

Education, Employment, and America's Opioid Epidemic

Lacy C. Overley, Arkansas State University, USA
Helen Jennings-Hood, Arkansas State University, USA
Sharon J. Davis, Arkansas State University, USA

Abstract

America is embroiled in an opioid epidemic that continues to take a toll on American citizens' quality of life, utility, and mortality rates, as well as the nation's economy. Researchers have examined information from Substance Abuse and Mental Health Services Administration's (SAMHSA) Treatment Episode Data Set (TEDS) (Drug and Alcohol Services Information Systems [DASIS], 2009) in order to get an idea about which populations are able to access opioid treatment in America, the District of Columbia, and Puerto Rico. Details of education levels and employment rates for those being treated could offer answers about individuals and populations impacted by the opioid epidemic. The purpose of this study was to examine whether individuals who had been in treatment for heroin and/or opioids in 2014 have a higher level of education than individuals in treatment for heroin and/or opioids in 1998, and to determine if individuals in treatment for heroin and/or opioids in 2014 have higher rates of employment than individuals in treatment for heroin and/or opioids in 1998 (DASIS, 2009). Researchers used a T-test on the TEDS and found statistically significant changes in levels of education and static rates of employment from 1998 to 2014 (DASIS, 2009).

Keywords: heroin, opioid, substance use disorder, opioid treatment, education, employment

On October 26, 2017, President Donald J. Trump declared the nation's opioid epidemic a public health emergency (Hirschfeld, 2017; The White House, 2017b). The White House issued a statement citing rates of death since 2000, the rate of deaths due to prescription opioids, heroin, and fentanyl, as well as the economic cost of the prescription opioid and heroin epidemic as the basis for its formal declaration of a public health emergency (The White House, 2017c). Drug overdose is the leading cause of death for Americans under the age of 50. The Partnership for Drug-free Kids (Partnership News Service, 2017) states that "Heroin and other opioids are ravaging communities across America. Deaths from heroin increased 328% between 2010 and 2015, and drug deaths from fentanyl and other synthetic opioids are now seeing a sharp rise as well" (Partnership News Service, 2018). Drug overdose deaths rose by 19% in 2016 alone, and recent research links the opioid crisis to a rise in suicide deaths or "deaths of despair" as well as a spike in violent crimes and murder (Partnership News Service, 2018; Lopez, 2018; National Institute of Justice, 2017). The White House's classification of public health emergency calls for more attention to an issue that is already prevalent in the American 24-hour news cycle, that of the growing concerns about opioid pain reliever misuse and abuse, heroin usage, and addiction, as well as the illegal use of fentanyl.

An Introduction to Opioids

According to the American Public Health Association (2017), opioid overdoses kill around 100 Americans every day. In 2012, drug overdose was found to surpass motor vehicle accidents as the leading cause of injury-related deaths in individuals 25 to 64 years of age (News, 2015). Opioids are a class of drugs that includes fentanyl (a synthetic opioid), prescription pain relievers available legally by prescription, such as oxycodone (OxyContin), hydrocodone (Vicodin), codeine, morphine, and heroin (National Institute on Drug Abuse, 2017). These drugs are derived from the opium poppy or similar synthetic compounds and all these drugs are classified as narcotics. Narcotic drugs have high abuse potential and can lead to dependence. These substances attach to opioid receptors in the brain and in addition to pain relief, they cause the user to feel a sense of relaxation, euphoria, and sedation (NIDA, 2017).

Prescription Opioid Pain Relievers

While opioid pain relievers are typically prescribed to individuals for surgery (37%) and physical medicine/rehabilitation (36%), primary care doctors write half of all opioid prescriptions in the United States (Center for Disease Control and Prevention [CDC], 2017). Over the past two decades, prescription rates for pain relievers have risen substantially. In 2006, there were 47 million prescriptions per quarter in the USA for the opioid pain relievers included in a study by Dart et al (2015). The rate of prescriptions peaked in the fourth quarter of 2012 at 62 million prescriptions. At the end of 2013, the quarterly totals for opioid prescriptions were at 60 million prescriptions (Dart et al, 2015). According to the National Institute on Drug Abuse (2017), pharmaceutical companies in the late 1990s launched a campaign that persuaded the healthcare community that prescription pain relievers would not lead to dependence in their patients. This well-funded campaign led to widespread prescribing of opioid medications. In fact, opioid analgesic medications are some of the highest prescribed medications in the USA (Machado-Alba, Gaviria-Mendoza, Vargas-Mosquera, Gil-Restrepo, & Romero-Zapata, 2017). Hydrocodone and hydrocodone products are the most often misused prescription opioid at 2.6% of all abused prescription medications reported in the 2016 National Survey on Drug Use and Health (SAMHSA, 2017b).

