

The Relationship between Media and Public Opinion  
Regarding Cannabis as an Opioid Substitute  
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According to the 2018 Centers for Disease Control and Prevention (CDC) Drug Surveillance Report, a total of 191,146,822 opioid prescriptions were filled by retail pharmacies in the United States during 2017 (p. 10). Opioids are a broad class of pain-relieving drugs encompassing many different medications used for numerous conditions. As reported by the National Academies of Sciences, Engineering, and Medicine (NASEM, 2017a), there are many different types of prescription opioids (e.g., hydrocodone, morphine, fentanyl, etc.) that “differ in their chemical composition, route of administration, uptake, distribution, type/rate of elimination, and ability to bind to opioid receptors” (p. 53). Despite these differences, their effects are generally the same; they inhibit the perception of pain by binding to  $\mu$  opioid receptors on nervous system cells (NASEM, 2017a).

While opioids have proven to be effective pain-relievers for forms of acute and subacute pain, there is little evidence behind the efficacy of their use for chronic pain (Sehgal, Colson, & Smith, 2013; Chou et al., 2015). According to Sehgal et al. (2013), “RCTs [randomized controlled trials] that evaluate long-term (16 weeks or longer) efficacy of opioids are lacking. No study has shown clinically significant ( $\geq 50\%$  pain reduction) and sustained pain relief with opioids over several months and years” (Sehgal et al., 2013, p. 1202). Furthermore, not only is there little evidence to support the use of opioids for chronic pain, but there is also growing concern over the potential abuse and risk of overdose associated with their long-term use.

***The Opioid Crisis***

According to the previously mentioned CDC Drug Surveillance report (2018), an estimated 11,517,000 people reported they misused their prescription pain reliever in 2016 (p.

14). Furthermore, the report also adds that 42,249 people died from an opioid overdose in 2016, with 17,087 coming from prescription opioids (CDC, 2018, p. 23-24). These statistics highlight two significant problems in the United States: 1) there is an issue with the prescription rate of opioids and 2) too many people wind up overdosing from their prescription. It has become such a rampant issue that President Trump declared it a public health emergency in 2017. During his declaration, he stated, “No part of our society — not young or old, rich or poor, urban or rural — has been spared [by] this plague of drug addiction and this horrible, horrible situation that’s taken place with opioids” (as cited in Davis, 2017). Evidently, there is a need for opioid substitutes that are effective in their treatment yet limited in their side effects and the consequences of their abuse.

### ***Cannabis***

One potential substitute that has gained popularity in recent years is cannabis. Commonly referred to as medical marijuana, the term cannabis is used to describe any drug that is derived from the plant genus *cannabis* (Whiting et al., 2015). It is composed of over 80 different components, termed cannabinoids, which are capable of producing a variety of effects. Cannabinoids produce these effects by binding to cannabinoid receptors located throughout the body (Wallace, Marcotte, Umlauf, Gouaux, & Atkinson, 2015; Schrot & Hubbard, 2016). These receptors are normally activated by endogenous cannabinoids (endocannabinoids), which help regulate numerous bodily functions—including pain perception. Evidence suggests that cannabinoids produce most of their pain-relieving effects through the CB1 subtype of cannabinoid receptors, but CB2 receptors may also play a role (Pertwee, 2009).

Over the past several decades, cannabis has been legalized for medicinal purposes in 31 states, the District of Columbia (DC), Guam, and Puerto Rico (Hanson & Garcia, 2018).

However, only three cannabinoid drugs have been approved by the United States Food and Drug Administration (FDA)—Dronabinol, Nabilone, and Epidiolex (Schrot & Hubbard, 2016; FDA, 2016). According to Schrot and Hubbard (2016), Dronabinol is used to treat anorexia in human immunodeficiency virus (HIV) patients with severe weight loss and, along with Nabilone, to curb nausea in chemotherapy patients. Additionally, Epidiolex is used to treat two severe forms of epilepsy, Lennox-Gastaut syndrome and Dravet syndrome (FDA, 2018).

