Original Research

WALDEN UNIVERSITY

Predictors of Prescription Opioid Misuse Based on Type of Healthcare Insurance

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Abstract

The misuse and abuse of prescription opioid (PO) medications has garnered the attention of lawmakers, healthcare professionals, and public health experts since the opioid epidemic was declared a national public health emergency in 2017. Our purpose in this study was to investigate the types of healthcare insurance that predict PO misuse. We also sought to inform stakeholders of potentially needed changes to the existing inconsistent drug utilization rules necessary to achieve parity among all types of healthcare insurance and minimize loopholes. We performed a secondary data analysis on the 2019 National Survey on Drug Use and Health data of noninstitutionalized U.S. citizens aged 12 years and older and used a binary logistic regression analysis to evaluate the data. Medicare beneficiaries were 1.79 times more likely and those who had private healthcare insurance through an employer or union were 1.68 times more likely (95% CI [1.025, 3.141] and [1.148, 2.463], respectively) than respondents with other healthcare insurances to use PO longer or in greater amounts than the prescription intended. Respondents who had Medicare were 2.226 times more likely than respondents with other healthcare insurance (95% CI [1.029, 4.989]) to misuse PO by taking the medications longer and for other reasons not specified. Our study demonstrates that the type of healthcare insurance is a predictor of PO misuse. Our research also emphasizes the need for stakeholders to use evidence-based research to ensure parity among insurances.

Recommended Citation

Introduction

Approximately 12 million people in the United States misused prescription opioids (PO) in 2017 (Jalali et al., 2020); more than 47,000 individuals died from opioid-related incidents in the same year (Jalali et al., 2020). The salient data indicate that opioid-related deaths and the rise of the opioid epidemic were correlated to a lack of regulated rules at the local, community, and government levels (Jalali et al., 2020). Misuse is defined

as taking PO in any manner or for any purpose other than the original intention of its prescription (SAMSHA, n.d.). Previous researchers considered quantity dispensing and related sociodemographic variables to be causal factors (Schieber et al., 2020); additional research supported claims that the lack of healthcare insurance parity negatively contributed to the ongoing opioid epidemic (Blake, 2019). Notwithstanding, Jalali et al. (2020) posited that a multidimensional problem caused the opioid epidemic, which requires local, state, and federal contributions to mitigate the death and overdose rates.

After the proliferated prescribing practices of PO and after the opioid epidemic was declared a public health crisis, healthcare insurance companies were charged with increasing surveillance and establishing a system for managing the number of prescriptions dispensed (Lin et al., 2018). However, many healthcare insurance companies did not use evidenced-based practices for controlling the dispensation of PO medication (Lin et al., 2018). These noticeable differences in drug utilization management rules for dispensing PO among various types of insurance may have contributed to loopholes in the system (Jalali et al., 2020; Reinhardt, 2020). These potential loopholes have led to lawmakers recognizing the need for parity among healthcare insurance companies, which led, in part, to the creation of the *Patient Protection and Affordable Care Act*, to mitigate adverse effects of PO being misused (Blake, 2019). Achieving parity among various types of healthcare insurance would standardize drug utilization review standards when approving quantities, frequencies of use, days-supply, and classifications of tiers related to PO across all types of insurance, thereby eradicating the disparity among healthcare insurance types and providing greater access to treatment (see Blake, 2019).

Public health professionals actively engage in mitigating the opioid epidemic through local, state, and federal laws (Jalali et al., 2020; Salmon & Allread, 2019). The Affordable Care Act established some form of parity through uniform coverage of preventative measures, including using a prescription drug monitoring program and coverage of substance use disorders, but it failed to address prescription authorization parameters among private insurers as it did for Medicaid (Blake, 2019). There is a lack of equality and equity among individuals of all socioeconomic and demographic backgrounds due to lack of policy and less than adequate comprehensive healthcare insurance benefits (Trepman et al., 2020). Former restrictive formularies related to PO may have contributed to variations in opioid utilization (Jayawardhana et al., 2018b).

Jayawardhana et al. (2018b) established reasonable predictor variables for Georgia Medicaid patients, although there are no assumptions that these variables cross over into private and other commercial healthcare insurances (Jayawardhana et al., 2018b). Some healthcare insurance companies cover withdrawal conditions such as hyperkatifeia (Blake, 2019; Coussen et al., 2019). Even though there have been many concerted efforts to eradicate or mitigate the total opioid epidemic, the crisis continues to worsen to date (Salmon & Allread, 2019). Biologically, patients are building a higher tolerance of fatal levels of opioid medication, more potent opioids are being manufactured, and prescription and synthetic opioids have begun to cross U.S. borders (Salmond & Allread, 2019). Salmond and Allread (2019) stated that considerable research is needed in a population health approach.

