# PRESCRIPTION OPIOID EDUCATION PROVIDED BY DENTISTS TO PATIENTS FOLLOWING THIRD MOLAR EXTRACTIONS

by

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### Introduction

Opioids are a group of chemically similar drugs that include heroin and prescription pain relievers such as hydrocodone, oxycodone, and morphine (Ahrnsbrak, 2016). Opioids are commonly misused and have potential for abuse or addiction (Denisco et al., 2011). As the use of opioids for pain management has increased, so has the incidence of misuse. According to the data available from the National Survey on Drug Use and Health, it is indicated that approximately 11.8 million people misuse opioids in the past year, including 11.5 million pain reliever misusers. This included taking more than the amount prescribed along with the use of other substances such as alcohol and sedatives. These pain relievers were taken to aid with things other than physical pain such as to reduce anxiety or improve sleep (NSDUH, 2019). Among people aged 12 or older who misused pain relievers, about half of them indicated that they had obtained these pain relievers through a friend or a relative (Ahrnsbrak, 2016). Opioids can be prescribed to relieve and control pain, diminish cough, and produce feelings of euphoria and tranquility which may lead to patients continuing opioid use following treatment despite any development of serious problems. This may lead to the need of increasing doses in order to continue to achieve these desired effects, which can lead to death (Schuckit, 2016). Opioids used in increased amounts, or use for longer than intended, may result in an opioid-use disorder. An opioid-use disorder is also defined as the repeated occurrence of a strong desire to use an opioid, use of it in physically hazardous situations such as driving, continued use with results in interpersonal problems, social problems, and interference with work, and many other ways (Schuckit, 2016).

#### **Background**

# Prescribing of opioid medications by dental providers

In the United States, dentists prescribe 6.4% of all opioid prescriptions. Dentists are more likely to prescribe opioids than primary care physicians, and areas with a higher number of dentists have increased rates of opioid prescriptions (Koppen, Suda, Rowan, McGregor, & Evans, 2018). Opioids account for nearly one-third of prescriptions dentists issue and because of the commonness of extraction procedures, dental opioid prescribing is very frequent for adolescent patients, who are at a high risk of misusing the drug (Gupta, Vujicic, & Blatz, 2018). The most common procedure that is often prescribed postprocedural opioids such as hydrocodone and oxycodone is third molar extractions (Gupta et al., 2018). Oral surgeons and general dentists prescribe an average of 20 opioid pills after tooth extraction (Maughan et al., 2016). Postsurgical pain from this procedure tends to be moderate, and most dental providers prescribe nonsteroidal anti-inflammatory drugs alongside opioid combination drugs (Maughan et. al., 2016). However, it has been found that anti-inflammatory analgesics, such as ibuprofen and acetaminophen, work better alone than in combination with opioids to ease acute dental pain (Cohen, 2019). Additionally, the added use of an opioid along with ibuprofen and acetaminophen, increases the risk of patients' experiencing adverse effects such as nausea and vomiting along with psychomotor impairments that they would not have experienced if they used an anti-inflammatory analgesic alone (Moore & Hersh, 2013). Best practices recommend that opioid analgesics should be reserved for situations where ibuprofen and acetaminophen are not sufficient enough for pain management (McCauley et al., 2016).

#### Access at the home to opioids

Several studies have shown that adolescents are more likely to obtain controlled medications such as opioids for non-medical uses from family members or friends rather than from drug dealers/strangers from the Internet (Ross-Durow, McCabe, & Boyd, 2013). A study conducted among a sample population of 7th and 8th graders from two school districts found that the majority (83.4%) of adolescents who had been prescribed medications in the last 6 months had unsupervised access to them (Ross-Durow et al., 2013). Inadequate supervision can lead to a diversion of these medications through giving or selling. Along with that, other adolescents that visit the household can easily get a hold of the medications. There is a need for research that examines the storage practices of opioid medications within adolescents' and young adults' homes. Safety with opioid medications is a major concern because of their potential for substance use disorder (SUD).

