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Comorbidities of Drug Abuse among Emergency Department Patients

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Abstract

Drug abuse is responsible for more than a million visits to the emergency department (ED) in the United States each year. The objective of this study is to examine both the social and health history of patients presenting to the ED for drug abuse, with a focus on depression, alcohol abuse and HIV/AIDS as comorbidities. The study utilized data from the yearly National Hospital Ambulatory Medical Care Survey (NHAMCS). Chi square was used to test for differences between individuals with drug abuse related ED visit and individuals who visited the ED for other reasons. Logistic regression was applied to determine the likelihood of a drug abuse related ED visit due to psychiatric and medical comorbidities, controlling for known confounders. Drug abuse accounted for 1,924,099 visits to the ED during the survey year. When compared to individuals who visited the ED for non-drug abuse related reasons, patients who came to the ED due to drug abuse presented in higher proportions with a history of alcohol abuse (20.71% vs. 2.54%, $p<0.0001$), depression (29.44% vs. 9.04%, $p<0.0001$), and HIV/AIDS (1.78% vs. 0.39%, $p<0.0001$). Separate analytical models for psychiatric and medical comorbidities were adjusted for socio-demographic correlates. The results show that patients with a drug abuse/overdose related ED visit had increased odds of alcohol abuse (AOR 6.56, 95% CI 6.53 to 6.59), depression (AOR 3.64, 95% CI 3.63 to 3.65), and HIV/AIDS(AOR 2.60, 95% CI 2.57 to 2.63). The findings indicate that alcohol abuse, depression, and HIV/AIDS are important comorbidities which are associated with drug related ED visits.

Keywords: Drug abuse; Overdose; Emergency department; NHAMCS; Alcohol; Depression; HIV; Comorbidity

Abbreviations: NHAMCS: National Hospital Ambulatory Medical Care Survey; PSU: Primary Sampling Units; ED: Emergency Departments; OPD: Outpatient Departments; DAWN: Drug Abuse Warning Network.

Introduction

Drug abuse is one of the leading causes of preventable deaths in the United States [1,2]. It is responsible for more than a million visits to the emergency room each year [2]. In 2016, 64,000 of the overdose cases resulted in untimely deaths2. The total economic burden due to the problem is estimated at $276 billion dollars yearly; a majority of the cost resulting from loss to productivity and healthcare expenditure [3]. It is generally believed that the majority of patients who abuse drugs have pre-existing social, behavioral, and medical traits which predispose them to maladaptive drug behavior [4,5,6]. Previous studies have focused extensively on the social aspects of drug abuse [6,7]. For instance, it is known that race age, and income level is significant social factors which affect the odds for drug abuse. However, much less

is known regarding the role that psychiatric and medical comorbidities play in predisposing patients to drug abuse. In order to devise an effective intervention strategy to combat drug abuse, it is important that all risk factors are taken into account. As such, more studies are needed to examine the relationships between patent's medical history and the risk for drug abuse/overdose. The current study examined the associations between a selected number of psychiatric and medical conditions and drug abuse/overdose. Whereas the majority of the existing studies utilized convenience sampling based on data from local emergency departments [8,9], the current study addresses the problem from a national perspective. Based on survey data from the 2015 NHAMCS study10, this study attempts to answer two questions using the following aims: Aim 1: Describe the key demographic characteristics of patients who report to the ED with drug abuse/overdose. Aim 2: Determine whether psychiatric and medical comorbidities (specifically depression, alcohol abuse and HIV/AIDS) are risk factors for drug-related emergency room visits.

Methods

This study utilized data from the 2015 National Hospital Ambulatory Medical Care Survey (NHAMCS) [10]. The National Hospital Ambulatory Medical Care Survey (NHAMCS) collects data on the use of ambulatory care services in hospital emergency and outpatient departments and ambulatory surgery locations. It uses a national sample of visits to the emergency departments, outpatient departments, and ambulatory surgery locations of non-institutional general and short-stay hospitals. Data utilization from the study is permissible under Section 306 of the Public Health Service Act (Title 42, U.S. Code, 242k) allowing data collection for the sole purpose of health research10. As such, the requirement for Informed consent from participants was not required. Furthermore, all potentially identifying information, such as patient's name or account numbers are masked from the public-use dataset.