Heroin

In the year 2015, over 33,000 Americans died of opioid overdoses, including prescription pain relievers and fentanyl. Moreover, there are a half million people dependent on heroin (NIDA, 2017). With heroin use on the rise, (CDC, 2015; Luthra, 2017) and 4–6% of individuals who misuse prescription opioid transitioning to using heroin, the CDC cited a fivefold increase in heroin deaths from 2002 to 2014; it has been reported that over 64,000 lives were lost due to opioid abuse and misuse in 2016 (CDC, 2015; Luthra, 2017). Research shows that 4% of people who had misused prescription pain medicines started using heroin within five years (NIDA, 2017; SAMHSA, 2013). It is worth noting that around 80% of heroin users first misused prescription pain relievers (NIDA, 2017). The bridge from prescription opioid misuse to heroin use becomes more apparent each time the numbers are examined with data showing about 641,000 individuals misused prescription pain relievers and used heroin in the past year (SAMHSA, 2017b).

Fentanyl

Fentanyl is reported as being around 50 times more potent than heroin and 100 times more powerful than morphine (CDC, 2016; CDC, 2017). Fentanyl is prescribed by physicians in the form of transdermal patches or lozenges (CDC, 2017). It is mainly prescribed as a pain reliever for individuals with cancer or as an anesthetic. It is listed as a schedule II narcotic (DEA, 2017). When diverted, Fentanyl is sold for misuse and abuse in the USA (CDC, 2017). The potential profits from Fentanyl can be irresistible to dealers when 1 kg of fentanyl costs around \$4,000 to buy from China and returns profits of \$1.6 million in street sales. In contrast to Fentanyl, 1 kg heroin costs around \$6,000 but is only worth a few hundred thousand dollars in profits (The Economist, 2017). While the monetary numbers may be in the right place for those selling Fentanyl to individuals who are unable to get prescription opioids, it is far more lethal than other opioids, with only a few milligrams needed to overdose (*The Economist*, 2017; CDC, 2016; CDC, 2017). Results from the 2016 National Survey on Drug Use and Health (NSDUH) states that 228,000 individuals reported misuse of prescription Fentanyl products (SAMHSA, 2017b). The report does state that this number may not be a true representation of the number of individuals who misuse Fentanyl because the individuals may not be aware when Fentanyl is combined with heroin (SAMHSA, 2017b).

Rates of Misuse

As prescription rates have risen, so has the recreational use of these substances. In the SAMHSA's National Survey on Drug Use and Health: Detailed Tables (2017a) the rates of opioid misuse show an increase for women 12 years or older who reported using opioids in the past month, an increase in usage in the past years from 2015 to 2016 for adults aged 50 to 59 years, as well as an increase in opioid misuse in adults over their lifetime from ages 50 to 64 years (SAMHSA, 2017a). There has been a recent movement of physicians, specifically surgeons, to write fewer prescriptions for opioid pain relievers and to work toward educating individuals who the medications are being prescribed to (Howard, Waljee, Brummett, Englesbe, & Lee, 2017). While this will make some level of impact, it will take time to see results in the data on opioid misuse.

Even prescription opioids that remain unused by the individual they are prescribed to, contribute to the problem. The excess prescription medication can create an ease of availability for those who misuse opioid medications (Howard et al, 2017). According to the 2016 NSDUH,

40.4% of those who reported misusing prescription opioids stated that they got the medication from a friend or relative for free (SAMHSA, 2017b). While 8.9% stated they bought the medication from someone they knew, 3.7% individuals stated they took the medication without asking from someone they knew; 6% individuals who misuse opioids stated they bought the medication from a stranger (SAMHSA, 2017b).