## Leftover opioid medications

It has been estimated that more than half of all opioid medications prescribed following dental surgery goes unused which may lead to misuse and abuse of opioids (Nadeau, Hasstedt, Sunstrum, Wagner, & Tu, 2018). The FDA recommends that patients dispose of their unused medications but the problem is that prescribers rarely give instructions on how to do so (Maughan et al., 2016). Despite the risk of misuse, education on medication disposal does not occur among dental patients, dentists, and most health care providers due to lack of training and systems that are used to screen and address patients with addiction who are seeking care at their practice (Gupta et al., 2018).

## Opioid education provided to patients by prescribers

Oral care providers represent a credible information source to patients and are highly skilled at providing advice regarding disease prevention. However, many dentists lack the confidence in discussing

matters related to alcohol, tobacco, and pain medication misuse (McCree, 2012). Dentists are encouraged by the (American Dental Association) to continue education on appropriate use and prescription of opioid pain medications. They are also expected to use professional judgement to be able to identify which patients can be prescribed opioid medications compared to those who are at risk of opioid medication abuse (Denisco, Kenna, O'Neil, et al.,2011). Dentists should advise patients to not share prescription medications and to dispose of the unused prescription medication once they are no longer needed to resolve the condition (Denisco, Kenna, O'Neil, et al.,2011).

#### Purpose

The objective of this study is to assess the prevalence of education on opioid handling provided to adolescent and young adult patients by dentists, and the relationship between the provision of education with secure storage of opioid medications in the home. The types of postprocedural medications prescribed to adolescents and young adults following a third molar extraction will be evaluated along with their access to these medication in their home. The results of this study aim to inform opioid prescribing practices by dentists by identifying types of medications prescribed following a dental procedure and the impact of post-procedural educational materials on storage and disposal of leftover opioid medications.

### **Research Questions**

The objective of this study was to examine the relationship between the provision of education on handling opioid prescriptions by dental providers and secure storage of opioid medications in the homes among young adults who experienced a third molar extraction and received a prescription for opioid medication. Education provided by the dental prescriber was the independent variable and

consisted of education on secure storage and proper disposal of opioid medications and the dangers of opioid misuse. The dependent variable was secure storage of opioid medications in the home.

## Methodology

#### Research design

A cross-sectional survey was used to collect information about experiences with post-procedural medications for third molar extractions. The population that we recruited for the survey was East Carolina University students ranging in age from 18-23. This survey was distributed via the Honors ListServ, fliers were placed around ECU's campus, and fliers were posted in local dental offices (n= 1 office). A statement of informed consent was included at the beginning of the online survey; continuing onto the survey indicated willingness to participate. A total of 91 young adults participated in the survey Prior to conducting the study, IRB approval was obtained (IRB:19-003036.

### Measures

Our independent variables consisted of three different variables that may have been discussed by the dentist: secure storage of opioid medication, proper disposal of opioid medication, and the dangers of opioid misuse. The first question the survey sought to answer was whether the dentist or dental staff had talked to the patient regarding dangers of opioid misuse before the operation, immediately following the operation, or during the post-operation follow up. The response options that were given were: Yes, No, and Don't Know. The second question that was asked was whether the dentist or dental staff talked to the patient regarding proper storage of opioid medication before the operation, immediately following the operation, or during the post-operation follow up. The response options that were given were: Yes, No, and Don't Know. Lastly, the third question asked whether the dentist discussed proper disposal of unused opioid medications before the operation, immediately

following the operation, or during the post-operation follow-up. The response options for this were also:

Yes, No, and Don't Know. We created a single variable to assess any guidance provided by a dentist by

combining any affirmative responses to the previous three questions into a single dichotomous variable.

Our dependent variable was secure storage of opioid medications at home. To measure secure storage of opioid medications in the home, we combined the results from the three questions that were asked regarding the education provided by the dentist to the patient. This included whether the dentist discussed the dangers of opioid misuse, the proper storage of opioid medication, and the proper disposal of unused opioid medications.

Questions regarding basic demographics such as gender, race, year in school, highest degree the respondents' mother and father had received, and form of insurance were included at the end of the survey.