Despite there only being three FDA approved cannabinoid drugs, there is reason to suspect more could be approved in the future. During the press announcement for the approval of Epidiolex, the FDA commissioner, Scott Gottlieb, stated, “This approval serves as a reminder that advancing sound development programs that properly evaluate active ingredients contained in marijuana can lead to important medical therapies” (FDA, 2018). This means that more cannabinoid drugs may become available in the future if adequate research is conducted into the different components of cannabis. Even so, while there is potential for more cannabinoid drugs to be approved by the FDA and many states are legalizing the use of cannabis for medicinal purposes, it is necessary to determine if cannabis can be an effective analgesic medication. If not, there is little reason for its use as an opioid substitute.

### ***Efficacy and Safety of Cannabis***

Recent studies have found that cannabis is an effective analgesic drug for acute pain. For instance, De Vita, Moskal, Maisto, and Ansell (2018) conducted a systematic review and meta-analysis of 18 studies and found that cannabinoid use led to a significant, yet small, increase in pain threshold; a significant small-to-medium decreased unpleasantness rating; a significant small-to-medium increase in pain tolerance; and no significant association with ongoing experimental pain intensity or mechanical hyperalgesia (De Vita et al., 2018). The researchers

also found that higher doses of cannabinoids had a greater significant analgesic effect than lower doses (De Vita et al., 2018).

In another study, Wallace et al. (2015) conducted a randomized, placebo-controlled, crossover study of 16 subjects with diabetic peripheral neuropathic pain. After having each participant undergo 4 single dosing sessions, the researchers found that there was a significant reduction in pain correlated with an increase in tetrahydrocannabinol (THC) concentration from the placebo to the low (1% THC), low to medium (4% THC), and medium to high (7% THC) concentration groups (Wallace et al., 2015).

Furthermore, Wilsey et al. (2016) conducted a randomized, placebo-controlled, crossover study of 42 subjects with central neuropathic pain and found cannabis was effective in reducing pain, but, unlike the studies by De Vita et al. and Wallace et al., pain relief was not significantly associated with the concentration of THC (Wilsey et al., 2016). Therefore, while all three of the aforementioned studies support the use of cannabis for acute pain (Wallace et al., 2015; De Vita et al., 2018; Wilsey et al., 2016), more research is needed to determine the relationship between cannabinoid concentration and analgesic effect.

Cannabis has also been shown to be effective in treating chronic pain. In a 2015 systematic review and meta-analysis, Whiting et al. assessed 28 studies (63 reports; 2454 participants) to determine the analgesic effectiveness of different forms of cannabinoids including nabiximols, smoked THC, nabilone, THC oromucosal spray, dronabinol, vaporized cannabis, ajuvenic acid capsules, and oral THC. The researchers found moderate-quality evidence to support the use of cannabinoids to treat chronic pain (Whiting et al., 2015). They also found there was an increased risk of short-term adverse events, which included “asthenia, balance problems, confusion, dizziness, disorientation, diarrhea, euphoria, drowsiness, dry

mouth, fatigue, hallucination, nausea, somnolence, and vomiting” (Whiting et al., 2015, p. 2467). However, they were unable to identify a study that assessed the long-term adverse events associated with cannabis use (Whiting et al., 2015).

Yet, in a following study, Ware, Wang, Shapiro, and Collet (2015) assessed the long-term efficacy and safety risks associated with the use of cannabis over a 1-year period, which they state is the first cohort study of its kind. They found that cannabis use over the 1-year period was associated with a reduction in the sensory component of pain, an improvement in the total symptom distress score of the Edmonton Symptom Assessment Scale, and a significant improvement in the total mood disturbance scale of the Profile of Mood States (Ware et al., 2015). They also found no significant increase in serious adverse events between the control and medical cannabis groups but did find an increase in the number of non-serious adverse events, which included headache, nasopharyngitis, nausea, somnolence, and dizziness (Ware et al., 2015).

Even so, one important adverse event that is absent in the studies by Whiting et al. and Ware et al. is death due to cannabis overdose. Along with these two studies, a recent NASEM (2017b) report found no sufficient evidence to support or refute the claim that there is a significant link between cannabis use and death due to overdose. Therefore, since cannabis has shown to be an effective analgesic and has not shown to be significantly associated with death due to overdose as opioids have, it is important to determine the public’s opinion regarding its use. This is because the usefulness of cannabis as an opioid substitute is limited if an overwhelming portion of the population does not believe it should be available for medicinal use.

