health and Social Services, n.d.). There are also many counties that are opening triage centers as an initial point for those with both mental health and/or substance abuse issues. In Minnehaha County, South Dakota, local hospitals, law enforcement and mental health care providers are all working together to assemble a drop site so people can go to seek necessary treatment (Ammesmaki, 2018).

Impact Story

One major benefit the media has on opioid crisis is that it helps bring the issue of substance abuse to the front. Television and social media gives us the power to share important information about drug abuse in our community and across the country. Two recent news report from the Midwest shows the destructive and detrimental magnitudes of substance abuse in our country today. In the first article titled, "ND bartender accused of providing heroin that caused an overdose," Herald (2018) reported that a bartender from Tioga, North Dakota was accused of selling heroin which resulted in a deadly overdose (see Appendix B for news article). Daniel Slaven, a 43-year-old man, purchased heroin from bartender, Piper Bjornsen, a 29-year-old woman. Slaven then returned home and injected the heroin. Later that day, police and EMT were dispatched to his home and Slaven was pronounced dead at the medical center. Bjornsen have a preliminary hearing scheduled for December 13, 2018. In the second article titled, "Man pleads guilty in SD's largest heroin, fentanyl bust," Nelson (2018) reported that a man pleaded guilty to what is alleged to be the biggest heroin and fentanyl raid in South Dakota's history (see Appendix C for news article). Andy Ontiveros was arrested in Minnehaha County, South Dakota

after officers "found 2,680 grams (5.9 pounds) of heroin and 993 grams (2.2 pounds) of fentanyl hidden inside" his vehicle (Nelson, 2018). Ontiveros will be sentenced in federal count on January 14, 2019. According to Nelson (2018), Ontiveros felony has a minimum sentence of 10 years to maximum of life in federal prison and/or a hefty fine of \$10 million.

The aftermath of these events affected everyone from those directly involved in the incident to family and community members. In Daniel's case, he lost his life as a result of using heroin. He is survived by his fiancé, three children, four siblings and his parents among many other family members and longtime friends (Haakenson, 2018). The impact of this tragic event is limited to those who knew Daniel. The event that Nelson reported in her article could have resulted in deadly impact of immense proportions had Ontiveros not been caught. It would have made it that much easier for teens and adults to have access to heroin and fentanyl. What does possession with intent to distribute 993 grams (2.2 pounds) of fentanyl means? To put this into perspective, "at a two milligram lethal dose for most people, two pounds of fentanyl could kill 453,592 people – more than half South Dakota's 869,666 citizens" (Nelson, 2018).

These types of news reports are quite common in the Midwest. In fact, there have been five recent indictments and three guilty pleas concerning distribution of controlled substances like fentanyl and hydrocodone in South Dakota (Nelson, 2018). Anyone can get pulled into the realm of substance abuse. As Scala (2018) put it, "substance abuse is not racist, sexist, ageist or classist." It irritates me to know that drugs peddlers are undermining the efforts and progress of those who are taking actions to curb the opioid crisis.

Looking back at Herald's article, I do not believe there were any regional factors that could be attributed to the outcome of Daniel' death. The median household income in Tioga, North Dakota, \$58,478, is slightly above the national average of \$57,617 (Data USA, n.d.). Tioga has a poverty rate of 4.9% which is well below the national poverty rate. The most common Bachelor's Degree recipients are General Business Administration & Management, Teaching and Registered Nursing (Data USA, n.d.). Perhaps the outcome would have been different for Daniel if controlled substances wasn't as readily available as sending a quick text message. Because of people like Ontiveros who are still roaming the streets, these substances are ubiquitous in the black market. The only silver lining from these reports is that authorities were able to eliminate "2,680 grams (5.9 pounds) of heroin and 993 grams (2.2 pounds) of fentanyl" from the streets of South Dakota (Nelson, 2018). That is most definitely an enormous victory in undertaking opioid crisis.

Role of Dental Hygienist

It is very important to acquire a thorough and accurate medical and dental history from all patients. However, dental hygienist should pay close attention to those patients suspected of abusing drugs. During medical history process, questions should focus on patients' past and present "drug addiction, alcoholism, and substance abuse" usage (Scala, 2018). If patient is taking the required dose of prescribed opioid, the hygienist should still question the patients to evaluate how the medication affects the patient. According to Scala (2018), if the patients "list medications, inquire about them ... if they don't ... [then] ask them to verify again. If they do check those boxes on their health history, reach out to them." Dental hygienist should focus on patients' response and how they communicate. Patients' response to questions should align with the signs and symptoms observed by the hygienist.