Insight into Opioid Misuse

Not surprisingly, 62.3% of those who misuse prescription opioid pain relievers cite the reason for misuse as the intended use of the drug, which is to relieve pain. The element of misuse is seen when the individual takes more of the medication than they are supposed to, does not take the medication the way it has been prescribed by a doctor, or takes medication that has not been prescribed to them (SAMHSA, 2017b). Just under 13% percent of individuals stated they use opioid medication in order to “feel good or get high”, while 10.8% stated they had used opioids to “relax”. Another 3.9% stated they took opioids for help with feelings or emotions, 3.3% took opioids for help with sleep, and 3% stated they took opioids to “see what they were like” (SAMHSA, 2017, p. 23).

Overdoses Due to Opioid Misuse

The 2016 Facing Addiction in America: The Surgeon General’s Report on Alcohol, Drugs, And Health (U.S. Department of Health and Human Services [U.S. DHHS], 2016) reports that in 2015, 20.8 million people in America aged 12 or older met the criteria for a substance use disorder. Studies show that in 2014 alone, there were 28,647 people in America who died from a drug overdose involving some type of opioid. Of these 28,647 individuals who died, 10,574 were individuals who died from heroin overdoses (CDC, 2015). Recent research shows an unprecedented increase in mortality among middle-aged White Americans between 1999 and 2014 (Case & Deaton, 2015; U.S. DHHS, 2016). These trends are driven almost wholly by the misuse of opioids. The same mortality trends have not been seen in Black, Latino, and other racial and ethnic populations (Case & Deaton, 2015).

What Opioid Addiction Costs the USA

The USA spends more on healthcare than any other nation in the world and has the highest rates of prescription drug use (Squire & Anderson, 2015). The fact that the USA is the forerunner in medical spending and prescription usage is not new or shocking. Medical spending for Americans has been increasing steadily over the past decade (Squire & Anderson, 2015). Research shows that treatment for the misuse of opioids improves an individual’s productivity, health, and overall quality of life (Ettner et al, 2006). Every dollar spent on treatment for substance use disorders saves \$4 in health care costs and \$7 in criminal justice costs (Ettner et al, 2006). To get an idea of where medical spending is in relation to the opioid epidemic, SAMHSA (2016) research states that opioid pain relievers are involved in 475,000 emergency department visits each year. Five drugs – OxyContin, oxycodone, hydrocodone, propoxyphene, and methadone – accounted for two-thirds of the total economic burden in the USA (Hansen, Oster, Edelsberg, Woody, & Sullivan, 2011).

Economic losses in monetary as well as non-monetary terms are staggering as they continue to grow along with the rates of misuse of opioids. The non-monetary cost to the individual and communities affected by opioid misuse begins with the costs associated with loss of individual productivity, a reduced quality of life, and increase in abuse and neglect of children. Monetary

costs associated with opioid misuse are increased crime and violence within communities, increased spread of infectious disease (such as hepatitis and HIV), increased motor vehicle crashes, and greatly increased healthcare costs overall U.S. DHHS, 2016). According to a recent report by CNBC, the economic costs of the misuse of opioid drugs since 2001 is estimated to have topped \$1 trillion in the USA (Mangan, 2018).

Treating America's Opioid Epidemic

The U.S. Department Health and Human Services (2016) report that only one in every 10 people with a substance use disorder receive any type of specialty care – that is, a treatment which specifically focuses on recovery for those who misuse opioids post detoxification treatment. Mark, Dilonardo, Chalk, and Coffey (2002) argued more than half of individuals with substance use disorders who receive withdrawal management services do not enter treatment. Withdrawal management has been shown to be highly effective in preventing dangerous medical consequences of substance use disorders, but it is not an effective treatment of substance use disorders when used alone (Center for Health Information and Analysis, 2015; U.S. DHHS, 2016).

Individuals who are able to receive treatment for opioid and heroin misuse and addiction in the USA are surveyed by SAMHSA, and the data culminated into the Treatment Episode Data Set (TEDS) (Drug and Alcohol Services Information Systems [DASIS], 2009). TEDS information stems from SAMHSA's DASIS (DASIS, 2009). The data is collected by each state, the District of Columbia, and Puerto Rico within the 12-month period of a calendar year (DASIS, 2009). Data collected by SAMHSA records treatment for opioid and heroin misuse as well as discharge information. Individual's demographic information, drug use and misuse information, and certain relapse information, such as re-admittance (DASIS, 2009). TEDS information can be used to examine what populations are getting treatment for opioid misuse and which populations are not accessing care.