The literature has propounded the idea that PO misuse costs the United States an estimated $1,021 billion in 2017 with an average of $221,219 per opioid use disorder case (Luo et al., 2021). Although healthcare insurance companies have attempted to find alternate and more cost-effective treatments for PO (Blake, 2019), these prevention strategies do not help victims currently addicted to PO (Blake, 2019). In fact, patients who misuse PO increase the healthcare system's debt nearly eight times the amount of those patients who use PO as directed (Cochran et al., 2014).

Purpose of the Study

Our purpose in this study was to identify and examine the various types of healthcare insurance that predict PO misuse and inform stakeholders of potential changes needed to the existing inconsistent drug utilization

rules in order to move closer to achieving parity among all types of healthcare insurance and minimize loopholes. Previous studies have identified sociodemographic variables that predict PO misuse or contribute to opioid use disorder (Jayawardhana et al., 2018b); therefore, our study expounds on the literature to add purposive research about the effect types of healthcare insurance have on PO misuse.

Research Question

RQ1: What sociodemographic factors predict prescription opioid misuse controlling for the type of healthcare insurance?

Methods

We used a quantitative research approach whereby a secondary data analysis was conducted on an existing dataset. The data included in this study were voluntarily collected from subjects who participated in the 2019 version of the National Survey on Drug Use and Health (NSDUH). A total of 67,625 interviews comprised the final sample, and a response rate of 70.50% was achieved by the NSDUH. Our study focused on the population of citizens across the United States who were stratified by education (some or no high school or high school graduate and beyond) and healthcare insurance (have insurance or no insurance). This sample exhibited a fair representation of the U.S. population. It further provided a fair representation of those U.S. citizens who used or misused PO versus those who did not.

To participate in the 2019 NSDUH survey, participants were required to be at least 12 years of age and noninstitutionalized (SAMSHA, n.d.). Individuals meeting these criteria were further scrutinized to include those patients who were prescribed and misused PO medications. The target population was required to meet explicit inclusion criteria to be considered. Using the computer-based survey provided by NSDUH and its field assistants, subjects used in our survey were asked about their willingness to participate and to provide honest and accurate responses concerning sensitive topics such as drug use, abuse, and other behavior. Inclusion criteria for the sample population included individuals who were 12 years or older and who were noninstitutionalized. Additional criteria included subjects who self-reported having used or misused PO. Respondents who endorsed use of any PO were then asked about misuse. For those respondents who acknowledged misuse of any PO, they were then asked detailed questions about the specific type of misuse (e.g., used longer than doctor prescribed, used because of being hooked, lack of sleep, experimentation, or other reasons). Supplementary solicited information included age, sex, race, and healthcare insurance type or types in the case of multiple insureds. Table 1 summarizes prescription opioid use and misuse by category.

Table 1. *Prescription Opioid Use and Misuse by Category*

Variable	N	%
History of PO use ever		
No	27,302	48.64
Yes	28,368	50.53
Other	466	0.83
Type of PO misuse		
Used OxyContin not directed by doctor, past 12 months		
No	291	48.8
Yes	305	51.2
Used pain reliever without own Rx, past 12 months		
No	760	37.0
Yes	1,292	63.0

Used pain reliever in greater amounts than Rx, past 12 months

No	1,680	81.9
Yes	372	18.1

Used pain reliever more often than Rx, past 12 months

No	1,790	87.2
Yes	262	12.8

Used pain reliever longer than Rx, past 12 months

No	1,811	88.3
Yes	241	11.7

Used pain reliever in other way not directed, past 12 months

No	1,547	75.4
Yes	505	24.6

Used last pain reliever (not directed) to relieve pain

No	668	31.6
Yes	1,447	68.4

Used last pain reliever (not directed) to relax

No	1,575	74.5
Yes	540	25.5

Used last pain reliever (not directed) to experiment

No	1,961	92.7
Yes	154	7.3

Used last pain reliever (not directed) to get high

No	1,644	77.7
Yes	471	22.3

Used last pain reliever (not directed) for sleep

No	1,772	83.8
Yes	343	16.2

Used last pain reliever (not directed) for emotions

No	1,853	87.6
Yes	262	12.4

Used last pain reliever (not directed) for other drug effect

No	2,053	97.1
Yes	62	2.9

Used last pain reliever (not directed) because hooked

No	2,042	96.5
Yes	73	3.5

Used last pain reliever (not directed) for other reason

No	2,026	95.8
Yes	89	4.2

Note. Respondents were individually asked about each misuse category. A respondent having answered yes in one category does not exclude them from answering yes in subsequent categories. This allowed for overlap in several category among misuse.