Study design

The 2015 NHAMSC survey utilized a 4-stage probability sampling design. Stage 1 divides the country into 4 geographical regions or Primary Sampling Units (PSU) namely: Northwest, Midwest, South and West. In stage 2 of the sampling, hospitals were selected at random within each PSU. Stage 3 selected Outpatient Departments (OPD) and all Emergency Departments (ED) within the Hospitals. In the final stage, study data for selected patients were abstracted using an automated patient record form. The survey instrument collected data regarding patient characteristics, reason for visit, and the type of treatment rendered during the visit. For the Purpose of this study, only data collected from the ED component of the survey was used. All subjects for whom a valid ICD-9 code was recorded for the visit diagnosis in item 5 of the survey instrument were included in the study.

Predictor/ Independent variable

For aim 1, the independent variables of interest were age, sex, and race of the patient as well as the type of medical insurance used for payment, geographic location of residence and whether or not the individual lived in a metropolitan area? For aim 2, the independent variables of interest were whether the patient had a history of one or more of the following psychiatric and medical conditions: alcohol abuse, depression, or HIV/AIDS. Each diagnosis in the NHAMSC 2015 survey is assigned a unique 5-character identification number based on the ICD-9-CM diagnosis code. The following ICD codes corresponding to the attached diagnosis were used: alcohol abuse (305.00-305.03), depression (296.30), HIV (795.71). Binary variables were created, to categorize the status of the patients for psychiatric or medical condition.

Outcome/Dependent variable

The dependent variable of interest was drug abuse related Emergency Department visit status. The NHAMCS 2015 survey uses ICD-9-CM diagnosis codes for defining the cause for the patient's visit to the Emergency Department10. In addition to the alphanumeric ICD codes, the NHAMCS 2015 also contains numeric recodes created to facilitate the analysis of visit data. The numeric code 7000 corresponding to ICD code 305.90-305.93 was used. For the purposes of this study, a binary variable was created to reflect whether the visit was drug abuse related or not.

Confounding variables

For aim 2, the following were considered as possible confounders in the relationship between our exposure and outcome variables: sex, age, race, method of payment, geographical region and whether the patient lived in a metropolitan area. Each variable was further broken down into categories for a more detailed analysis. We dichotomized "sex" into male and female. For age , we considered the following categories: under 15 years, 15-24 years, 25-44 years, 45-64 years, 65-74 years, and 75 years and older. We categorized "race" as Hispanic, Non-Hispanic White, Non-Hispanic Blacks, and Others. Others combine the small groups of Native Americans, Asians and Pacific Islanders. "Method of payment" was classified as private insurance, Medicaid, Medicare, and Others. Others combine payments from worker's compensation, charity

care, and individuals who self-pay. We categorized "geographical region" as Northeast, Midwest, South, and West. Confounders were selected a priori based on the literature on the relationship between opioid use and our selected risk factors.

Data analysis

Public data files for the NHAMCS 2015 were obtained from the Center for Disease Control (CDC) website10. Statistical analysis of the data was performed using SAS Studio, Red Hat 64 (SAS Institute Inc.). Variables of interest, as well as recodes of pertinent variables were generated as needed to create a data subset for analysis. For our first aim, the test of proportion was used to compare the frequencies of the socio demographic factors between patients presenting to the ED for drug abuse with patients visiting the ED for other reasons besides drug abuse. For our second aim, the test of proportion was also used to compare the frequencies of the following comorbid conditions between the two groups: alcohol abuse, depression, HIV. Further analysis was done using both simple and multiple logistic regressions to investigate the relationship between each of the comorbid conditions and drug abuse. Sample weights were used to obtain estimates that are representative of the true population distribution. A probability value of <0.05 was considered to be statistically significant.