Patients that misuse drugs often times exhibit signs that are indicative of substance abuse. For example, patients who abuse opioids will have a pinpoint-like pupils and "moderate to severe xerostomia ... followed by generalized decay occurring from the xerostomia" (Scala,

2018). This can make the patient more susceptible to caries and periodontal disease because of the reduced salivary flow. There are some signs like poor appetite and insomnia that may not be visible during a dental appointment. However, other indications such as puffy face, tremors, smell of substance on breath, increase heartbeat and blood pressure will be noticeable during routine examinations (McFarland, Giannini, & Fung, 2018). Other intraoral indicators include oral lesions or ulcerations, oral candidiasis, stomatitis, leukoplakia, leukoedema, angular cheilitis and hyperkeratosis.

A comprehensive medical history and solid understanding of the signs and symptoms associated with substance abuse will help with developing an appropriate and tailored treatment plan. Determining if a patient is abusing drug is important because the abused substance can interfere with the patient's treatment plan and direct care. For example, certain stimulants like cocaine and methamphetamine may diminish the effect of local anesthetics. As a result, the patient "may require more local anesthesia during a dental procedure – though the maximum amount of local anesthesia that can be administered remains unchanged" (McFarland et al., 2018). If a hygienist was not aware that a patient is a drug addict or if the patient did not divulge their drug history, then the hygienist might not know that nitrous oxide analgesia should be avoided in "chemically dependent patients because it is a mood-altering drug and may increase the potential for further drug abuse by creating the same or similar pleasurable sensation" (McFarland et al., 2018). Treatment plan for these types of patients will require special practitioners with experience in caring for such patients.

In order for dental hygienist to educate patients on the effects of substance abuse, the hygienist must be well-informed on regional drugs usage and current trends at the service location. This way the hygienist will be able to identify intraoral markers of drug use, encourage

patients to reach out to their primary care doctors or refer them to an addiction treatment specialist (McFarland et al., 2018). This is very important because patients who are not encouraged to seek treatment will do nothing and the "degenerative effects of continued drug use [will] increase the risk of hepatitis and HIV" (McFarland et al., 2018). Therefore, dental hygienist has a very important role not just in caring for patients but also in helping curb substance abuse. That said, this effort should start from the time the patients make their way to the dental chair to commence the medical history component.

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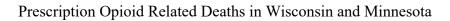
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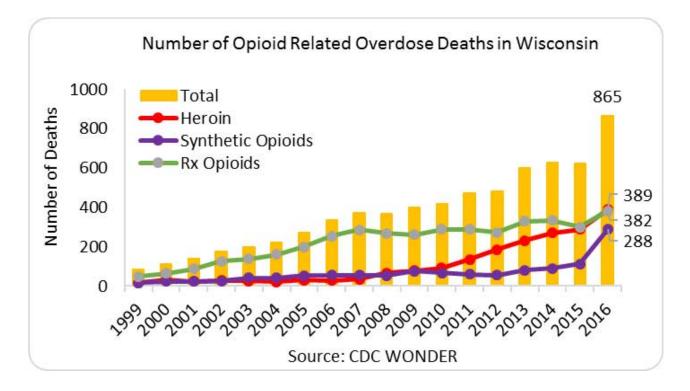
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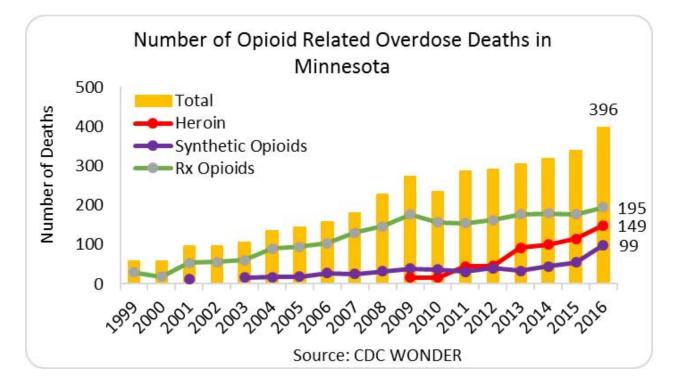
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Appendix A







Appendix B

Herald, W. (2018, November 14).

grandforksherald.com

ND bartender accused of providing heroin that caused an overdose...

By Williston Herald 2 minutes

on Nov 14, 2018 at 6:58 p.m.



TIOGA, N.D. -- A bartender at a bar in the far northwestern North Dakota town of Tioga has been accused of providing the heroin used in a fatal overdose last week.

Piper Bjornsen, 29, was charged Wednesday, Nov. 14, with delivery of a controlled substance, possession of heroin with intent to deliver and possession of meth with intent to deliver, all class B felonies.. She was ordered held Wednesday on \$20,000 bond.

