2018

Prescription Medication Misuse Among American Indians in the Midwestern US

Charley S. Lewis , *University of Kansas Medical Center*, clewis4@kumc.edu

Jordyn Gunville , *University of Kansas Medical Center*, gunville@kumc.edu

Ryan Goeckner , *University of Kansas Medical Center*, r334g297@kumc.edu

See next page for additional authors

Recommended Citation

Prescription Medication Misuse Among American Indians in the Midwestern US

Abstract

Background: Prescription medications, particularly opioids, are often abused rather than used as intended by the prescribing physician. This is well-documented, though little data are available on American Indians. Misuse of other prescription medications is far less documented, but does occur and can have wide-spread effects.

Methods: We used a cross-sectional survey of American Indians in the Midwestern US (N=361) to begin to understand misuse of prescription medications, not necessarily to get high, but for any reason. Participants were recruited for this touchscreen computer-based survey at powwows, health fairs, and other community events through a convenience sample. We asked questions about sharing medication, as well as whether or not an individual finished a prescribed run of antibiotics. We asked about sharing prescription allergy medicine, antacids, antibiotics, pain relievers, water pills (diuretics), medicines for asthma, blood pressure, high cholesterol, diabetes, epilepsy, or heart disease, or other. We used stepwise logistic regression to determine the demographic variables most predictive of taking someone else's medication.

Results: Over one-third of participants in this survey (33.8%) confessed to having taken medication prescribed for someone else. The medications individuals most commonly took from someone else were pain relievers (23.6%) and antibiotics (22.0%). The medications most commonly given to someone else were similar, but changed in order, with antibiotics at 21.4% and pain relievers at 15.9%. The factors most predictive of sharing prescription medications were having grown up on a reservation (p=0.012), reporting poor health status (p=0.013), and not having seen a provider in the past year (p=0.074).

Conclusions: This is an area of research that warrants further study, particularly antibiotic misuse. The literature on pain reliever misuse expands daily, but there are dramatic effects to the larger population with the misuse of antibiotics. Interventions are necessary for American Indian communities and others to target all prescription medication misuse.

Keywords

Cover Page Footnote

Authors

Charley S. Lewis, Jordyn Gunville, Ryan Goeckner, Brian Chase, Lauren Clark, Jianghua He, Won S. Choi, and Christine M. Daley

Prescription Medication Misuse Among American Indians in the Midwestern US

Charley S. Lewis, MPH, University of Kansas Medical Center
Jordyn Gunville, MPH, University of Kansas Medical Center
Ryan T. Goeckner, MA, University of Kansas Medical Center
Brian Chase, MS, MEng, University of Kansas Medical Center
Lauren Clark, MS, University of Kansas Medical Center
Jianghua He, PhD, University of Kansas Medical Center
Won S. Choi, PhD, MPH, University of Kansas Medical Center
Christine M. Daley, PhD, MA, SM, University of Kansas Medical Center
Corresponding Author: Charley S. Lewis, MPH, clewis4@kumc.edu

ABSTRACT

Background: Prescription medications, particularly opioids, are often abused rather than used as intended by the prescribing physician. This is well-documented, though little data are available on American Indians. Misuse of other prescription medications is far less documented, but does occur and can have wide-spread effects.

Methods: We used a cross-sectional survey of American Indians in the Midwestern US (N=361) to begin to understand misuse of prescription medications, not necessarily to get high, but for any reason. Participants were recruited for this touchscreen computer-based survey at powwows, health fairs, and other community events through a convenience sample. We asked questions about sharing medication, as well as whether or not an individual finished a prescribed run of antibiotics. We asked about sharing prescription allergy medicine, antacids, antibiotics, pain relievers, water pills (diuretics), medicines for asthma, blood pressure, high cholesterol, diabetes, epilepsy, or heart disease, or other. We used stepwise logistic regression to determine the demographic variables most predictive of taking someone else's medication.

