HOW TEXANS STOP PAIN WITH A PLANT: FINDINGS FROM A SURVEY OF MEDICAL CANNABIS USERS

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Executive Summary

With the passage of the Compassionate Use Act in 2015, the state of Texas officially recognized that cannabis is medicine. Still, the vast majority of Texas patients are excluded from participating in the Compassionate Use Program (CUP) due to restrictions in the state's law. Our recent survey of 2,866 Texas residents who use medical cannabis sought to gain insight into the needs and experiences of this population. The survey was conducted online between August 11, 2020, and October 6, 2020, and recruited participants through medical cannabis patient networks. Twenty-two percent of respondents were military veterans.

Key Findings

- 22% of respondents reported that medical cannabis has decreased pain (517 respondents, N=2,302).[a]
- 39% reported that medical cannabis has improved quality of life (900 respondents, N=2,302).
- 61% reported having replaced prescription opioids and benzodiazepines with medical cannabis (988 respondents, N=1,622).
- 80% of respondents reported using cannabis for chronic pain (2,006 respondents, N=2,501).
- 52% of veteran respondents reported using cannabis for PTSD (299 respondents, N=579).
- 18% of respondents said they use illicit cannabis to treat neuropathy, despite this diagnosis making them eligible for the CUP (468 respondents, N=2,558). Respondents also reported using cannabis for multiple sclerosis, autism, and Parkinson's, all covered by the CUP.
- 64% of respondents who purchase medical cannabis from the illicit market reported spending between $100 and $500 per month (1,249 respondents, N=1,937).
- 48% of respondents who purchase cannabis through out-of-state medical markets reported spending between $100 and $500 per month (255 respondents, N=536).
- 84% of respondents have considered leaving Texas for a state with a more inclusive medical cannabis program (2,033 respondents, N=2,409).

Policy Recommendations

1. Expand the Compassionate Use Program's qualifying conditions and move to a system in which program eligibility is based on both symptoms and diagnoses.
2. Remove the cap on THC content. Allow doctors and patients to determine the optimal strength and dosage for each individual's medical needs.
3. Revise the state's current regulatory scheme so that program oversight rests with qualified medical professionals who can adjust program guidelines in response to evolving research and other relevant considerations.

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[a] N = number of respondents. Due to the sensitive nature of the subject matter, respondents were able to skip questions. This results in variation in sample size across survey questions.

4. Provide legal protections against discrimination and denial of benefits in areas including but not limited to employment, health care, housing, education, and parental rights for individuals who use medical cannabis.
5. Make possession of small amounts of cannabis flower and concentrates for personal use a fine-only offense, to avoid criminalizing patients.

Introduction

On June 14, 1915, El Paso, Texas, became the first city in the United States to criminalize cannabis. The city council voted to outlaw "the deadliest drug on the market" two years after unsupported claims arrived from Mexico that cannabis was responsible for the stabbing of two police officers in the city of Juarez.[1] The false reporting of this incident, emblematic of the media's sensationalized coverage of cannabis at that time, incited public fears that coincided with hostilities toward Mexicans to culminate in the plant's prohibition. Other cities, and eventually the entire country, followed El Paso's lead; by 1937, cannabis was prohibited in all 48 states.[2]

Cannabis policy today looks much different than it did a century ago. Fifteen states now permit adults to buy and sell cannabis for adult use, and 36 states allow its use for medical purposes.[3] In El Paso, individuals found in possession of cannabis can be issued a citation instead of being taken to jail.[4] Texas' Compassionate Use Act, passed in 2015 and expanded in 2019, allows patients with certain qualifying conditions to access low-THC cannabis.[5] A state that once issued life sentences to people for possessing and selling cannabis now recognizes this plant as medicine.[6] Still, Texas clings to prohibition. Cannabis use not sanctioned by the Compassionate Use Program (CUP) remains a misdemeanor under state law, even as localities increasingly choose to reduce or cease enforcement, and the limitations of the CUP on qualifying conditions and permitted THC content (capped at .5%) exclude the majority of Texans who stand to benefit from medical access.[7] *Indeed, Texas has one of the most restrictive low-THC medical programs in the nation.[8] Those Texans who choose to use cannabis medicinally in spite of state restrictions are engaging in behavior that is technically "criminal" but is sanctioned, regulated, and taxed in 36 other states, including all states bordering Texas.*

The illegality of medical cannabis in Texas is an obstacle to understanding the motivations and impacts of medicinal use. To address this gap in knowledge, co-author Viridiana Edwards designed a survey to ask Texans about their medical cannabis use. This report provides a description and analysis of the survey findings and recommendations for how lawmakers can improve cannabis policy to better address the needs of state residents.

Data and Methods

This research builds upon Edwards' 2019 study that examined the reasons U.S. veterans use medical cannabis.[9] The current study consisted of an online survey using Qualtrics software. The population of interest was Texas residents who use medical cannabis. The link to the questionnaire was distributed primarily through the Foundation for an

Informed Texas and its affiliated organizations, including Texas Veterans for Medical Marijuana Access and the Texas chapter of the National Organization for the Reform of Marijuana Laws (NORML). These organizations provided an effective avenue for reaching Texas residents who use medical cannabis.