Using the TEDS, researchers can specifically look at the population demographics of individuals who are able to access treatment for opioid misuse. Using this data, this study's authors were able to see specifically the rates of employment and education levels of those receiving treatment. Statistics for these two specific demographics give researchers a better idea of who is able to access treatment for opioid misuse. A statistically significant rise in education levels as well as higher rates of employment may indicate that the populations who are impacted by opioid misuse are changing over time. While the TEDS resource is a large resource of information, it still only accounts for information gained by those individuals who are able to access care and does not include any data for those populations who may not be able or willing to access treatment for opioid misuse.

Purpose of the Study and Research Questions

Based on current trends in the literature on demographics, individuals using heroin and opioids, this study's authors wondered if there was also a change in education and employment rates (Cicero, Ellis, Surratt, & Kurtz, 2014). The purpose of this study was to see the educational and employment demographics of individuals using heroin in a 16-year period. The research questions for this study were (a) do individuals in treatment for heroin and/or opioids in 2014 have a higher level of education than individuals in treatment for heroin and/or opioids in 1998? (b) do individuals in treatment for heroin and/or opioids in 2014 have higher rates of employment than individuals in treatment for heroin and/or opioids in 1998? Findings from

this study will add to the understanding of the demographics in the USA's current heroine/opioid epidemic.

Method

Sample

The Substance Abuse Mental Health Service's Administration (SAMHSA) Treatment Episode Dataset-Admissions (TEDS-A) was used for this study. The TEDS is a publicly available dataset which includes substance abuse treatment admission data from agencies across the USA. Both public and private agencies submit their annual data to SAMHSA. TEDS-A data are collected at admissions and TED-D data are collected at discharge. Variables in the TEDS-A data set include number of prior treatments, service setting, demographics, education, employment status, referral source, substances used, route of administration, frequency of use, and age of first use. Only those admissions from 1998 and 2014 were included in this study and only first-time admissions who reported opioids or heroin as their primary substance were used. TEDS comprise individual treatment episodes and not individual clients. Therefore, the complete dataset may include the same client each time they entered treatment. This would create potential for error, and therefore, the authors only used first time treatment admissions in their analysis.

There were 1,699,971 treatment episodes entered into TEDS-A in 1998 and 2014, but after isolating only heroin and opiate users with no prior treatment, the final sample consisted of $n = 169,405$ treatment episodes. Of these, 48,985 (28.9%) were admitted in 1998 and 120,421 (71.1%) were admitted in 2014 and in the total sample, 60.7% listed heroin as their primary substance of use and 32.3% reported other opiates/synthetics. A total of 60.7% were male and 39.3% were female. The average age ranged between 30–34 with the youngest participants being between 12–14 and the oldest being over 55 years old. The average age of the first use of either opiates or heroin was between 18 and 20 years. The participants used opiates orally, through smoking, through inhalation, through injection with IV or intramuscular, or other. The following Tables 1, 2, and 3 describe the race distribution and referral sources of the sample:

Race	Frequency	Percent
Alaska Native	303	.6
American Indian (other than Alaska Native)	432	.8
Asian or Pacific Islander	445	.9
Black or African American	13,556	27.9
White	25,239	51.9
Other single race	8,653	17.8
Two or more races	0	0

Table 1: Race/Ethnicity in 1998

Race	Frequency	Percent
Alaska Native	127	.1
American Indian (other than Alaska Native)	1,466	.1
Asian or Pacific Islander	121	.1
Black or African American	11,581	9.8
White	96,037	81.5
Other single race	6,711	.6
Two or more races	1,769	1.5

Table 2: Race/Ethnicity in 2014

Primary Source of Referral		
Year of Admission	1998	2014
Individual/self-referral	54.%	55%
Alcohol/Drug Abuse Provider	13%	10%
Other Healthcare Provider	8%	7%
School	.3%	.1%
Employer/EAP	.8%	.3%
Other Community Referral	7%	8%
Court/Criminal Justice	17%	19%

Table 3: Referral Source by Year of Admission

An independent samples T-test was used to test for significant differences in education and employment between treatment admissions from 1998 and those in 2014.

