

Demographic Characteristics – Age, Race, and Gender – and Type of Opioid Narcotic Prescribed in Washington, Indiana

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Abstract

Background:

While prescribed opioids are recognized for their effectiveness in the treatment of pain, the increased use and abuse of these substances have contributed to an increased number of overdose cases and to opioid-related deaths. For the state of Indiana, the death rate from opioid overdose increased five times between the years 1999 and 2015. Thus, the purpose of this current study is to determine the distribution of various types of opioids by gender, race, and age among patients treated at Daviess Community Hospital Emergency Room in Washington, Indiana (USA).

Methods:

Opioid prescriptions were tracked for one hundred patients seen at the Daviess' Emergency Room. Only patients who had been regularly prescribed opioids and been using them for a minimum of 90 days were eligible for the current study. The study was descriptive in nature, and data analysis consisted of frequencies and percentages of participants by demographic variables and the types of opioids prescribed.

Results:

When stratifying participants by gender, race, and age group, hydrocodone was generally the most commonly prescribed opioid. However, just under half (47.6%) of patients between the ages of 43 and 53 years were prescribed Percocet. Fioricet, morphine, and methadone were the least commonly prescribed opioids.

Conclusion:

Because of the potential of abuse and substance-related overdose of prescribed opioids, the Indiana Prescription Monitoring Program was implemented, which allows medical professionals to track the use of controlled substances. However, many health professionals may not be aware of the availability of such tools. Given that abuse and overdose continues with prescribed opioids, it is recommended that health professionals are educated in these tracking tools and educate their patients and communities of the risk of opioid abuse.

Key Words

opioid abuse, opioid monitoring programs, opioid use, potential for opioid abuse

Introduction

In 2017, more than 72,000 Americans died from drug overdoses, which is equivalent to almost 200 deaths each day ^[1]. However, 66% of these deaths were linked to opioids ^[2]. The prescription has dramatically increased as the number of prescription pain relievers dispensed in 2015 was three times the number prescribed in 1999. Approximately 500,000 individuals may die from opioid overdoses in the next 10 years ^[2].

In addition to the health consequences resulting directly from the use of prescription opioids, the consumption of prescription opioids may contribute to a patient's use and abuse of illegal opioids such as heroin ^[3]. A 2014 study found 75% of people in treatment for heroin use had started with painkillers ^[3]. The increase in heroin use and migration to a new class of users appears to be due to the coincidental increase in the abuse of prescription opioids over the last 20 years ^[3]. Given that prescription opioids are legal, many users have viewed these drugs as safer to use than illicit substances ^[3]. For instance, the Scheduled Prescription Electronic Collection and Tracking (INSPECT) program, which is a drug monitoring program, has now been in place for years and allows providers to access information concerning the date and time patients receive a controlled substance, as well as the quantity of the substance. In 2011, approximately 53% of providers were using the program and were able to determine prescription opioid abuse continued ^[4,5]. Tools such as the INSPECT program are critical for monitoring the prescription of opioids in order to prevent their abuse.

The Controlled Substance Act (CSA) identifies drugs and other substances as controlled substances. Substances are assigned to specific schedules based on their degree of relative abuse potential, their status as a currently accepted medical treatment in the United States, and their likelihood of causing dependence when abused ^[6]. Schedule II controlled substances such as the opioid analgesic hydrocodone have a high potential for abuse, which may lead to physical dependence or severe psychological dependence ^[6]. Of 1.4 million ER visits, 420,040 were due to opioid analgesics ^[7]. Approximately, 64% of the public reports being prescribed an opioid for pain ^[8]. However, since more than 11 million Americans misused prescription opioids in 2016, and deaths related to opioids had quadrupled since 1999, President Donald Trump identified the prescription opioid epidemic as a "public health emergency" ^[8]. However, some types of prescribed opioids are among the most common causes of substance-related deaths. In the state of Washington, the opioid methadone was the leading cause of death due to substance poisoning between the years 2003 and 2010; however, oxycodone, morphine, and hydrocodone were the fifth, seventh, and ninth leading cause of death, respectively ^[9].