Results: Over one-third of participants in this survey (33.8%) confessed to having taken medication prescribed for someone else. The medications individuals most commonly took from someone else were pain relievers (23.6%) and antibiotics (22.0%). The medications most commonly given to someone else were similar, but changed in order, with antibiotics at 21.4% and pain relievers at 15.9%. The factors most predictive of sharing prescription medications were having grown up on a reservation (p=0.012), reporting poor health status (p=0.013), and not having seen a provider in the past year (p=0.074).

Conclusions: This is an area of research that warrants further study, particularly antibiotic misuse. The literature on pain reliever misuse expands daily, but there are dramatic effects to the larger population with the misuse of antibiotics. Interventions are necessary for American Indian communities and others to target all prescription medication misuse.

Keywords: Indians, North American; Substance-Related Disorders; Community-Based Participatory Research; Surveys and Questionnaires

INTRODUCTION

In 2015, 6.4 million Americans over the age of 12 reported current misuse of psychotherapeutic drugs (Center for Behavioral Health Statistics and Quality, 2016a). This includes over 300,000 American Indians (AI) (Center for Behavioral Health Statistics and Quality, 2016b) or 4.7% of individuals who are misusing psychotherapeutic drugs. Given that AI make up 1.7% of the US population (Norris, Vines, & Hoeffel, 2012), this is a disproportionately high percentage. Prescription drug misuse is defined as taking any medication in a way that is not directed by a doctor or use in amounts greater or longer than directed (Center for Behavioral Health Statistics and Quality, 2016a). This includes taking a medication for a legitimate medical issue as well as taking a medication to get high (NIDA, 2016). Misuse of prescription pain relievers drives current estimates of illicit drug use and is only surpassed by current marijuana use (Center for Behavioral Health Statistics and Quality, 2016a). However, pain relievers do not represent all instances of medication misuse. Medications that are known to also be misused include prescription tranquilizers, stimulants, and sedatives (Center for Behavioral Health Statistics and Quality, 2016a). As the literature on the misuse of these prescription drugs continues to expand, there is a gap in knowledge about other medications that may be misused.

It is a common misconception that prescription and over-the-counter drugs are safer than illicit drugs; however, they can often be just as addictive and dangerous (Daniulaityte, Falck, & Carlson, 2012). Adverse effects of prescription abuse of opiates and central nervous system depressants include severe respiratory depression, seizures, and other harmful consequences, including death (NIDA, 2011). The adverse effects of stimulant abuse include feelings of hostility, paranoia, and possible psychosis. Continued use at high doses can result in high body temperature, irregular heartbeat, cardiovascular failure, and seizures (NIDA, 2011). Antibiotic misuse on the other hand can have negative consequences like an increased risk of drug-related adverse events (Cosgrove, 2006; Maragakis, Perencevich, & Cosgrove, 2008). Additionally, the likelihood of drug resistant bacteria emergence is also increased from antibiotic misuse (Cosgrove, 2006; Maragakis et al., 2008).

AI and Alaska Natives (AN) make up less than 2% of the U.S. population, but face many health disparities including increased rates of substance abuse (Greenfield & Venner, 2012). Limited data are available to understand substance abuse, specifically misuse of prescription medications, among AI/AN. According to the National Survey on Drug Use and Health (NSDUH), 18.3% of AI/AN age 12 or older are current users of illicit drugs, defined as someone who has used in the 30 days prior to taking the survey (SAMHSA, 2010). A 2011 NSDUH report indicated that compared to the national average among all races, AI/AN adolescents had higher rates of nonmedical use of prescription-type drugs, at 6.1% vs. 3.3% (SAMHSA, 2011).

A deeper understanding of the problem in AI/AN communities is needed, specifically examining regional differences and exactly what medications are being abused and for what purpose. We conducted a cross-sectional survey to understand misuse of prescription medications among AI adults in our region (we do not have a population of AN people in our region) as a part of a larger survey that examined other health beliefs and behaviors. Here, we report on misuse of different types of prescription drugs, highlighting the need for interventions in this area.