### ***Public Opinion and Media***

According to a 2017 Pew Research Center survey of a nationally representative sample, roughly 6 out of every 10 Americans (61%) believe marijuana should be legalized (Hartig & Geiger, 2018). Not only was this percentage up 4% from the previous year, but it was also nearly double that from 2000, which was 31% (Hartig & Geiger, 2018). The survey also showed that almost all generations support the legalization of marijuana, with the Silent Generation (people born between 1928-1945) being the only one opposed (Hartig & Geiger, 2018). Based off this data, it appears the majority of Americans support the legalization of cannabis, not only for medicinal purposes, but for recreational use as well; however, future surveys should make the distinction of whether the participants believe it should be legalized for medical use, recreational use, both, or neither. Even so, based on this nationally representative survey, it appears the majority of Americans support the use of cannabis. It is then important to determine the relationship between certain variables that either influence or are influenced by public opinion on cannabis use.

One such variable is media, which studies have shown is correlated to public opinion on a variety of issues. For example, Pearl, Puhl, and Brownell (2012) found that participants who viewed positive images of obese models had less of a negative attitude towards the models than those who viewed stigmatized images. In another study, Young, Norman, and Humphreys (2008) found that infectious diseases which received more media coverage were perceived as being more severe than diseases with similar objective severity but had received fewer media coverage. Based on these studies, media and public opinion have shown to be correlated to one another. Therefore, the purpose of this study is to determine the relationship between media and public opinion regarding cannabis as an opioid substitute. Specifically, this study will determine the relationship between the primary media source individuals between the ages of 18 and 30 use

and what their opinions are towards the use of cannabis as an opioid substitute. Since this is such a controversial and pressing issue in society, politics, and the field of medicine and rehabilitation, research into the opinions of young individuals—the voters of tomorrow—is imperative and could foreshadow future changes to laws and procedures involving the prescription rate of both cannabis and opioids.

Our hypotheses are as follows: (1) The majority of participants will believe opioids are more addictive and more harmful to one's health than cannabis; (2) The primary media source someone uses will be significantly correlated to their opinion on the use of cannabis as an opioid substitute.

### ***Rationale for Current Study***

Determining the relationship between media and public opinion regarding cannabis and opioids is important because it could suggest certain media sources provide biased information about this topic. While there has been research into public opinion about opioids and cannabis, the literature around the relationship between the primary media source someone uses and their opinion concerning the use of cannabis as an opioid substitute is lacking. Therefore, this study will examine public opinion regarding the use of cannabis as an alternative to opioids. However, it is important to note that this study cannot prove a causal or directional relationship because no variable will be manipulated by the researchers. As a result, this study's main purpose is to discern if future research into this topic is warranted.

## **Methods**

### ***Study Design***

An online survey was created and approved by the Institutional Review Board (IRB) before data collection began. Once approved, the survey was administered to participants

through Qualtrics. Participants accessed the survey using the link provided to them by various faculty members. After the participants completed the survey, their responses were recorded and stored by Qualtrics.

### *Participants*

Participants (n=134) consisted of college students from who were between 18 and 30 years old. All participants were recruited via emails from faculty. The demographic breakdown of the participants is reported in Table 1.

Table 1. Participant demographic information.

<b>Gender</b>	<b>Age</b>	<b>Race</b>	<b>Religion</b>	<b>Political Party</b>
<b>Male</b>	<b>18 Years Old</b>	<b>White</b>	<b>Christianity</b>	<b>Democrat</b>
24	23	80	102	38
<b>Female</b>	<b>19 Years Old</b>	<b>Black / African American</b>	<b>Hinduism</b>	<b>Republican</b>
110	23	25	7	52
	<b>20 Years Old</b>	<b>Asian/Pacific Islander</b>	<b>Judaism</b>	<b>Independent</b>
	35	21	2	13
	<b>21 Years Old</b>	<b>Hispanic</b>	<b>Islam</b>	<b>None</b>
	24	6	5	28
	<b>22 Years Old</b>	<b>Mixed</b>	<b>Other</b>	<b>Other</b>
	11	3	18	3
	<b>23-29 Years Old</b>			
	18			

### *Survey*

An online survey was created using the service Qualtrics. The first section of the survey included demographical questions about age, gender, race/ethnicity, current academic class

standing, religion, the region of the United States in which the participant was raised, and political party affiliation.