Demographic Factors and Opioid Use

Overdoses and deaths related to prescription opioids represent a public health crisis for the American population. However, the impact of prescription opioids may vary by gender, race, and age. In terms of gender, Choo, Douriez, and Green report that among patients seen in the emergency department (ED), females were most commonly prescribed acetaminophen with hydrocodone followed by oxycodone, whereas males were most commonly prescribed oxycodone followed by acetaminophen with hydrocodone ^[10]. However, males and females were equally likely to be seen in the ED for misuse of opioids alone, with differences only apparent in the type of substances used in combination with opioids ^[10]. Other researchers also report differences between

males and females in terms of the use, abuse, and mortality related to the ingestion of prescription opioids alone. For instance, Back et al., (2011) indicate that among adults being treated for short-term opioid addiction, women were more likely than men to report opioid cravings, but men were significantly more likely to have a positive result for methadone in a urine toxicology screening ^[11]. Kaplovich et al. reported that among patients receiving chronic opioid therapy, men were significantly more likely to elevate their treatment to high doses of opioids; additionally, the mortality rate of men from opioid-related deaths was two times higher than the rate of women ^[12].

While differences in health consequences related to the use of opioids exist between males and females, differences in the prescription of opioids by patients' race have been observed. Based on their analysis of data collected through the 1997-1999 *National Hospital Ambulatory Medical Care Surveys*, Tamayo-Sarver, Hinze, Cydulka, and Baker found that non-Hispanic White patients were significantly more likely to be prescribed opioids for the treatment of migraines while in the emergency department ^[13]. However, from their analysis of the more recent 2007-2011 *National Hospital Ambulatory Medical Care Surveys*, Singhal, Tien, and Hsia reported non-Hispanic White patients were significantly more likely than non-Hispanic Black patients to be treated with opioids for abdominal pain and back pain ^[14]. They also indicated that upon discharge from the ED, non-Hispanic White patients were also more likely than non-Hispanic Black patients to be prescribed opioids for back pain and were more likely than any other race and ethnicity to be prescribed opioids for abdominal pain ^[14].

While differences between non-Hispanic White patients and non-Hispanic Black patients have been observed in terms of being prescribed opioids, Ringwalt, Roberts, Gugelmann, and Skinner reported non-Hispanic Black Medicare beneficiaries with chronic non-cancer pain (CNCP) were significantly less likely than non-Hispanic White CNCP Medicare beneficiaries to fill a prescription for opioids ^[15]. However, these differences in prescription fulfillment were most pronounced when the opioids were prescribed by dentists, general practitioners/family medicine physicians, orthopedic surgeons, obstetricians/gynecologists, and other unspecified specialists ^[15].

In addition to gender and race/ethnicity, the factor of age also contributes to the use and abuse of opioids. Emergency department visits related to opioids were highest for older teenagers and young adults and significantly increased for those individuals aged 55 and older ^[16]. In a study conducted by Fiellin, Tetrault, Becker, Fiellin, and Hoff, approximately 12 percent of young adults between the ages of 18 and 25 were reported to be current abusers of prescription opioids ^[17]. The researchers also reported that among males, patients 18 to 34 years of age were significantly more likely than patients 35 and older to abuse prescription opioids ^[17]. However, young adults are not alone in their susceptibility to opioid use. Between the years 2004 and 2009, the number of young children between the ages of one and five years visiting the ER due to accidental opioid ingestion increased by 200 percent ^[18]. In terms of the ingestion of specific types of opioids, Ossiander found that the highest death rates due to overdoses of methadone and oxycodone (taken separately) occurred between the ages of 40 and 49 ^[9].

Opioids in the State of Indiana

Between the years 2012 and 2016, the state of Indiana had the third highest mortality rate due to drug overdose ^[19]. However, opioids were ingested by 63 percent of those Indiana residents who died of drug overdose ^[19].

While the 2016 overdose-related death rate (12.6 deaths per 100,000) for the state of Indiana was less than that of the national rate (13.3 per 100,000), the increasing number of deaths related to opioid overdose during the past decade is a significant concern ^[20]. In Indiana, the death rate due to opioid overdose increased five times between the years 1999 and 2015 ^[21]. Because of the trend in deaths related to opioid overdose within the state of Indiana, it is critical to focus on the prescription of opioids by health providers.