METHODS

A cross-sectional survey was conducted in 2011 by the Center for American Indian Community Health (CAICH) at the University of Kansas Medical Center. CAICH, began as a program in 2006, then in 2010, became a National Institute on Minority Health and Health Disparities funded Center of Excellence. CAICH strives to bring together researchers and AI communities for the purpose of conducting quality community-based participatory research to reduce health disparities. The survey instrument consisted of 151 questions, including participant demographics, general health information, nutrition, physical activity, recreational and traditional tobacco use, environmental tobacco exposure, prescription medication misuse, and beliefs about alcohol and substance use in AI communities. All data were self-reported by study participants. The survey took approximately 20-30 minutes to complete and was administered via touchscreen computer using the Digivey® program. Participants were compensated with a $10 gift card for their time and participation. This study was approved by the Human Subjects Committee at the University of Kansas Medical Center prior to implementation and appropriate tribal communities.

We used multiple methods to recruit participants from 10 different urban and reservation communities in Oklahoma, Kansas, Missouri, and Nebraska. Recruitment occurred at various events such as powwows, health fairs, and other community events. We also recruited participants at CAICH sponsored community research forums (CRF), which is a technique we have developed. During a CRF, study participants, as well as the greater AI community, are invited to a 1-day event where we present findings, have breakout sessions, and recruit for current studies. We also used snowball sampling during events, asking participants to refer others to us. In some cases, participants referred others to us who then completed the survey at a different recruitment event. The eligibility criteria for this study were: men and women who self-identified as AI and were at least 18 years of age and willing to participate. We included only adults in this study because it was our first attempt to understand prescription medication misuse and beliefs about drug and alcohol abuse. Community members told us that there would be greater acceptance of the study if we first talked with adults and later talked with teenagers. There were 381 AI who participated in the survey.

Measures

Demographics. Standard demographic information was collected including age, gender, race/ethnicity, tribal affiliation, marital status, children, education level, self-reported health status, insurance status, and the type of provider seen and frequency of use. The entire survey included questions related to multiple health topics. Here, we report on questions related to misuse of prescription drugs.

Misuse of Prescription Medications. To assess misuse of prescription medications, participants were asked, "Have you ever taken medicine of any kind that was not prescribed to you?" Those who answered "yes", were then asked, "What kind of medicine(s)? Allergy medicine;

antacids; asthma medicine; blood pressure medicine; cholesterol medicine; diabetes medicine; epilepsy/seizure medicine; heart medicine; pain relievers; or water pills." Participants were also asked, "Have you ever given someone else your prescription medicine?" Those who answered "yes", were then asked. "What kind of medicine(s)? Allergy medicine; antacids; asthma medicine; blood pressure medicine; cholesterol medicine; diabetes medicine; epilepsy/seizure medicine; heart medicine; pain relievers; or water pills."

To ascertain how often participants misused prescription medications we asked, "How often do you take medicine that has not been prescribed for you? Responses included: I have only taken medicine that has not been prescribed for me once; once every few years; once per year; a few times per year; monthly; weekly; or daily". We also asked, "How often have you given someone else your prescription medicine? Responses included: I have only given medicine that was not prescribed for me once; once every few years; once per year; a few times per year; monthly; weekly; or daily".

The questions about prescription drug misuse were developed in conjunction with AI community members who were a part of our Community Advisory Board (CAB) and were not taken from previous surveys. They include only very basic information because CAB members felt that our first questions about this topic could not be very specific and needed to be non-threatening to community members.

Data Analysis. Frequency counts and percentages of the demographic variables were reported for individuals who ever took someone else's prescription medication and those who did not, separately. Pearson's Chi-squared test was used to examine the association of each demographic variable and whether a person ever took someone else's prescription medication. If over 20% of expected cell counts were less than 5, the Fisher's exact p-value was used. Counts and percentages were also used to summarize demographic variables for individuals who had taken or given prescription medication from/to others, and the answers to survey questions of what medications had been shared and how often were reported for those subsets. Finally, using stepwise logistic regression, the demographic variables were used to build a model to predict the probability of taking of someone else's prescription drugs, with entering the model and exiting the model boundaries set to 0.15 and 0.2, respectively. All analysis on this data was done in SAS version 9.4 using PROC Logistic.