Results

The mean education level of the treatment admissions from 1998 was 2.76 and the mean education for the 2014 admissions was 2.97. The higher the value, the greater the level of education. Levene's test for equality of variance was significant ($p < .00$), therefore t-test results for equality of means was used to test for significant differences. The t-test was significant ($p < .05$) with a mean difference of -.214. Table 4 and Figure 1 describe the demographic changes in relation to education from 1998 to 2014.

		EDUCATION					Total
		8 YEARS OR LESS	9–11	12	13–15	16 OR MORE	
YEAR OF ADMISSION	1998	3890 (8%)	15297 (31%)	20104 (41%)	7265 (15%)	2056 (4%)	48612
	2014	6497 (5%)	24787 (21%)	57151 (47%)	24227 (20%)	5229 (4%)	117891
Total		10387	40084	77255	31492	7285	166503

Table 4: Year of Admission Education Status Crosstabulation

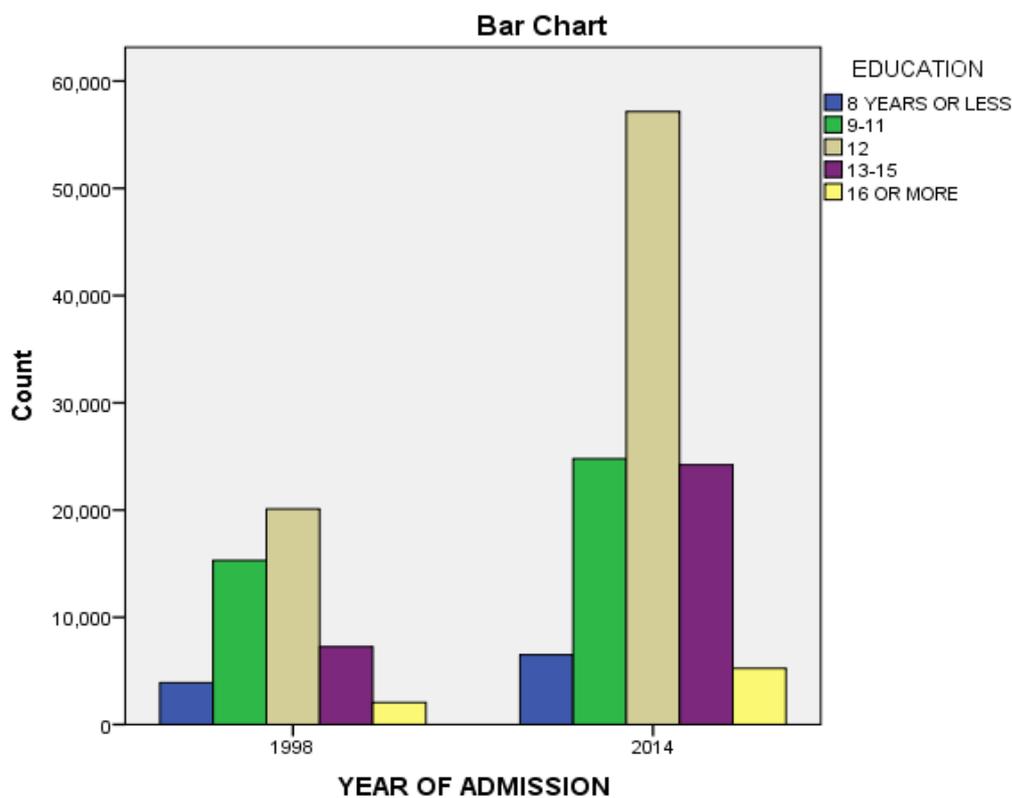


Figure 1: Bar Chart of Education Level

The mean rates of employment from 1998 and 2014 was 2.04 for both groups, which is less than part-time employment. The Levene's test for equality of variance was significant for employment between groups. The independent samples t-test for equality of means was not significant, however ($p > .05$). Table 5 and Figure 2 describe the demographic changes in relation to employment status from 1998 to 2014.