Thus, for the current study, the researchers focused on the prescription of various types of opioids among patients at Daviess Community Hospital in the rural community of Washington, Indiana. As of 2016, the town of Washington, Indiana had a population of 12,089, and 89 percent of the population was non-Hispanic White. Each year, the hospital emergency department evaluates approximately 14,000 patients annually. In 2017 (from which data were collected), the Daviess Community Hospital Emergency Room evaluated 13,797 patients. Given the contributions of demographic factors in the prescription and abuse of opioids ^[10,18] and varying risks associated with different types of opioids ^[9], the researchers of the current study sought to determine the distribution of various types of opioids by gender, race, and age among patients treated at Daviess Community Hospital Emergency Room in Washington, Indiana.

Methods

After obtaining approval from the Institutional Review Board (IRB) of Oceania University of Medicine, the researcher obtained informed consent from patients of Daviess Community Hospital in Washington, Indiana. Patients' consent forms were signed and placed in files at the hospital. A descriptive design was used for the current study.

Patients seen at the Emergency Department at Daviess Community Hospital taking a routine prescription opioid narcotic were included in the current study. This sample included patients age 16 or older of any ethnicity or gender who were routinely on a prescription opioid narcotic and a long-term user (minimum of 90 days) of an opioid narcotic.

The patients' medications were recorded upon entrance into the emergency department. Documentation of patients' age, race, and gender were also recorded and verified at ER visit check-in. The primary researcher also took note of the type of opioid narcotic each patient was prescribed. The documentation was then stored as a secure electronic medical record.

The current study was of a descriptive design. Thus, frequencies and percentages were used to summarize the sample by demographic characteristics as well as by type of opioids prescribed ^[21]. IBM SPSS Version 25 was used to analyze the data collected from the charts of participants ^[21].

Results

Of the one hundred patients included in the current study, a higher percentage (59.0%) was female. In terms of race, the highest percentage was non-Hispanic White (95.0%) with approximately equal percentages of Hispanic

and non-Hispanic Black patients. In terms of age group, the highest percentages of patients were 54 to 64 years of age (22.0%), closely followed by 43 to 53 years (21.0%). The lowest percentage (6.0%) of patients were in the youngest age group of 21 to 31 years of age. The complete distribution of the sample by gender, race, and age group is provided in Table 1.

Table 1
Distribution of Sample (N = 100) by gender, race, and age group

Characteristic	n	%
Gender		
Female	59	59.0
Male	41	41.0
Race		
White, non-Hispanic	95	95.0
Black, non-Hispanic	2	2.0
Hispanic	3	3.0
Age Group		
21 to 31	6	6.0
32 to 42	13	13.0
43 to 53	21	21.0
54 to 64	22	22.0
65 to 75	13	13.0
76 to 86	15	15.0
87 and older	10	10.0

For the current study, the researchers sought to determine the distribution of type of opioids prescribed by gender, race/ethnicity, and age group of the patient. The highest percentage of both females (58.2%) and males (58.5%) were prescribed hydrocodone. However, while the second highest percentage (22.0%) of females were prescribed Tramadol, the second highest percentage of males (26.83) were prescribed Percocet. None of the males in the sample were prescribed Fioricet or methadone (Table 2).

Table 2
Distribution of prescribed opioids by gender.

Prescribed opioid	Females (n = 59)		Males (n = 41)	
	n	%	n	%
Hydrocodone	32	54.2	24	58.5
Fioricet	1	1.7	0	0.0
Methadone	3	5.1	0	0.00
Morphine	1	1.7	1	2.4
Percocet	9	15.3	11	26.8

Tramadol	13	22.0	5	12.2
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In terms of race/ethnicity, the highest percentages of non-Hispanic Black (50.0%), non-Hispanic White (55.8%), and Hispanic (66.7%) patients were prescribed hydrocodone (Table 3). For non-Hispanic Black patients, the only other patient in the current study was prescribed Percocet. However, the remaining Hispanic patient was prescribed Tramadol. For non-Hispanic White patients, Percocet was the second most common opioid prescribed (20.0%) while Tramadol was the third most common opioid prescribed (17.9%). However, it should be noted that 95 percent of the sample identified themselves as non-Hispanic White patients (Table 3).