Dissemination. Results from this study were presented as aggregate data to the participating AI communities through community research forums, CAICH newsletters, and CAICH annual reports to the community. Results were presented here as aggregate data as requested by the participating tribal communities.

RESULTS

Demographic information for all participants (N=361) by whether or not the participant had taken another person's medication is provided in Table 1. The mean age of participants was 41.1 years and 60.1% were female. Approximately one-third of participants (33.8%) reported that they had taken medication that had been prescribed for someone else. Almost one-fourth of participants (24.1%) reported that they had given someone else their prescription medication. While 19.9% reported that they had both given and taken prescription medication from others.

Logistic stepwise regression was run on the variables listed in Table 1 to predict the probability of taking someone else's prescription medication. Three factors were found to be

significantly or borderline significantly related: Where participants grew up (p=0.012), how healthy they say they are (p=0.013), and the last time they saw their provider (p=0.074). Individuals living in reservation or tribal trust (odds ratio=2.20, p=0.034), urban or suburban (OR=2.20, p=0.025), and multiple locations (OR=5.79, p=0.001) were all more likely to take medications from others compared to individuals living in rural non-reservation. Individuals who considered their health condition "Good" were not significantly different (OR=1.23, p=0.46) while those in "Fair or poor" condition were more likely (OR=2.37, p=0.005) to take medications from others compared to those in "excellent" health conditions. Individuals who last time saw their providers in less than 1 month (OR=0.62, p=0.07) and more than 12 months ago (OR=0.49, p=0.08) were borderline cases of being less likely to take medications from others compared to those saw their providers in 1-12 months.

Table 1. Demographics by participant misuse of medication

Demographic	Have Taken Another Person's Medication		p-value
	Yes N (%)	No N (%)	
Age (mean) (range)	**41.1**	**18-86**	
Gender			0.302 (e)
Male	43 (35.0%)	101 (42.1%)	
Female	79 (64.2%)	138 (57.5%)	
Race/Ethnicity			0.430
American Indian alone	94 (76.4%)	192 (80.0%)	
American Indian in combination with another race/ethnicity	29 (23.6%)	48 (20.0%)	
Where participants grew up			0.012
Reservation or tribal trust	36 (30.3%)	66 (29.2%)	
Rural non-reservation	14 (11.8%)	54 (23.9%)	
Urban or suburban	57 (47.9%)	97 (42.9%)	
Multiple locations	12 (10.1%)	9 (4.0%)	
Marital status			0.688
Married/living with partner	60 (48.8%)	124 (51.7%)	
Never married	33 (26.8%)	53 (22.1%)	
Divorced/separated/widowed	23 (18.7%)	44 (18.3%)	
Other	7 (5.7%)	19 (7.9%)	
Children			0.382
Yes	91 (74.0%)	167 (69.6%)	
No	32 (26.0%)	73 (30.4%)	
Highest level of education completed			0.225
High school/GED/Post-High School Certification or less	42 (34.2%)	100 (41.7%)	
Any college	41 (33.3%)	56 (23.3%)	
College graduate	31 (25.2%)	65 (27.1%)	
Graduate degree	9 (7.3%)	19 (7.9%)	
In general, you would say your health is…			0.081
Excellent or very good	35 (28.5%)	92 (38.3%)	
Good	47 (38.2%)	91 (37.9%)	
Fair or poor	41 (33.3%)	57 (23.8%)	

Health insurance			0.877
No insurance	25 (20.3%)	55 (22.9%)	
Private or tribal insurance	43 (35.0%)	79 (32.9%)	
Indian Health Service	27 (22.0%)	44 (18.3%)	
Medicaid/Medicare	16 (13.0%)	36 (15.0%)	
Multiple insurance	12 (9.8%)	26 (10.8%)	
Regular primary care provider			0.124
Yes	84 (68.3%)	182 (75.8%)	
No	39 (31.7%)	58 (24.2%)	
Type of primary care provider			0.594
Doctor	82 (66.7%)	169 (70.4%)	
Physician's Assistant or Nurse Practitioner	26 (21.1%)	52 (21.7%)	
Traditional Healer	8 (6.5%)	9 (3.75%)	
Other	7 (5.7%)	10 (4.2%)	
Last time saw provider			0.157
Less than 1 month	36 (29.3%)	84 (35%)	
Between 1 and 12 months	77 (62.6%)	126 (52.5%)	
More than 12 months ago	10 (8.13%)	30 (12.5%)	
Number of times saw a provider in the last year			0.259
None	15 (12.2%)	45 (18.8%)	
1 to 4 times	86 (69.9%)	159 (66.3%)	
5 or more times	22 (17.9%)	36 (15%)	