In the 2019 NSDUH study, 67,625 subjects responded to the survey and of them, 28,368 individuals used PO medications. For our study, age was categorized as the following: 12–13 years, 14–15 years, 16–17 years, 18–20 years, 21–25 years, 26–34 years, and 35 years or older, respectively. The racial makeup of the study sample was Hispanic, White, Asian, Black, or multiracial. Gender was classified only as male or female. Although the NSDUH survey asked questions about several types of drugs (pain relievers, tranquilizers, stimulants, and sedatives), our study only focused on medication authorized for pain relief (specifically, opioids).

Results

The age groups of this population were primarily 21–25 years old (15.78%) or 26–34 years old (15.32%). Gender was reasonably evenly distributed with the number of males slightly higher (50.4%) than females (49.6%). Race and ethnicity categories were primarily dominated by non-Hispanic White (57.2%), Hispanic (19.3%), non-Hispanic Black/African American (12.9%), Asian (4.8%), multiracial (3.9%), non-Hispanic Native American/Alaskan Native (1.3%), and non-Hispanic/Other Pacific Islander (0.5%). Fewer than one-fourth of the participants had a high school diploma or equivalent (23.4%); whereas 25.4% had some college credit but did not obtain a degree and 24% graduated from college or higher. Pertaining to total income, 44.8% of participants made less than $10,000, and about one-fourth made between $10,000 and $29,999 (24.2%). Finally, participants' healthcare insurance was classified as Medicare, Medicaid/CHIP, Military (which included Tricare, CHAMPUS, CHAMPVA, VA, and military care), private plans through an employer or union, or private insurance. More participants were covered under private plans (n = 34,070) and private plans through an employer or union (n = 30,301) than any other healthcare insurance plan.

We performed logistic regression analysis on independent variables and the combined subcategories: *Used pain relievers (not as directed) longer than Rx* and *Used pain relievers in greater amounts than Rx past 12 months,* where the relationship to healthcare insurance was found to be statistically significant. As Table 2 demonstrates, those participants who had Medicare were 1.79 times more likely (95% CI [1.025, 3.141]) than participants who had any other healthcare insurance to use PO not directed by a physician longer than the prescription originally intended. Those who had private healthcare insurance through an employer or union were 1.68 times more likely (95% CI [1.148, 2.463]) to use PO not directed by a physician in greater amounts than the prescription originally intended. Healthcare insurance was a statistically significant predictor of participants who used PO longer than directed combined with using it for other reasons. We found that those respondents who had Medicare were 2.266 times more likely to misuse PO by taking them longer and for other reasons not specified than any respondents who had any other healthcare insurance (95% CI [1.029, 4.989]), as presented in Table 2.

We performed binary logistic regression for independent variables and the combined subcategories: *Used pain reliever (not directed) for other reason* and *Used pain reliever (not directed) in greater amount,* where healthcare insurance was found to be statistically significant. Of the several types of healthcare insurance plans, Medicare recipients were 1.911 times (95% CI [1.023, 3.571]) more likely than respondents who did not have Medicare to engage in these types of combined opioid misuse. Those participants who had private insurance through an employer or union were 1.699 times (95% CI [1.130, 2.553]) more likely to engage in these types of combined opioid misuse than respondents who had any other healthcare insurance plans. Binary logistic regression analyses are presented in Table 2.

Table 2. *Binary Logistic Regression Analyses Independent Variables and Types of Prescription Opioid Misuse*

| | | | | | | | 95% C.I. for Exp(B) | |
Characteristic	B	S.E.	Wald	*df*	Sig.	Exp(B)	Lower	Upper
			Used longer/Used in greater amounts					
Healthcare insurance								
Medicare	.585	.286	4.188	1	.041	1.794	1.025	3.141
Private plan through employer or union	.520	.195	7.115	1	.008	1.681	1.148	2.463
			Used longer/Used for other reason					
Healthcare insurance								
Medicare	.818	.403	4.122	1	.042	2.266	1.029	4.989
			Used for other reason/Used in greater amount					
Healthcare insurance								
Medicare	.648	.319	4.124	1	.042	1.911	1.023	3.571
Private plan through employer or union	.530	.208	6.500	1	.011	1.699	1.130	2.553

Note. The statistically significant data that support the findings of our study have been reported in this table. To preserve the length and clarity of this document, only salient data are reported, but are available from the author, KG, upon reasonable request.