		EMPLOYMENT STATUS				Total
		FULL TIME	PART TIME	UNEMPLOYED	NOT IN LABOR FORCE	
YEAR OF ADMISSION	1998	19476 (39.8%)	16611 (34.0%)	2815 (5.7%)	9300 (19.0%)	48202
	2014	36088 (30.0%)	57676 (48.0%)	8641 (7.1%)	16331 (13.6%)	118736
Total		55564	74287	11456	25631	166938

Table 5: Year of Admission Employment Status Crosstabulation

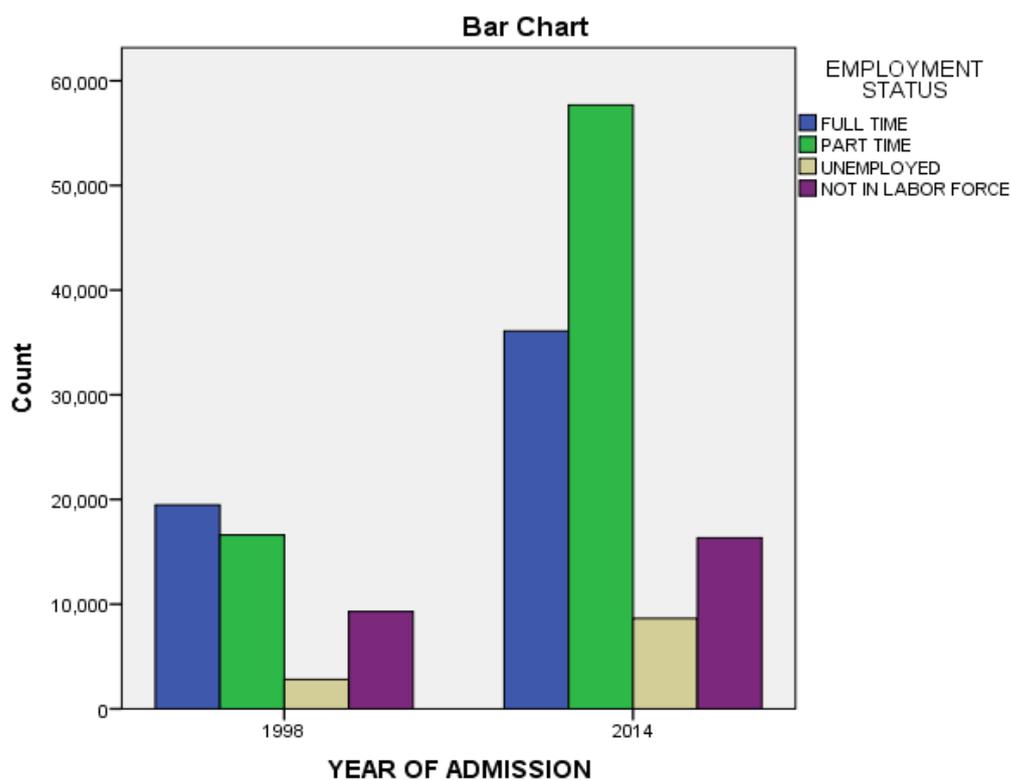


Figure 2: Bar Chart of Employment Status

Table 6 shows a summary of the group statistics for both education level and employment rates of individuals in treatment for heroin and/or opioids in 1998 and 2014.

	YEAR OF ADMISSION	N	Mean	Std. Deviation	Std. Error Mean
EDUCATION	1998	48612	2.76	.946	.004
	2014	117891	2.97	.902	.003
EMPLOYMENT STATUS	1998	48202	2.96	1.110	.005
	2014	118736	2.96	.962	.003

Table 6: Group Statistics

Discussion

The purposes of this study were to examine whether individuals in treatment for heroin and/or opioids in 2014 have a higher level of education than individuals in treatment for heroin and/or opioids in 1998, and to determine if individuals in treatment for heroin and/or opioids in 2014 have higher rates of employment than individuals in treatment for heroin and/or opioids in 1998. As hypothesized, the levels of education in individuals in treatment for heroin and/or opioid misuse in 2014 showed a statistically significant rise from individuals in treatment for heroin and/or opioids in 1998 (DASIS, 2009). The results of this study tie into the literature about the vast changes in the demographics of individuals using heroin and/or opioids (Cicero et al., 2014; Cleland, Rosenblum, Fong, & Maxwell, 2011). Cicero, et al. (2014) stated that the data showed more users were older and from more suburban areas, as compared to previous decades when the majority of individuals were from inner cities. They also noted the participants in their study were more likely to use heroin as a gateway from previously prescribed opioids (p. 825, 2014).