### Data analysis

Descriptive statistics were calculated for the overall sample and by secure storage of prescription opioids in the home. Bivariate logistical regression was conducted to assess the relationship between any guidance provided by the dentist and secure storage at home. The analytical sample consisted of 91 young adults who reported having a third molar extraction for descriptive statistics (Table 1 and 2) and 61 young adults who reported being prescribed and filling an opioid medication for pain management following a third molar extraction for bivariate logistic regression (Table 3). Additional statistical modeling was not conducted due to small cell sizes.

## Results

Sample characteristics by secure storage of prescription opioids at home

Demographic characteristics for our sample are presented in Table 1. Among our sample, 27.9% securely stored their prescription opioids at home following their third molar extraction.

Table 1: Demographics (n=91 young adults who participated in the survey)

Demographics		Overall n(%)	Opioids Stored Securely	Opioids Not Stored Securely
Gender				
	Female	65 (72.2)	15 (78.9)	50 (70.4)
	Male	22 (24.4)	4 (21.1)	18 (25.4)
Race	Other	2 (2.2)	0 (0.0)	3 (4.2)
	White	74 (81.3)	16 (84.2)	58 (80.6)
	Black, African American	5 (5.5)	0 (0.0)	5 (6.9)
	American Indian or Alaska Native	1 (1.1)	0 (0.0)	1 (1.4)
	Asian	5 (5.5)	2 (10.5)	3 (4.2)
	Spanish/hispanic or latino	3 (3.3)	0 (0.0)	3 (4.2)
	Other	0 (0.0)	0 (0.0)	0 (0.0)
Age	More than one	3 (3.3)	1 (5.3)	2 (2.8)
	18	16 (17.6)	2 (10.5)	14 (19.4)
	19	26 (28.6)	5 (26.3)	21 (29.2)
	20	24 (26.4)	6 (31.6)	18 (25.0)
	21	17 (18.7)	4 (21.1)	13 (18.1)
	22	3 (3.3)	1 (5.3)	2 (2.8)
	23	3 (3.3)	1 (5.3)	2 (2.8)
	24	0 (0.0)	0 (0.0)	0 (0.0)
	25	2 (2.2)	0 (0.0)	2 (2.8)
ECU student				

Yes	90 (98.9)	19 (100.0)	71 (98.6)
No <b>Year in school</b>	1 (1.1)	0 (0.0)	2 (1.4)
1 <sup>st</sup> year undergraduate	29 (33.0)	3 (15.8)	26 (37.7)
2 <sup>nd</sup> year undergraduate	22 (25.0)	7 (36.8)	15 (21.7)
3 <sup>rd</sup> year undergraduate	25 (28.4)	6 (31.6)	19 (27.5)
4 <sup>th</sup> year Undergraduate	12 (13.6)	3 (15.8)	9 (12.5)
5 <sup>th</sup> year or more undergraduate	0 (0.0)	0 (0.0)	0 (0.0)
Mothers Educational Attainment	, ,	, ,	, ,
Did not finish high school	2 (2.2)	0 (0.0)	2 (2.8)
High school diploma or the equivalent (GED)	6 (6.6)	1 (5.3)	5 (6.9)
Attended college but did not complete degree	11 (12.1)	2 (10.5)	9 (12.5)
Associate degree or trade/technical training	7 (7.7)	2 (10.5)	5 (6.9)
Bachelor's degree (BA, BS, etc)	39 (42.9)	8 (42.1)	31 (43.1)
Master's Degree (MA, MS, MFA, MBA, MPP, MPA,	25 (27.5)	6 (31.6)	19
MPH, etc. )			(26.4)
Doctoral or professional degree ( PhD, EdD, JD, MD, etc.)	1 (1.1)	0 (0.0)	1 (1.4)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
Father's Educational Attainment			
Did not finish high school	6 (6.7)	0 (0.0)	6 (8.5)
High school diploma or the equivalent (GED)	11 (12.2)	1 (5.3)	10 (14.1)
Attended college but did not complete degree	3 (3.3)	0 (0.0)	3 (4.2)
Associate degree or trade/technical training	15 (16.7)	4 (21.1)	11 (15.5)
Bachelor's degree (BA, BS, etc)	30 (33.3)	10 (52.6)	20 (28.2)
Master's Degree (MA, MS, MFA, MBA, MPP, MPA, MPH, etc. )	16 (17.8)	2 (10.5)	14 (19.7)
Doctoral or professional degree ( PhD, EdD, JD, MD, etc.)	9 (10.0)	2 (10.5)	7 (9.9)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
Primary Health Insurance			
College/University Student Health Insurance Plan	1 (1.1)	0 (0.0)	1 (1.4)