Results

Aim 1: Drug abuse and socio-demographic variables

A comparison of demographic variables showed statistically significant differences between patients who came to the ED due to drug abuse versus patients who came due to other reasons. Higher proportions of Individuals aged 15-64 appeared in the drug abuse group compared to the non-abuse group; with the vast majority falling within the 24-44 years age bracket. (44.92% vs 28.35%, p<0.0001). Patients in the drug abuse category had a higher proportion of individuals who were male (Table 1, 58.94% vs 44.36%, p<0.0001) and Non-Hispanic White (59.17% vs 58.77%, p<0.0001) compared to individuals who did not have a drug abuse related ED visit. There was a higher proportion of individuals on Medicaid within the drug abuse group compared to the non-abuse group (37.1% vs 31.07%, p<0.0001). Overall Medicaid was the most utilized payment method among all emergency room patients. A comparison of geographic distribution showed that drug abuse was recorded in higher proportions in metropolitan areas, both in the northeast and western parts of the country (25.15% vs 17.21%, p<0.0001; and 25.97% vs 20.00%, p<0.0001 respectively) (Table 1).

Socio-demographic Comparisons by Exposure					
	Drug Abuse Group		Non-Abuse Group		
	Weighted Frequency	%	Weighted Frequency	%	P-value
AGE*					
<15 years	34984	1.82	2.71E+07	20.09	<0.0001
15-24 years	479647	24.93	1.97E+07	14.57	
24-44 years	864292	44.92	3.83E+07	28.35	
45-64 years	493323	25.64	2.86E+07	21.20	
65-74 years	50345	2.62	9746968	7.22	
>75 years	1508	0.08	1.16E+07	8.57	
SEX*					
Male	1134031	58.94	5.99E+07	44.36	<0.0001
Female	790068	41.06	7.51E+07	55.64	
RACE*					
Non-Hispanic White	1138450	59.17	7.94E+07	58.77	<0.0001
Non-Hispanic Black	456108	23.71	2.98E+07	22.04	
Other	7374	0.38	3645177	2.70	
Hispanic	322167	16.74	2.23E+07	16.49	
INSURANCE*					
Medicaid/CHIP	713852	37.10	4.20E+07	31.07	<0.0001
Medicare	252247	13.11	2.40E+07	17.81	
Other	645342	33.54	3.16E+07	23.39	
Private Insurance	312658	16.25	3.75E+07	27.73	
REGION*					
Northeast	483989	25.15	2.32E+07	17.21	<0.0001

West	499760	25.97	2.79E+07	20.00	
Midwest	391883	20.37	3.27E+07	24.21	
South	548467	28.51	5.12E+07	37.90	
METROPOLITAN STATUS*					
Metropolitan	1759654	91.45	1.16E+08	86.14	<0.0001
Non-Metropolitan	164445	8.55	1.87E+07	13.86	
ALCOHOL ABUSE*					
Yes	398541	20.71	3426350	2.54	<0.0001
No	1525558	79.29	1.32E+08	97.46	
DEPRESSION*					
Yes	566524	29.44	1.22E+07	9.04	<0.0001
No	1357575	70.56	1.23E+08	90.96	
HIV/AIDS*					
Yes	34229	1.78	531737	0.39	<0.0001
No	1889870	98.22	1.35E+08	99.61	
Totals	1924099	100	1.35E+08	100.00	

Table 1: Socio-demographic Comparisons by Exposure.

Bivariate analysis also show that ED patients in the drug abuse category had a higher likelihood of having a history of alcohol abuse (OR 10.03, 95% CI 10.00 – 10.07)), depression OR 4.20, 95% CI 4.19 – 4.21)), and HIV (OR 4.59, 95% CI 4.54 – 4.64). After adjusting for the effect of confounders in separate multivariate regression models, results show that ED patients in the drug abuse category still had a higher albeit attenuated odds of having a history of alcohol abuse (AOR 6.56, 95% CI 6.53 – 6.59), depression (AOR 3.63, 95% CI 3.63 – 3.65) and HIV (AOR 2.60, 95% CI 2.57 – 2.63) compared to patients in the non-drug abuse category (Tables 2,3,4). In addition to the overall change seen when comparing between our crude and adjusted models, we observed subtle differences when comparing the effect of confounders on the relationship between each of our exposure and outcome variables. When compared against Hispanics, it was found that among individuals with a history of alcohol abuse, and a history of HIV/AIDS the highest likelihood of drug abuse occurred among Non-Hispanic Whites (AOR 1.30, 95% CI 1.30 – 1.31) and (AOR 1.28, 95% CI 1.28 – 1.29) respectively. On the contrary, among individuals with a history of depression we observed the highest likelihood of drug abuse among Non-Hispanic Blacks (AOR 1.16, 95% CI 1.16 – 1.17).