The next section included questions about media consumption. The participants were asked what they use as their primary media source (e.g., CNN, Fox News, Social Media, etc.); how much time they spend per day on their primary media source; and what their closest family member(s) use(s) as their primary media source. This section also included questions that asked participants to rank their level of support on a 5-point Likert scale—1 being strongly disagree and 5 being strongly agree. The questions included whether the participants believe their primary media source has the potential of providing biased information; if their primary media source can influence their opinion on cannabis and/or opioids (asked as two separate questions); and if the primary media source their closest family member(s) use(s) can influence their opinion on the use of cannabis and/or opioids (again, asked as two separate questions). However, they were not asked these last two questions about their family members if they answered “Unsure” for the question regarding which primary media source their closest family member(s) use(s). This was done to avoid any guessing done by the participants, which could have potentially skewed the results.

Furthermore, the participants were asked about their opinion regarding cannabis and opioids. They were asked if they have ever taken a prescription opioid before; if they believe there is an issue with the prescription rate of opioids in the United States; which one they believe is more addictive; which one they believe is more harmful to one’s health; if one, both or neither should be available to patients through prescription; and if one, both, or neither should be available over-the-counter. Lastly, the participants were asked to rank their level of support for

the use of cannabis as an opioid substitute on a 5-point scale from “strongly do not support” to “strongly do support”.

### *Statistical Analysis*

The data was analyzed in Excel using Chi-square and Pearson correlation tests to determine the relationship between media and public opinion regarding cannabis as an opioid substitute, as well as the participants’ overall opinion regarding opioids and cannabis. Chi-square testing was used because it is the commonly accepted form of analysis for comparing categorical data to determine how well the observed data aligns with the expected data that would be seen if the categorical variables are independent of one another (Statistics Solutions, n.d.). Additionally, Pearson correlation testing was used to test if there was a linear relationship between any of the variables.

## **Results**

### *Opinion on Cannabis and Opioids*

As shown in Table 2, the majority of participants responded with opioids when asked which analgesic drug they believe is more addictive and harmful to one’s health.

Table 2. Participant responses when asked if they believe opioids or cannabis is more addictive and more harmful to one’s health.

<b>More Harmful</b>	<b>More Addictive</b>
<b>Opioids</b>	<b>Opioids</b>
114 (85%)	103 (77%)
<b>Cannabis</b>	<b>Cannabis</b>
8 (6%)	6 (4%)
<b>Unsure</b>	<b>Unsure</b>
12 (9%)	25 (19%)

Binomial distribution was used to test the probability of seeing a sample such as this one. If the “unsure” responses are excluded, the probability of having 114 out of 122 individuals respond saying they believe opioids are more harmful than cannabis is  $1.81 \times 10^{-25}$ . Furthermore, the probability of having 103 out of 109 individuals respond saying they believe opioids are more addictive than cannabis is  $3.12 \times 10^{-24}$ . Given such low probabilities, it is nearly impossible that this data is of random chance. Therefore, we conclude that the number of participants who answered opioids for the previously mentioned questions is not only significant but also a substantial majority of the responses.

Participants were also asked to rank their support for the use of cannabis as an opioid substitute. Their responses are reported in the following table:

Table 3. Participants' responses when asked to rank their level of support for the use of cannabis as an opioid substitute.

Strongly Do Not Support	Do Not Support	Neutral	Support	Strongly Do Support
5 (4%)	16 (12%)	37 (27%)	47 (35%)	29 (22%)

As reported in Table 3, the majority (57%) of participants supported or strongly supported the use of cannabis as an opioid substitute, while only 16% were against it.

### ***Media vs Opinion on Cannabis as an Opioid Substitute***

Chi-square testing and bivariate analysis were both used to test if there is a significant relationship between the primary media source someone uses and their opinion on the use of cannabis as an alternative to opioids as an analgesic medication. For both forms of analysis, media was divided into two separate categories, traditional media and social media. Traditional media consisted of Fox News, CNN, NBC, MSNBC, ABC, NPR, radio stations, national

newspapers, and local newspapers; while social media consisted of Facebook, Twitter, Instagram, and YouTube.