Misuse of specific types of prescription medication is reported in Table 2 by both participants who gave someone else their medication and those who took someone else's medication. Participants were most likely to take someone else's pain relievers (23.6%) and antibiotics (22%). They were also more likely to give these medications to others, though the order was reversed, with 21.4% giving antibiotics to someone else and 15.9% giving pain relievers to someone else.

Table 2. Participant misuse of prescription medication

Type of Medication	Taken Someone Else's N (%)[a]	Given to Someone Else N (%)[b]
Pain relievers	86 (23.6%)	58 (15.9%)
Antibiotics	80 (22%)	78 (21.4%)
Allergy medicine	34 (9.3%)	9 (2.5%)
Other	27 (7.4%)	20 (5.5%)
Antacids	24 (6.6%)	14 (3.8%)
Asthma medicine	8 (2.2%)	7 (1.9%)
Blood pressure medicine	6 (1.6%)	3 (0.87%)
Water pills	5 (1.3%)	2 (0.55%)
Cholesterol medicine	4 (1.1%)	4 (1.1%)
Diabetes medicine	3 (0.8%)	5 (1.4%)
Epilepsy or seizure medicine	2 (0.55%)	0 (0%)
Heart medicine	1 (0.27%)	1 (0.3%)

[a] The percentage given is the percentage of participants who have taken someone else's medication of the type listed in the row out of the total participants in the study.
[b] The percentage given is the percentage of participants who have given their medication to someone else out of the total participants in the study.

How often participants share medication is presented in Table 3. Participants did not share medications regularly; sharing only once every few years was the most common response (10.7% for taking someone else's medication and 8.2% for giving someone their own).

Table 3. How often participants are misusing prescription medication

Frequency of Misuse	Taken Someone Else's N (%)[a]	Given to Someone Else N (%)[b]
Once	25 (6.9%)	9 (2.5%)
Once every few years	39 (10.7%)	30 (8.2%)
Once per year	17 (4.7%)	12 (3.3%)
A few times per year	27 (7.4%)	26 (7.1%)
Monthly	6 (1.6%)	1 (0.27%)
Weekly	2 (0.55%)	2 (0.55%)
Daily	7 (1.9%)	1 (0.27%)

[a] The percentage given is the percentage of participants who have taken someone else's medication for the amount of time listed in the row out of the total participants in the study.
[b] The percentage given is the percentage of participants who have given their medication to someone else out of the total participants in the study.

DISCUSSION

The literature on pain reliever (opiate) misuse expands daily, but there is a lack of data for AI and a lack of data on the misuse of other prescription medications. Our initial survey begins to address this paucity of data. This survey of AI in our region shows that pain relievers are one of the most commonly misused prescription medications and that they are being misused at rates (23.6%) similar to other reported data (30.0%) in a reservation sample of AI (Momper, Delva, Tauiliili, Mueller-Williams, & Goral, 2013). However, most notable among other medications are antibiotics, which our participants misused at similar rates to pain relievers. It is well known that not finishing a course of antibiotics and instead giving it to someone else can lead to drug resistant strains of bacteria, thus putting populations at greater risk (Ventola, 2015). In addition, the fact that over 20% of our sample shared antibiotics highlights the lack of use of or access to appropriate medical care. It is possible that participants are sharing antibiotics because they do not have access to a doctor to get the prescription for themselves. It is likewise possible that participants are unwilling to seek medical care for a variety of reasons, such as mistrust of the medical establishment, inability to get to a doctor's office, etc. (Pacheco et al., 2013). More research is needed to understand the reasons behind antibiotic sharing to effectively combat this issue.