The Association Between Having A History Of Alcohol Abuse And Drug Related ED Visits		
Adjusted Odds Ratio (95%CI)		
Alcohol Abuse		
No	**1.00**	
Yes	6.56	(6.53 - 6.59)
Covariates		
SEX		
Female	**1.00**	
Male	1.72	(1.72 – 1.73)
AGE		
>75 Years	**1.00**	
<15 Years	14.24	(13.53 - 15.00)
15-24 Years	273.18	(259.68 - 287.39)
25-44 Years	217.31	(206.58 - 228.60)
45-64 Years	147.30	(140.04 - 154.96)
65-74 Years	35.18	(33.42 - 37.03)
RACE*		
Hispanic	**1.00**	
Non-Hispanic White	1.30	(1.30 - 1.31)
Non-Hispanic Black	1.25	(1.24 - 1.25)

Other	0.14	(0.14 - 0.14)
INSURANCE*		
Private Insurance	**1.00**	
Medicaid/CHIP	2.53	(2.52 - 2.54)
Medicare	3.16	(3.14 - 3.18)
Other	2.24	(2.23 - 2.25)
GEOGRAPHIC REGION		
South	**1.00**	
Northeast	1.72	(1.72 - 1.73)
West	1.47	(1.47 - 1.48)
Midwest	0.98	(0.97 - 0.98)
METROPOLITAN STATUS		
Non-Metropolitan	**1.00**	
Metropolitan	1.52	(1.52 -1.53)

Table 2: The Association between having a History of Alcohol abuse and Drug Related ED Visits.

The Association between having a diagnosis of depression and drug related ED visits		
Adjusted Odds Ratio (95%CI)		
Depression		
No	**1.00**	
Yes	3.64	(3.63 - 3.65)
Covariates SEX		
Female	**1.00**	
Male	2.18	(2.17 - 2.19)
AGE		
>75 years	**1.00**	
<15 years	12.42	(11.79 - 13.08)
15-24 years	240.45	(228.56 - 252.96)
25-44 years	198.24	(188.45 - 208.54)
45-64 years	137.79	(130.99 - 144.95)
65-74 years	37.10	(35.24 - 39.05)
RACE*		
Hispanic	**1.00**	
Non-Hispanic White	1.11	(1.10 - 1.11)
Non-Hispanic Black	1.16	(1.16 - 1.17)
Other	0.15	(0.15 - 0.16)
Insurance*		
Private Insurance	**1.00**	
Medicaid/CHIP	2.41	(2.40 - 2.42)
Medicare	2.44	(2.42 - 2.45)
Other	2.17	(2.16 - 2.18)
Geographic Region		
South	**1.00**	
Northeast	1.69	(1.69 - 1.70)
West	1.49	(1.48 - 1.49)
Midwest	0.95	(0.94 - 0.95)
Metropolitan Status		
Non-Metropolitan		**1.00**
Metropolitan		1.56 (1.56 -1.57)

Table 3: The Association between having a diagnosis of depression and drug related ED visits.

The Association between having a HIV/AIDS Diagnosis and Drug Related ED Visits		
Adjusted Odds Ratio (95%CI)		
HIV/AIDS		
No	**1.00**	
Yes	2.60	(2.57 -2.63)
Covariates		
SEX		
Female	**1.00**	
Male	1.97	(1.97 - 1.98)
AGE		
>75 years	**1.00**	
<15 years	12.98	(12.33 - 13.67)
15-24 years	284.11	(270.07 - 298.87)
25-44 years	247.99	(235.75 - 260.86)
45-64 years	176.63	(167.92 - 185.79)
65-74 years	40.73	(38.70 - 42.87)
RACE*		
Hispanic	**1.00**	
Non-Hispanic White	1.28	(1.28 - 1.29)
Non-Hispanic Black	1.18	(1.18 - 1.19)
Other	0.17	(0.17 - 0.18)
INSURANCE*		
Private Insurance	**1.00**	
Medicaid/CHIP	2.60	(2.59 - 2.61)
Medicare	3.05	(3.03 - 3.06)
Other	2.23	(2.22 - 2.24)
GEOGRAPHIC REGION		
South	**1.00**	
Northeast	1.82	(1.81 - 1.83)
West	1.55	(1.55 - 1.56)
Midwest	1.08	(1.07 - 1.08)
METROPOLITAN STATUS		
Non-Metropolitan	**1.00**	
Metropolitan	1.59	(1.58 -1.59)