Survey respondents were guaranteed anonymity in view of the private and illicit nature of the subject matter. Online anonymous surveys are effective when the target population is engaged in illegal activity, and this data collection method is used often by drug researchers.[10] The cross-sectional questionnaire was open for submissions from August 11, 2020, to October 6, 2020.

Veterans were intentionally over-sampled to better capture medicinal cannabis use in this population. Texas, home to 1.46 million veterans, has the second-largest veteran population in the U.S., after California.[11] The Texas veteran suicide rate was 32 per 100,000 people in 2018, significantly higher than the state's overall suicide rate of 17.6 per 100,000 people.[12] Post-traumatic stress disorder (PTSD) is linked to suicide in veterans. Research suggests that cannabis can decrease PTSD symptoms, and several states include PTSD as a qualifying condition for medical cannabis programs.[13] Texas does not; lawmakers rejected an opportunity to add PTSD to the CUP's list of qualifying conditions in 2019.

Respondents were asked a series of questions about their cannabis use. This report focuses on medical conditions for which respondents started using cannabis, the relationship between cannabis use and other aspects of respondents' health care, the impact of cannabis use on daily life, and cannabis purchasing practices. Due to the personal nature of the subject matter, respondents were able to skip questions they did not want to answer.

Surveys that rely on self-reported data from respondents can reflect social desirability bias. The intentional targeting of individuals who use cannabis includes the understanding that respondents are inherently likely to hold positive attitudes toward cannabis use and that their views that cannabis has improved their health are based on subjective perceptions rather than objective measures. That said, self-reports are valuable for the insight they provide into the reasons for and effectiveness of cannabis use as perceived by individual users.

Findings

Respondent Demographics

The survey sample included 2,223 civilians and 643 veterans, for a total sample size of 2,866 (see Table 1).[14] Veterans made up 22% of the sample. Males comprised 57% of the total sample but 82% of veteran respondents, consistent with the higher frequency of males in the veteran population. Veteran respondents were also likely to be older (47% were age 45 and older), retired (37%), and report higher annual income compared to civilian respondents.

Forty-seven percent of civilians reported receiving an associate degree or higher, compared to 60% of veterans. While 59% of civilians reported that they were employed

(42%) or self-employed (17%), 53% reported making less than $35,000 per year, indicating that employment among this population may be concentrated in low-income professions. White individuals were overrepresented in the survey, comprising 63% of the sample compared to approximately 42% of the Texas population. The overrepresentation of respondents who identified as white (non-Hispanic) could be a residual effect of racially disparate enforcement of cannabis prohibition.[15] Non-white individuals may have been less willing to participate in the survey because of greater fear of repercussions for discussing illegal activity. The survey distribution method, which relied on cannabis reform groups for dissemination, also may have been less likely to reach minorities, who may be less likely to connect with or be active in such groups due to concerns about potentially negative consequences stemming from this engagement.

The survey sample includes residents from 441 cities and towns across the state, including large metropolitan areas and rural counties. El Paso is overrepresented, accounting for 14% of respondents' place of residence. There are a few possible reasons for this. El Paso state legislators have been active in filing and championing cannabis reform bills, making it a common news topic in the area and likely bolstering awareness and involvement.[16] The El Paso chapter of NORML, which worked to distribute the survey, has an especially prominent social media presence. It is also possible that the target population was motivated to respond when they learned that a fellow El Pasoan (Edwards) was conducting the survey. Austin (8% of respondents' reported place of residence), Houston (6%), San Antonio (6%), and Dallas (5%) round out the top five places of residence among survey respondents.

Table 1. Respondent Demographics[i]

	Civilians	Veterans	Total
Sex			
Male	1,131 (51%)	524 (82%)	1,655 (57%)
Female	1,049 (47%)	111 (17%)	1,160 (41%)
Decline to Answer	42 (2%)	8 (1%)	50 (2%)
Total	2,222 (100%)	643 (100%)	2,865 (100%)
Age			
18-24 years old	248 (11%)	2 (0%)	250 (9%)
25-34 years old	606 (27%)	131 (20%)	737 (25%)
35-44 years old	530 (23%)	209 (33%)	739 (25%)
45-54 years old	366 (16%)	115 (18%)	481 (17%)
55-64 years old	343 (15%)	104 (16%)	447 (16%)

65-74 years old	119 (5%)	69 (11%)	188 (7%)
75-84 years old	5 (<1%)	13 (2%)	18 (1%)
85 years or older	5 (<1%)	0 (0%)	5 (<1%)
Total	2,222 (100%)	643 (100%)	2,865 (100%)

Race/Ethnicity (Respondents Could Select More than One Response)

Asian	24 (1%)	13 (2%)	37 (1%)
Hispanic/Latino	637 (26%)	129 (17%)	766 (24%)
Black/African American	114 (5%)	63 (8%)	177 (5%)
White	1,551 (63%)	472 (63%)	2,023 (63%)
American Indian or Alaskan Native	76 (3%)	39 (5%)	115 (4%)
Native Hawaiian and Pacific Islander	7 (<1%)	8 (1%)	15 (<1%)
Other race/ethnicity	65 (3%)	27 (4%)	92 (3%)