The factors most predictive of sharing any medication in our sample were self-reported health status (poorer health leading to greater sharing), where a participant grew up (growing up in an urban/suburban area or moving around a lot leading to greater sharing), and not having seen a primary care provider recently. These factors again point to possible problems with access to care or an unwillingness to seek care.

Our small convenience sample size, cross-sectional study design, and self-report data lead to obvious limitations to the study. Although we included multiple rural, urban, and reservation communities from multiple states in the midwestern region of the US, our findings may not be generalizable to other AI communities in other regions of the US. However, these data point to a clear need for further research on this topic. Our next step is a larger, more comprehensive survey to understand misuse of prescription medication, as well as illicit drug use, in this community,

followed by a qualitative study to understand the reasons behind prescription drug misuse. The small sample reported here was a necessary step in building trust with the community to address this sensitive topic and provides an initial picture of some of the issues that may contribute to prescription medication misuse. Our hope is that interventions can be developed based on this formative work to begin to address the epidemic of prescription drug misuse in AI communities.

REFERENCES

Center for Behavioral Health Statistics and Quality. (2016a). *Key Substance Use and Mental Health Indicators in the United States: Results from the 2015 National Survey on Drug Use and Health*. Retrieved from http://www.samsha.gov/data/.

Center for Behavioral Health Statistics and Quality. (2016b). *Results from the 2015 National Survey on Drug Use and Health: Detailed Tables*. Substance Abuse and Menal Health Servies Administration.

Cosgrove, S. E. (2006). The relationship between antimicrobial resistance and patient outcomes: mortality, length of hospital stay, and health care costs. *Clin Infect Dis, 42 Suppl 2*, S82-89. doi: 10.1086/499406

Daniulaityte, R., Falck, R., & Carlson, R. G. (2012). "I'm not afraid of those ones just 'cause they've been prescribed": perceptions of risk among illicit users of pharmaceutical opioids. *Int J Drug Policy, 23*(5), 374-384. doi: 10.1016/j.drugpo.2012.01.012

Greenfield, B. L., & Venner, K. L. (2012). Review of substance use disorder treatment research in Indian country: future directions to strive toward health equity. *Am J Drug Alcohol Abuse, 38*(5), 483-492. doi: 10.3109/00952990.2012.702170

Maragakis, L. L., Perencevich, E. N., & Cosgrove, S. E. (2008). Clinical and economic burden of antimicrobial resistance. *Expert Rev Anti Infect Ther, 6*(5), 751-763. doi: 10.1586/14787210.6.5.751

Momper, S. L., Delva, J., Tauiliili, D., Mueller-Williams, A. C., & Goral, P. (2013). OxyContin use on a rural midwest American Indian reservation: demographic correlates and reasons for using. *Am J Public Health, 103*(11), 1997-1999. doi: 10.2105/ajph.2013.301372

NIDA. (2011). Prescription Drugs: Abuse and Addiction. National Institute on Drug Abuse.

NIDA. (2016). Misuse of Prescription Drugs *National Institute on Drug Abuse Website* (Vol. 2017).

Norris, T., Vines, P. L., & Hoeffel, E. M. (2012). *The American Indian and Alaska Native Population: 2010*. U.S. Census Bureau.

Pacheco, C. M., Daley, S. M., Brown, T., Filippi, M., Greiner, K. A., & Daley, C. M. (2013). Moving forward: breaking the cycle of mistrust between American Indians and researchers. *Am J Public Health, 103*(12), 2152-2159. doi: 10.2105/ajph.2013.301480

SAMHSA. (2010). *Results from the 2009 National Survey on Drug Use and Health: Volume I. Sumary of Nation Findings*.

SAMHSA. (2011). *Substance Use Among American Indian or Alaska Native Adolescents*.

Ventola, C. L. (2015). The Antibiotic Resistance Crisis: Part 1. *Pharmacy and Therapeutics, 40*(4), 277-283.