Table 4: The Association between having a HIV/AIDS Diagnosis and Drug Related ED Visits.

Discussion

The significance of socio-demographic variables in relation to drug abuse has important clinical implications. The findings from the current study shows that patients who are treated in the ED for drug abuse have the highest tendency to be male, young adults (aged 15 to 24 years), using Medicaid insurance, living in the Northeast, and in a metropolitan area (Table 5). The current study also provides evidence that psychiatric and medical comorbidities have important implications. It demonstrates that individuals who are treated for drug abuse also have a likelihood either have a diagnosis of depression, have a history of alcohol abuse or tested positive for HIV in the past.

Association between selected demographic factors and drug abuse related ED visits			
	Crude Odds Ratio	**95% Confidence Interval (CI)**	
SEX			
Female	**1.00**		
Male	1.80	1.79	1.81

AGE			
>75 years	**1.00**		
<15 years	9.89	9.39	10.41
15-24 years	186.88	177.67	196.57
25-44 years	173.07	164.55	182.03
45-64 years	132.10	125.59	138.94
65-74 years	39.59	37.62	41.67
RACE*			
Hispanic	**1.00**		
Non-Hispanic White	0.99	0.99	0.99
Non-Hispanic Black	1.06	1.05	1.06
Other	0.14	0.14	0.14
INSURANCE*			
Private Insurance	**1.00**		
Medicaid/CHIP	2.04	2.03	2.05
Medicare	1.26	1.25	1.26
Other	2.45	2.44	2.46
GEOGRAPHIC REGION			
South	**1.00**		
Northeast	1.94	1.94	1.95
West	1.67	1.66	1.68
Midwest	1.12	1.11	1.12
METROPOLITAN STATUS			
Non-Metropolitan	**1.00**		
Metropolitan	1.72	1.71	1.73
ALCOHOL ABUSE			
No	**1.00**		
Yes	10.03	10.00	10.07
DEPRESSION			
No	**1.00**		
Yes	4.20	4.19	4.21
HIV/AIDS			
No	**1.00**		
Yes	4.59	4.54	4.64

Table 5: Association between selected demographic factors and drug abuse related ED visits.

The findings from the current study are consistent with those from previous studies which have shown a higher incidence of drug abuse among young and middle aged adults [5,11]. Using participants older than 65 years as the reference group, one study found that adults within the age group 18 to 29years old had the highest odds for drug abuse, followed by age group 30-40, 45-64 (AOR 35.7, 19.7, 6.6) respectively [5]. Racial differences in drug abuse has been well studied; with the evidence pointing to Whites as having the highest risk for drug abuse [12,13]. In a related study, Non-Hispanic Whites were found to be more likely to receive opioid prescription from the ED followed by Non-Hispanic Blacks (23%), and Hispanics (24%); which may partly explain why the overall abuse rate is higher among Whites [7]. Further studies may be needed to explore disease specific factors that affect racial disparities with regards to drug abuse.