Discussion

Our study sought to understand how types of healthcare insurance affect PO misuse among a nationally representative sample of U.S. citizens. Binary logistic regression supported claims that the type of healthcare insurance was a predictor of PO misuse. Individuals with Medicare or private healthcare insurance through employers or a union were more likely to be PO misusers. Additionally, Medicare beneficiaries were 1.9 times more likely than patients who had any other healthcare insurance type to use PO for other reasons and in a greater amount compared with beneficiaries of any other insurance type and were 2.26 times more likely to use them longer and for other reasons combined. Similarly, patients covered by a private healthcare insurance plan through their employer or union were 1.6 times more likely to use more PO tablets combined with using PO for other unspecified reasons. The study by Sullivan et al. (2010) elucidated the role of healthcare insurance and its relationship with opioid abuse. Of those individuals who were commercially insured, 24% were likely to use PO in ways not directed by the physician or not intended by the prescription (Sullivan, 2010). Similarly, 20% of Medicaid patients and about 13% of the privately covered insureds fall into this classification as well (Sullivan, 2010).

The results of our study indicated that, despite previous efforts to mitigate or eradicate the opioid epidemic, there is still a need to address the epidemic from an interdisciplinary approach. Despite efforts documented in the literature, there was still an undesirable number of victims who succumbed to misuse of PO each day (Jawardhana et al., 2018a). There is a need to make considerable strides toward mitigating opioid-related hospital visits and deaths by considering other nonlinear factors, including prescribing techniques and insurance coverages (Jawardhana et al., 2018a). From our study, we realized that there are differences between those healthcare insurance companies that contribute to PO misuse and those that do not. Although issues of parity among types of healthcare insurance were reviewed under the Patient Protection and Affordable Care Act, this review did little to address parity or to standardize rules related to opioid misuse for private insurers (Blake, 2019). Thus, parity among healthcare insurance companies should be reevaluated and should have federal standards and benchmarks for drug utilization review for all commercial and private

insurance companies. Using standard and uniform drug utilization approval procedures may prove to eliminate the disparity observed between Medicare and private healthcare insurance companies. Prada and Loaiza (2019) stated that there was a lack of methodological consistency among regulations for state-run Medicaid programs.

Finally, we acknowledge that there may be little clinical significance and few adverse effects between taking a PO not as originally intended under the direction of the physician or with permission from the physician. We further recognize that physicians have wide latitude when prescribing PO (see *Ruan vs. United States*, 2022); however, there is a need to build and utilize a robust prescriber-patient education program specific to opioid use and misuse (Jayawardhana et al., 2028b). PO misuse surveillance programs could prove to be beneficial, provided real-time tracking is available at the national level through local regions within a state. This would allow unique and targeted resources to be utilized to educate, reinforce, and provide access to care for specific regions based on needs instead of utilizing a national intervention strategy.

As is common with the use of an existing dataset, our study had several limitations, including imputed data that had the potential to negatively impact the power calculation. Further, since the NSDUH used computer-assisted surveys, respondents were limited to selecting from the available options on the computer and may have not felt comfortable submitting truthful answers to some sensitive questions. Due to the algorithm of the computer-assisted survey, it is possible that a single person was represented multiple times in striated data used in this analysis. We further acknowledge the phenomenon of survey fatigue as an issue since this survey included several topics. Since the data were self-reported, we acknowledge possible recall bias related to some questions asking respondents to recall behavior for up to 1 year. Further, there may have been underreporting due to the stigma associated with the use of opioids.

Conclusion

The implications from our study indicate that policies for professional practice are needed among healthcare insurance companies. Although most healthcare insurance companies have a drug utilization review department that regulates what medication is approved for use and under what circumstances, there appears to be a lack of consistency among healthcare insurance companies that varies, further, from state to state (Blake, 2019). Our study confirmed that there is an increased likelihood of misusing PO based on the type of healthcare insurance an individual has. However, other healthcare insurance companies demonstrate greater compliance of PO use among their insureds. An interdisciplinary approach should be used to evaluate parity among all healthcare insurance companies on a federal level. This would minimize the number of loopholes patients can use to bypass one healthcare insurance carrier to use a subsequent healthcare insurance with less PO oversight.

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