Parent/Guardian's plan	86 (95.6)	19 (100.0)	67 (94.4)
Employer-based plan or (spouse/partner's employer- based plan)	1 (1.1)	0 (0.0)	1 (1.4)
Medicaid, Medicare, SCHIP	2 (2.2)	0 (0.0)	2 (2.8)
Bought own plan	0 (0.0)	0 (0.0)	0 (0.0)
Don't have health insurance	0 (0.0)	0 (0.0)	0 (0.0)
Don't know if they have health insurance	0 (0.0)	0 (0.0)	0 (0.0)
Has health insurance, but doesn't know primary source	0 (0.0)	0 (0.0)	0 (0.0)

### Experience with last third molar extraction by secure storage of prescription opioids at home

The second part of the survey involved questions regarding the time frame of the respondents' wisdom teeth removal, quantity of teeth removed, whether the dentist prescribed a non-opioid or opioid medication to treat pain, whether the respondent of a family member picked up the prescribed opioid medication, whether the opioid medication was refilled, length of time the respondent was with a parent or guardian following the surgical procedure, whether the opioids were given by a parent or guardian, and where the opioids were stored at home. Regarding the time frame of the respondent's wisdom teeth removal, the majority had their wisdom teeth removed more than 12 months ago (68.1%), followed by more than 6 months ago but in the past 12 month (18.7%), more than 30 days ago but in the past 6 months(9.9%), and in the past 30 days (3.3%). Among our sample, 68 young adults were prescribed an opioid medication to treat pain and only 27.9% percent of those young adults had stored the opioid medication securely. It is also important to note that among the 68 adults that were prescribed opioid medication to treat pain, 12.9% had the opioid medications refilled.

Table 2: Information on Third Molar Extractions (n=91 young adults who participated in the survey)

Information on Third Molar Extractions	Overall n(%)	Opioids Stored Securely	Opioids Not Stored Securely
Time Frame of Wisdom Teeth Removal			
In the past 30 days	3 (3.3)	0 (0.0)	3 (4.2)
More than 30 days ago but in the past 6 months	9 (9.9)	1 (5.3)	8 (11.1)
More than 6 months ago but in the past 12 months	17 (18.7)	0 (0.0)	17 (23.6)
More than 12 months ago	62 (68.1)	18 (94.7)	44 (61.1)
Quantity of teeth removed			
1	2 (2.2)	0 (0.0)	2 (2.8)
2	12 (13.2)	2 (10.5)	10 (13.9)
3	5 (5.5)	1 (5.3)	4 (5.6)
4	71 (78.0)	16 (84.2)	55 (76.4)
Other	1 (1.1)	0 (0.0)	1 (1.4)
Dentist prescribed a non-opioid medication to treat pain			
Yes	75 (82.4)	15 (78.9)	60 (83.8)
No/Don't' know	16 (17.6)	4 (21.1)	12 (16.7)
Dentist prescribed an opioid medication to treat pain			
Yes	68 (74.7)	19 (100.0)	49 (68.1)
No/ Don't know	23 (25.3)	0 (0.0)	23 (32.0)
You or family member picked-up prescribed opioid medication			
Yes, I did	4 (5.9)	0 (0.0)	4 (8.2)
Yes, a family member did	56 (82.4)	13 (68.4)	43 (87.8)
Yes, someone did	2 (2.9)	1 (5.3)	1 (2.0)
No	6 (8.8)	5 (26.3)	1 (2.0)
Opioid Refill			
Yes	8 (12.9)	1 (7.1)	7 (14.6)
No	54 (87.1)	13 (92.9)	41 (85.4)
Length of time with parent/guardian			
I did not stay in the same home with a parent or	2 (2.9)	0 (0.0)	2 (4.1)
guardian following wisdom teeth removal			
Less than 1 day	4 (5.9)	1 (5.3)	3 (6.1)
1-3 days after wisdom teeth removal	16 (23.5)	7 (36.8)	9 (18.4)
4-7 days	13 (19.1)	2 (10.5)	11 (22.4)
More than 7 Days	33 (48.5)	9 (47.4)	24 (49.0)
Opioids available without parent or guardian present			
All of the time	39 (57.4)	2 (10.5)	37 (75.7)
Some of the time	9 (13.2)	1 (5.3)	8 (16.3)
Rarely	5 (7.4)	1 (5.3)	4 (8.2)
Never	15 (22.1)	15 (78.9)	0 (0.0)