Table 4. The primary media sources the participants use, as well as their opinions on the use of cannabis as an opioid substitute.

	Strongly Do Not Support	Do Not Support	Neutral	Do Support	Strongly Do Support	Total
Traditional Media	2	7	16	15	10	50
Social Media	3	9	21	32	19	84
Total	5	16	37	47	29	134

Neither chi-square ( $\chi^2 = 1.540$ ,  $df = 4$ ,  $p = 0.82$ ) nor Pearson correlation ( $r = 0.079$ ) tests showed any significant relationship between media and opinion on cannabis as an opioid substitute. Therefore, we conclude that there is not a significant relationship between the media source an individual uses and his/her opinion on the use of cannabis as a substitute for opioids as an analgesic medication.

### Conclusion

The primary intent of this study was to determine if the primary media source an individual uses affects his or her opinion on the use of cannabis as an opioid substitute. After conducting chi-square and Pearson correlation tests to analyze 134 survey responses, we found that the primary media source participants used was not significantly correlated to their opinion regarding the use of cannabis as an opioid substitute. However, we did find that the majority of participants believed opioids are more harmful and more addictive than cannabis. Furthermore, we also found that the majority (57%) of respondents do support the use of cannabis as an opioid

substitute. Therefore, we conclude that there is evidence to suggest (1) media and public opinion on the use of cannabis as an opioid substitute are not significantly correlated to one another; (2) a majority of the population believes cannabis should be available as an alternative to opioids for pain relief; and (3) a significant majority of the population believes opioids are more addictive and more harmful than cannabis.

### **Discussion**

Based on our results, we concluded that a majority (57%) of the population support the availability of cannabis as an opioid substitute for analgesic purposes. This is in agreement with other studies that also tested the public's opinion on cannabis and opioids. For example, the previously cited 2017 Pew Research Center survey found that roughly 6 out of every 10 Americans (61%) believe marijuana should be legalized (Hartig & Geiger, 2018). Since our results are similar, it helps further validate the theory that a growing majority of Americans are in support of cannabis use for pain relief.

We also concluded that the media source an individual uses is not significantly correlated to their opinion regarding the use of cannabis as an alternative to opioids due to the fact that almost all respondents shared roughly the same opinion on the dangers of opioid use. While it was not the focus of our research, we also determined if gender, political party affiliation, age, or religion are significantly related to opinion on cannabis as an opioid substitute. After conducting chi-square and Pearson correlation tests, we found no significant relationship between any of the aforementioned variables and opinion on cannabis as an alternative to opioids.

Additionally, for our analysis, we broke media into two separate categories; traditional media (e.g., Fox News, ABC, etc.) and social media (e.g., Facebook, Twitter, etc.). One possible alteration to our research that should be conducted in the future would be to use each individual

media source instead of grouping them into broad categories. Our rationale for grouping media sources into categories in this study was due to the small number of responses. Since the vast majority of participants chose social media as their primary media source (84 of 134 responses), none of the individual traditional media sources had a significant number of selections—Fox News had the most with 15. Consequently, they were grouped into one category so that we could conduct a reliable analysis.

Furthermore, one area of concern is that, while not every participant chose social media as their primary source of information, it is unlikely that they do not use it at all. Therefore, social media might still influence their opinion on cannabis as an opioid substitute even though they use another media source more often. Thus, our findings might have been affected, but unfortunately, there is no way of knowing given the questions asked in our survey.

Lastly, there is ample opportunity to expand upon our research. Future studies should test if our findings are similar to those seen in other populations besides college students between the ages of 18 and 30. For example, even though college students may be the voters of tomorrow, the Silent/Greatest generation (people born before 1945) and Baby Boomer generation (1946-1964) had the highest voter turnout for the 2016 election, while the Millennial (1981-1996) and Post-Millennial (after 1997) generations had the smallest voter turnout (Fry, 2018). Therefore, it is important to know if our findings hold true for those generations. Since older individuals may use different media sources and have varying opinions than college students, it is reasonable to suspect that our findings may have been different if we researched an older population. Likewise, the same issue arises with a younger population.

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