The current study's finding on sex differences for drug related ED visits is consistent with sex differences in drug abuse reported in the literature [4,14,15]. In a study based on the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) survey5, male participants were shown to be at increased odds for drug abuse compared to females (AOR 2.6, CI 1.9 – 3.5). Similar to the NHAMSC survey, NESARC surveys gather information regarding associated risk factors for substance abuse. However, the NHAMCS data used in the current study provides added reliability due to the fact that the data is collected by healthcare professionals within the context of a clinical setting compared to the community setting used in other surveys. As of 2015 the NHAMCS survey did not include data at the state level. Therefore inferences based on the findings in the current study may only be drawn on a regional level. Similar to

this study's findings, previous studies have found that the Northeast and Western regions of the country have been identified as posing the highest risk for drug abuse compared to the Midwest and South [13,16]. It is worth pointing out that the Northeast and West also contains the highest concentration of metropolitan [17] areas; which may explain the increased risk for drug abuse found among participants from metropolitan areas. Future studies may add to current knowledge by exploring specific factors which contribute to the problem on a local level. The results from the current study show that confounders play a significant role in the association between each of the three exposure variables and drug abuse. In comparing the three models (Tables 2,3,4), it should also be noted that the risk for drug abuse due to each comorbid conditions is influenced by the individual's social history. For instance, with regards to race we observed that the highest race risk groups were not consistent throughout all 3 models and thus may indicate that the risk factors are different by race. The study results show that all things being equal, drug abusers are approximately seven times more likely to have abused alcohol in the past compared to the rest of the population. Similar results have been demonstrated in an Epidemiologic Catchment Area (ECA) study which included both community and institutional based participants [4]. The findings in the current study confirm that the association between drug and alcohol abuse is persistent across different settings.

Among the study participants, a prior history of depression was shown to multiply the odds for drug abuse. This confirms what is already known from the literature [18]. Findings from a similar study also shows that the onset of depression almost always precedes the diagnosis of drug abuse; suggesting that drug use may have been initiated as a mechanism for coping with depression. This supports the theoretical framework for the current study which considers depression as an exposure variable leading to drug abuse. People with a history of drug abuse have been shown to have a higher risk of HIV than the general population [19]. The results from the current study show that the reverse is also true. Drug abusers are approximately three times more likely to have been exposed to HIV/AIDS in the past.

Strengths and Limitation

This study was based on the most current data available from the yearly NHAMCS survey. The dataset is publically available for download from the CDC website. Pre-made input statements are available for multiple statistical packages; making the data files optimal for reading and formatting in SAS. Although the study is based on a large sample size, some of the variables were observed in low frequencies. Therefore, the inclusion of weights in our regression models ensured that estimates obtained in our analysis were reflective of the true population distribution. Compared to the National Survey on Drug use and Health (NSDUH) which gathers drug-use data based on community based interviews collected directly from participants, the NHAMCS study design provides more reliable information based on clinical data collected by healthcare professionals. Based on a 4 stage probability sampling, 374 ED service areas were identified as being within scope and eligible for the study; out of which 291 fully responded. The resulting un weighted response rate was 77.8%. The use of ICD-9 codes in defining our study variables provides added confidence that the chosen variables are reflective of the research question that is being answered. In using the broad diagnosis term of "drug abuse" as the outcome variable, the study does not make the distinction between the different types of drugs that may have been involved in the adverse event. As such any inferences drawn based on the findings from this study should be considered in that context. The estimates obtained in the study were based on the patient's medical history and diagnosis recorded during the current ED encounter. As such, potential cases of undocumented exposure may have been inadvertently excluded. For instance a patient may have presented with subclinical signs of depression but visited the ED due to other medical reasons. This may have biased our findings towards the null. Furthermore, the patient's recollection of previous medical history is prone to recall bias. Finally, due to the complex interaction between our exposure and outcome variables, the findings obtained within the current study may not be sufficient to prove causality.

Conclusion

Drug abuse has been shown to be highly comorbid with other physical and mental disorders. Keeping this in mind, it is important that while providers implement a plan to treat an acute problem pertaining to drug abuse, that long-term strategies are devised to identify and address comorbid conditions with which patients present. According to the Drug Abuse Warning Network (DAWN), approximately 30% of all drug related ED visits each year occurs as a result of alcohol use; either alone or in combination with other drugs [13]. As such the importance of treating any comorbid alcohol use disorder with the same level of attention as the presenting medical problem cannot be overstated. As shown in the current study, differences exist in the socio-demographic characteristics of patients who report to the ED for drug abuse compared to patients who report for other reasons.