Opioids given by a parent of guardian			
All of the time	19 (28.4)	6 (31.6)	13 (27.1)
Some of the time	18 (26.9)	3 (15.8)	15 (31.3)
Rarely	12 (17.9)	3 (15.8)	9 (18.8)
Never	18 (26.9)	7 (36.8)	11 (22.9)
Where were opioids stored at home			
Your room	33 (36.3)	3 (15.8)	30 (41.7)
Parents' room	4 (4.4)	2 (10.5)	2 (2.8)
Bathroom	4 (4.4)	2 (10.5)	2 (2.8)
Kitchen	36 (39.6)	8 (42.1)	28 (38.9)
Other room	2 (2.2)	0 (0.0)	0 (0.0)
Unsure where kept	2 (2.2)	2 (10.5)	0 (0.0)
More than one	12 (13.2)	2 (10.5)	10 (13.9)

### Education on opioid handling practices and secure storage of prescription opioids at home

As shown in Table 3, only 27.9% had any guidance about opioids provided to them by their dentists. Results from the logistic regression did not indicate a statistically significant relationship between provision of education and secure storage of opioids at home (OR=1.62; CI=0.53, 4.93). Only 27.9% young adults had discussed the dangers of opioid misuse with their dentist. Among those, 31.6% had stored the opioid medication securely in their home. There were 15 (22.1%) young adults that had discussed the storage of opioid medications with their dentist. Among these young adults, 26.3% had stored the opioids securely in their home. Around sixteen percent of young adults had discussed the disposal of unused opioid medications with their dentist. Among those, only 15.8% had stored the opioids securely in the home.

Table 3: Information on third molar extractions (n=61 young adults who filled an opioid prescription following a third molar extraction)

Information on Third Molar Extractions	<b>Opioids Stored</b>	<b>Opioids Not Stored</b>
	Securely	Securely
	n (%)	n (%)
Dentist provided any guidance about opioids		
Yes	6 (31.6)	16 (23.5)
No/ Don't know	13 (68.5)	56 (82.4)
Dentist talked about dangers of opioid misuse		
Yes	6 (31.6)	13 (26.5)
No/ Don't know	13 (68.5)	36 (73.4)
Dentist talked about storage of opioid medications		
Yes	5 (26.3)	10 (20.4)
No/ Don't know	14 (73.7)	39 (79.6)
Dentist talked about the disposal of unused opioid		
medications		
Yes	3 (15.8)	8 (16.3)
No/ Don't know	16 (84.3)	41 (83.7)

#### **Closure:**

The objective of this study was to examine the relationship between the provision of education on handling opioid prescriptions by dental providers and secure storage of opioid medications in the homes among young adults who experienced a third molar extraction and received a prescription for opioid medication. We did not find a statistically significant relationship between opioid education provided by a dentist and secure storage of opioids provided at home to support our hypothesis.

Only 27.9% of dentists talked with their patients on the dangers of opioid misuse, storage of opioid medications, or the disposal of unused medications. There are many reasons as to why the percentage of dentists that talked with their patients regarding storage was substantially low. Often, dentists fail to obtain substance use histories from patients and are often reluctant to discuss such matters with their patients (Mcree, 2012). Along with that, many dentists feel that they haven't had the

professional training that is needed to discuss alcohol, tobacco, or opioid misuse with their patients (Mcree,2012). Regardless if the young adults in our sample were provided with education, the majority of the young adults did not store the opioids securely in their home.

Collectively, the findings from this study demonstrates that there is room for improvement on dental practices that can impact patient opioid handing behavior.

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