Table 3

Distribution of type of prescribed opioids by race/ethnicity of patients (N = 100).

Prescribed Opioid	Non-Hispanic, Black (n = 2)		Non-Hispanic, White (n = 95)		Hispanic (n = 3)	
	n	%	n	%	n	%
Fioricet	0	0.0	1	1.10	0	0.0
Hydrocodone	1	50.0	53	55.8	2	66.7
Methadone	0	0.0	3	3.2	0	0.0
Morphine	0	0.0	2	2.1	0	0.0
Percocet	1	50.0	19	20.0	0	0.0
Tramadol	0	0.00	17	17.9	1	18.0

In terms of the distribution of prescribed opioid type by age group, hydrocodone was the most commonly prescribed opioid for all age groups, except for patients between 43 and 53 years of age (Table 4). The highest percentage (47.6%) of patients between the ages of 43 and 53 years of age was prescribed Percocet. While hydrocodone was the second most commonly prescribed opioid (38.1%) for patients between the ages of 43 and 53, Tramadol was the second most commonly prescribed opioid for patients in most of the age groups. In general, the least most commonly prescribed opioids were Fioricet and Morphine (Table 4).

Table 4

Distribution of type of opioids prescribed by age group (N = 100)

Age (years)	21 – 31		32 - 42		43 –53		54 – 64		65 – 75		76 and older (n = 25)	
	(n = 6)		(n = 13)		(n = 21)		(n = 22)		(n = 13)			
	n	%	n	%	n	%	n	%	n	%	n	%
Prescribed opioid												
Fioricet	0	0.0	1	7.7	0	0.0	0	0.0	0	0.0	0	0.0
Hydrocodone	3	50.0	7	53.8	8	38.1	14	63.6	12	92.3	12	48.0
Methadone	0	0.0	0	0.0	2	9.5	1	4.5	0	0.0	0	0.0

Morphine	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	4.0
Percocet	1	16.7	2	15.4	10	47.6	3	13.6	0	0.0	4	16.0
Tramadol	2	33.3	3	23.1	1	4.8	3	13.6	1	7.7	8	32.0

Discussion

In 2017, the Indiana State Department of Health reported the death rate related to drug overdose in Daviess County, Indiana was 12.13 per 100,000 residents [22]. While this current death rate may not seem as significant as death rates in other counties or regions of the United States, Indiana’s increasing trend of deaths due to opioid overdose [20,21] dictates the need to assess the types of opioids prescribed at health facilities within the state. Additionally, the potential for abuse, hospitalization, and death related to opioids for different segments of the population [10,18] contributed to the examination of various types of opioids prescribed by gender, race, and age among patients treated at Daviess Community Hospital Emergency Room in Washington, Indiana. Participants in the current study were routinely prescribed the indicated opioid narcotics including Schedule II controlled substances [6] and had been taking them for at least 90 days or longer.

Across the examined demographic variables of gender, race, and age, hydrocodone was the most commonly prescribed narcotic among the sample of patients from Daviess Community Hospital. This is consistent with the recognition of hydrocodone as being an effective analgesic [6]. Additionally, the more common prescription of hydrocodone compared to methadone, oxycodone (which is contained in Percocet), and morphine is consistent with the stronger association of methadone, oxycodone, and morphine with drug-related deaths [9].

Although a higher percentage (59%) of study participants was female, hydrocodone was the most frequently prescribed opioid for both males and females. This finding was consistent with the findings of Choo, Douriez, and Green, who identified acetaminophen with hydrocodone as the most commonly prescribed opioid among females at the Daviess ED [10]. While Choo, Douriez, and Green reported acetaminophen with hydrocodone was only the second most commonly prescribed opioid for male patients seen at the ED, they did report oxycodone was the most commonly prescribed opioid for the male patients [10]. This is consistent with Percocet, a combination opioid containing oxycodone and acetaminophen, being identified as the second most commonly prescribed opioid for male patients, but not female patients, in the current study.