In order to mitigate the current trend, it is important that public health measures are put in place to provide targeted interventions at the community level to the most at-risk individuals based on the identified risk factors. Future studies should build upon the findings in the current study in multiple ways. Firstly, while the current study was able to establish significant relationships between certain health comorbidities and drug abuse, the evidence is limited to the pattern found within the Emergency Department. As such the current study underestimates the true magnitude of the problem. More studies are needed to combine data from the emergency department with those from other healthcare institutions where patients are treated for drug abuse. While the current study provides a snapshot in time of the association between drugs related ED visits and medical comorbidities, it does not establish a causal relationship. Longitudinal studies are needed to study chronic drug user's overtime, in order to identify significant risk factors which influence drug abuse. Finally, drug abuse continues to constitute a big burden to public health. Findings from the current study show that the problem is multidimensional, and involves social, physical and mental health factors. Therefore, it is important that healthcare professionals adopt a holistic approach to solving the problem.

References

1. Centers for Disease Control and Prevention (2018) U.S. drug overdose deaths to rise; increase fueled by synthetic opioids.

2. Albert M, McCaig LF, Uddin S (2015) Emergency department visits for drug poisoning: United States, 2008-2011. NCHS Data Brief (196): 1-8.

3. Florence CS, Zhou C, Luo F, Xu L (2013) The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013. Med Care 54(10): 901-906.

4. Regier DA, Farmer ME, Rae DS, Locke BZ, Keith SJ, et al. (1990) Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. JAMA 264(19): 2511-2518.

5. Compton WM, Thomas YF, Stinson FS, Grant BF (2007) Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the national epidemiologic survey on alcohol and related conditions. Arch Gen psychiatry 64(5): 566-576.

6. Kreek MJ, Nielsen DA, Butelman ER, LaForge KS (2005) Genetic influences on impulsivity, risk taking, stress responsivity and vulnerability to drug abuse and addiction. Nat neuro sci 8(11): 1450-1457.

7. Pletcher MJ, Kertesz SG, Kohn MA, Gonzales R (2008) Trends in Opioid Prescribing by Race/Ethnicity for Patients Seeking Care in US Emergency Departments. JAMA 299(1): 70-78.

8. Butler MM, Ancona RM, Beauchamp GA, Yamin CK, Winstanley EL, et al. (2016) Emergency department prescription opioids as an initial exposure preceding addiction. Annals of emergency medicine 68(2): 202-208.

9. National Center for Health Statistics. Ambulatory health care data.

10. Heslin KC, Elixhauser A, Steiner CA (2015) Hospitalizations Involving Mental and Substance Use Disorders Among Adults, 2012. HCUP.

11. Singhal A, Tien YY, Hsia RY (2016) Racial-ethnic disparities in opioid prescriptions at emergency department visits for conditions commonly associated with prescription drug abuse. PLoS One 11(8): e0159224.

12. Network DA (2016) The DAWN report. National estimates of drug-related emergency department visits.

13. Volkow ND (2012) Drug Abuse and HIV. Washington, DC: National Institute of Drug Abuse.

14. Wilsey BL, Fishman SM, Ogden C, Tsodikov A, Bertakis KD (2008) Chronic pain management in the emergency department: a survey of attitudes and beliefs. Pain Medicine 9(8): 1073-1080.

15. Becker JB, Hu M (2008) Sex differences in drug abuse. Frontiers in neuroendocrinology 29(1): 36-47.

16. Hasegawa K, Espinola JA, Brown DF, Camargo CA (2014) Trends in US emergency department visits for opioid overdose, 1993–2010. Pain medicine 15(10): 1765-1770.

17. Centers for Disease Control and Prevention. Morbidity and Mortality Report.

18. Deykin EY, Levy JC, Wells V (1987) Adolescent depression, alcohol and drug abuse. American Journal of Public Health 77(2):178-182.

19. Carroll ME, Lynch WJ, Roth ME, Morgan AD, Cosgrove KP (2004) Sex and estrogen influence drug abuse. Trends in pharmacological sciences 25(5): 273-279.

20. Wisniewski AM, Purdy CH, Blondell RD (2008) The epidemiologic association between opioid prescribing, non-medical use, and emergency department visits. J Addict Dis 27(1): 1-11.

21. United States Census Bureau. Population distribution.