While the change in the data for populations being treated for opioid heroin and/or opioid misuse show some marked changes, the t-test analysis of the data shows that levels of employment have not risen significantly from 1998 to 2014 (DASIS, 2009). This information is not consistent with the hypothesis that was made for the purposes of this research. Inferences will not be made here about what the research data reflects in relation to the unchanging employment status of those being treated for heroin and/or opioid misuse.

When looking at the presented data in this study and other research (CDC, 2015; Cicero et al., 2014; Cleland et al., 2011; Dart et al., 2015; Luthra, 2017; NIDA, 2017; SAMHSA, 2013) the conclusion could be made that individuals with higher education have more readily access to opioids due to location. Individuals who use heroin are typically those that started with opioid prescriptions and transitioned to heroin use due to ease of access and increased expense of keeping up the misuse of opioid pain relievers (NIDA, 2017; Cicero et al, 2014).

With these changes and combined demographic understanding of this population, professionals are able to create a clearer conceptualization of individuals who use heroin/opioids.

Implications for Practice

As professionals, it is important to understand who the client is. This study informs professionals working with individuals with substance use disorders that the changing trends in demographics of individuals using heroin and/or opioids also reaches education levels. While education level has changed employment, rates have not. To better understand clients who use heroin/opioids, researchers must further explore the specific differences in education and employment rates of this population. Having a clear understanding of individuals who use heroin/opioids is beneficial for not only practitioners working with individuals but also those who are working proactively to stop this epidemic. These results will inform professionals of their target audience for interventions and educational purposes. Professionals need to recognize not only who their clients are, but that they are changing. This will hopefully lead to looking at the bigger picture of drug use, education, and treatment.

Limitations and Suggestions for Future Research

The researchers believe the results from this study were very informative in expanding the demographic understanding of individuals in treatment for heroin/opioid use. At the same time, the authors are aware of several limitations of the study. First, the TEDS-A database used for data analysis only looks at individuals who are in treatment. The authors did not look at individuals who could not, or chose not, to access treatment. Second, 2014 is the most recent data set available through TEDS-A. Based on this data, the authors cannot determine whether any additional demographic changes have occurred in the last four years concerning education and employment. In addition, TEDS-A does not collect data from all treatment facilities, only those receiving public funding. For a clearer and broader picture of individuals using heroin/opioids, it would be beneficial to look at all treatment facilities and those not in treatment. Third, the authors did not further delve into the subcategories of heroin and opioids (e.g. hydrocodone, OxyContin, etc.). The authors chose to look at the broader scope of heroin and opioids.

More research is needed to determine longitudinal changes in the education levels and employment rates of those being treated for heroin and/or opioid misuse as well as what this may mean for the future of heroin and/or opioid misuse in the USA (DASIS, 2009). It would be beneficial to review TEDS data when it is updated to determine if the current findings are still accurate. As understanding of the demographics of this population grows, it will be important to further explore how to more accurately address this epidemic of using heroin/opioids. It would be beneficial for researchers to explore and gain understanding of the shift in demographics of individuals using heroin and/or opioids. In addition, research pertaining to the mental health issues behind heroin/opioid addiction could broaden the understanding of increased use. While understanding mental health issues, it is also important to understand the treatment being provided. Are the individuals getting access to treatment, and is the treatment effective? Further research is needed to ensure these individuals have the best possible care.

Conclusion

Through this study, the authors were able to expand the understanding of today's individuals who use heroin and/or opioids. The authors found through the TEDS-A data that there have been statistically significant amounts of change in this population in terms of level of education, but not in employment rates. This new demographic information is intriguing because while the individuals in 2014 have higher levels of education, they are no more employed than the individuals in 1998. Better understanding of this population will help professionals not only conceptualize who they are working with, but also provide more focused preventative measures.

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Corresponding author: Lacy C. Overley

Email: lcrumrine@astate.edu