As previously indicated, non-Hispanic White patients comprised 95 percent of the sample of Daviess Community Hospital patients in the current study. This overrepresentation of non-Hispanic White patients in the sample created a challenge in comparing the prescription of specific types of opioids to non-Hispanic Black, non-Hispanic White, and Hispanic patients. However, patients were only eligible for the current study if they had been routinely prescribed opioid narcotics and had been taking them for at least 90 days or longer. Although the majority of the residents of Washington, Indiana (the location of Daviess Community Hospital) are non-Hispanic White, the high representation of non-Hispanic White patients may also reflect the higher frequency with which non-Hispanic White patients are prescribed opioids for the treatment of pain [13,14].

When examining the prescription of specific types of opioids by age group, hydrocodone was the most commonly prescribed opioid for patients of all age groups except for those between the ages of 43 and 53 years. For the patients between 43 and 53 years of age, the most commonly prescribed opioid was Percocet. Ossiander found that the highest prevalence of deaths related to oxycodone-related overdose occurred among patients (including both males and females) between the ages of 40 and 49^[9]. However, when only examining females, the highest prevalence of deaths related to oxycodone-related overdose occurred between the ages of 50 and 59^[9]. Furthermore, Fox, Hoffman, Vlahov, and Manini reported that among patients seen at two urban ED's for opioid overdose, the highest percentage (40.4%) had overdosed either with oxycodone alone or with oxycodone used with another substance^[24]. Of the six patients who died in the hospital during Fox et al.'s study, oxycodone was involved with four of these patients^[24]. The mean age of Fox et al.'s study was 44.7 years^[24]. Thus, the high percentage (47.6%) of patients in the current study who were between ages 43 and 53 years and prescribed Percocet may be consistent with the extensive involvement of oxycodone in the patients presenting with opioid overdose in Fox et al.'s study^[24].

While the findings of the current study contribute to the literature concerning the prescription of specific types of opioids by gender, race, and age, several limitations must be noted. While collected data provided information concerning the type of opioid prescribed, information concerning patients' diagnoses and the dosage of prescribed opioids were not provided. This information would provide context (e.g. pain level, appropriateness of dosage) for the prescription of the specific opioids. Furthermore, considering the potential for abuse of and dependence on the types of opioids examined in the current study, an assessment of the prescribing health providers' knowledge, perceptions, and attitudes concerning the opioids they prescribed would also provide context for their opioid prescription practices. Finally, in the collection of data for the demographic variables of gender, age, and race, there was underrepresentation of specific groups. This underrepresentation is most pronounced in the analysis of the data for the variable of race/ethnicity. As previously indicated, the underrepresentation of various groups did not allow for an equitable comparison of opioid prescription between groups. Additionally, the number of empty cells in the frequency tables created unfavorable conditions for testing for a statistically significant association between the demographic variables with a Chi-square test of independence. Thus, when determining if there is an association between demographic variables and the prescription of specific opioids, future researchers must ensure the number of participants in each group allows for a more equitable comparison.

Conclusion

In the current study, opioids such as hydrocodone and oxycodone (Percocet) were determined to be commonly prescribed to Daviess Community Hospital patients seen at the Emergency Room. While these opioids have served as effective treatment options for pain, they also have a high potential for abuse and have been identified as being ingested in an increasing number of cases of substance-related overdose. In an effort to prevent opioid-related cases of substance abuse and overdose, the state of Indiana, which is the location of the current study, has implemented the Indiana Prescription Monitoring Program, which allows medical professionals to track the use of controlled substances throughout the state^[25]. However, while such tools allow professionals to monitor prescription drug use and abuse, many health providers either are not aware of these

tools or do not know how to use them ^[26,27]. Thus, there is an urgent need to educate health providers concerning the use of these tools. By the same token, there is a need for health providers and all public health professionals to inform patients and their families, as well as their communities, about the potential consequences of opioid use, abuse, and dependence. In addition to the determination of morbidity and mortality rates of opioid use, more research must be conducted concerning education of the perceptions and opioid prescription practices of health providers. Findings of the current study may serve as a steppingstone for future opioid prescription studies, specifically in rural Indiana community health facilities such as Daviess Community Hospital. It is also the researchers' hope that the current study increases awareness of the needs of underserved population segments in rural Indiana. In this way, health professionals and all public health professionals can truly promote healthy and safe communities.

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