Police said that Daniel Slaven, 43, bought heroin from Bjornsen on Friday and overdosed later that night. A woman who was with Slaven told officers that Slaven had exchanged text messages with Bjornsen about going to the Skol Bar in Tioga to buy heroin, according to an affidavit of probable cause filed in Northwest District Court. After buying it, the woman and Slaven went back to a home in Tioga, where Slaven injected the heroin. Police and EMTs were called to the home that evening and Slaven was pronounced dead at the Tioga Medical Center.

Police said other drugs were also found at the bar, including meth.

Kathryn Preusse, a public defender who represented Bjornsen for the bond hearing, asked for bond to be set at \$10,000. Preusse said Bjornsen wanted to post bond so she could go for treatment.

Bjornsen is scheduled to have a preliminary hearing on Dec. 13.

Link to Article:

http://www.grandforksherald.com/news/crime-and-courts/4529404-nd-bartender-accused-

providing-heroin-caused-overdose

Appendix C

Nelson, K. (2018, November 26).

argusleader.com

Man pleads guilty in SD's largest heroin, fentanyl bust

Katie Nelson, Sioux Falls Argus Leader 5-8 minutes

Published 1:47 p.m. CT Nov. 26, 2018 | Updated 8:30 a.m. CT Nov. 28, 2018

A man responsible for what is <u>believed to be the largest heroin</u> and fentanyl bust in South Dakota history has pleaded guilty in federal court.

Andy Ontiveros of South Gate, California pleaded guilty on Oct. 16 to possession with intent to distribute 400 grams or more of a substance containing fentanyl, U.S. Attorney Ron Parsons said Monday.

Ontiveros was arrested in Minnehaha County on May 28 after he allowed officers to search his vehicle, where they found 2,680 grams (5.9 pounds) of heroin and 993 grams (2.2 pounds) of fentanyl hidden inside, Parsons said.

Capt. Jason Gearman of the Minnehaha County Sheriff's Office said in June that authorities had received calls about a white pickup truck driving the wrong way on I-29, and the unlicensed truck was later found broken down on the side of the highway.

At a two milligram lethal dose for most people, two pounds of fentanyl could kill 453,592 people — more than half of South Dakota's 869,666 citizens.

More: Drug bust turns up enough fentanyl to kill 450,000 people

Ontiveros is scheduled to be sentenced in federal court on Jan. 14, 2019. The minimum sentence for Ontiveros' charge is 10 years in federal prison with a maximum sentence of life in prison and/or a \$10 million fine. Parsons said his office will continue to crack down on drug dealers in South Dakota before naming 19 people who have been indicted, pleaded guilty or sentenced to federal prison time in connection with drug trafficking and selling.

"We're not going to let up," Parsons said. "We're going to hammer the traffickers who are dealing these poisons with everything we've got."

Recent indictments

Stuart Siecke, Dean Bourn and Deon Hillard (Worthing, SD; Vermillion, SD and Minneapolis, MN) - Charged with conspiracy to distribute a controlled substance. The three men are believed to be part of a fentanyl distribution ring that stretches from Minneapolis to Yankton.

Maurice Cathey and Corrod Phillips (Both from Sioux

Falls) - Charged with conspiracy to distribute heroin, and are thought to be responsible for several drug overdoses in Sioux Falls.

Sarah Bailey and Justin Johnson (Both from Rapid City) -

Charged with conspiracy to distribute heroin. They are believed to have been dealing heroin in Rapid City, including heroin that led to the non-fatal overdose of a 15-year-old boy.

Alyssa Tuttle (Peever, SD) - Charged with obtaining a controlled substance by fraud after she allegedly obtained hydrocodone using deception.

Darcy Hoff and Michael Cooper (Both from Sioux Falls) -Charged with distribution of a controlled substance resulting in bodily injury after they allegedly dealt fentanyl that led to an overdose in Sioux Falls.

Recent guilty pleas

Shania Hofer (Sioux Falls) - Pleaded guilty to distribution of a controlled substance resulting in serious bodily injury that led to an overdose in Sioux Falls. She faces a minimum of 20 years in federal prison.

Cory Poelstra (Yankton, SD) - Pleaded guilty to superseding information that charged him with conspiracy to distribute fentanyl. He had fentanyl shipped to Yankton over the internet before selling it to others. He faces up to 20 years in federal prison.

Devlin Tommeraasen (Harrisburg, SD) - Pleaded guilty to conspiracy to distribute a controlled substance after he purchased heroin in Minneapolis before selling it in Sioux Falls. He faces up to 20 years in federal prison.

More Argus 911: Police investigating infant's life-threatening brain injury

Correction: The original version of this article stated that the search of Ontiveros' car yielded 264 grams of heroin. The U.S. Attorney's Office later clarified that the amount of heroin was actually 2,680 grams. The Argus Leader regrets the error.

Link to Article:

https://www.argusleader.com/story/news/crime/2018/11/26/man-pleads-guilty-sds-largest-

heroin-fentanyl-bust/2115282002/