Employment Status (Respondents Could Select More than One Response)

Employed	1,057 (42%)	198 (27%)	1,255 (38%)
Unemployed	324 (13%)	54 (7%)	378 (12%)
Retired	248 (10%)	272 (37%)	520 (16%)
Student	173 (7%)	54 (7%)	227 (7%)
Self Employed	415 (17%)	76 (10%)	491 (15%)
Other	291 (11%)	90 (12%)	381 (12%)

Est. Annual Income

Less than $20,000	657 (30%)	81 (13%)	738 (26%)
$20,000-$35,000	501 (23%)	110 (17%)	611 (21%)
$36,000-$55,000	432 (20%)	177 (28%)	609 (21%)
$56,000- $75,000	254 (12%)	129 (20%)	383 (13%)
$76,000 or more	365 (17%)	144 (22%)	509 (18%)
Total	2,209 (100%)	641 (100%)	2,850 (100%)

Education Level

Less Than High School Diploma	61 (3%)	0 (0%)	61 (2%)
High School Diploma or Equivalent	797 (36%)	160 (25%)	957 (33%)

Certificate Program	344 (15%)	87 (14%)	431 (15%)
Associate Degree	371 (17%)	176 (27%)	547 (19%)
Bachelor's Degree	484 (22%)	148 (23%)	632 (22%)
Master's degree	129 (6%)	53 (8%)	182 (6%)
Ph.D., J.D.	36 (2%)	16 (2%)	52 (2%)
Total	2,222 (100%)	640 (100%)	2,862 (100%)

[i]Respondents could skip questions.

Medical Reasons for Illicit Cannabis Use

Table 2 lists the 10 most frequently reported diagnosed conditions that respondents treated with medical cannabis. The high frequencies of responses for the conditions listed in Table 2 indicate that many survey participants experienced multiple issues simultaneously. These findings and their implications are discussed below.

Table 2. Ten Most Common Medically Diagnosed Conditions Respondents are Treating with Cannabis (N=2,558)[i,ii]

	Civilians (N=1,979)	Veterans (N=579)	Total (N=2,558)
Anxiety	1,533 (77%)	454 (78%)	1,987 (78%)
Depression	1,198 (61%)	420 (73%)	1,618 (63%)
Back pain	1,032 (52%)	383 (66%)	1,415 (55%)
Sleeping disorders	893 (45%)	325 (56%)	1,218 (48%)
Migraines or headaches	708 (36%)	299 (52%)	1,007 (39%)
Post-Traumatic Stress Disorder	506 (26%)	299 (52%)	805 (31%)
Attention Deficit Hyperactivity Disorder (ADHD)	471 (24%)	96 (17%)	567 (22%)
Neuropathy	356 (18%)	112 (19%)	468 (18%)
Restless Leg Syndrome	320 (16%)	96 (17%)	416 (16%)
Substance use disorder	276 (14%)	131 (23%)	407 (16%)

[i] Respondents could list more than one diagnosed condition. [ii] Respondents could skip questions.

Among both civilian and veteran respondents, anxiety was the most frequently cited medically diagnosed condition that cannabis was used to treat (78% of all respondents). Depression was the second most common (63% of all respondents). Back pain was the third most diagnosed condition, with 55% of respondents reporting using it for this purpose. Back pain is one of the most common forms of chronic pain, a catch-all term that refers to pain in various parts of the body, such as in one's nerves and joints, and which encompasses the pain symptomatic of common autoimmune disorders like rheumatoid arthritis and multiple sclerosis.[17] A separate survey question that asked respondents about the symptoms they use cannabis to treat found that 80% used it for chronic pain.[b]

Nearly half of all respondents (48%) reported using cannabis for sleeping disorders and over one-third (37%) reported using it for migraines or other headaches. Sixteen percent of all respondents, and 23% of veteran respondents, reported using cannabis for substance use disorders. This finding is consistent with large numbers of anecdotal reports from individuals for whom cannabis has served as an "exit drug" from other substance use.[18]

A higher percentage of veterans reported using cannabis for all conditions listed in Table 2 except attention deficit hyperactivity disorder, which may be due to the older average age of the veteran sample. Higher rates of cannabis use among veterans for conditions such as back pain and sleeping disorders may also be attributed to the older age of this sample, or they could be a byproduct of veterans' experiences while serving in the military. To that point, *over half of veteran respondents (52%) reported using cannabis to treat PTSD, compared to 26% of civilians.* The prevalence of PTSD and related symptoms is strongly associated with combat experience. Symptoms include depression, anxiety, and difficulty sleeping, all of which the majority of veteran respondents reported using medical cannabis to treat.

Eighteen percent of respondents reported using cannabis for neuropathy, a neurogenerative disease that causes chronic pain and is already listed as qualifying under the state's Compassionate Use Program.[19] Smaller numbers of respondents reported using cannabis for multiple sclerosis (52 respondents), autism (45 respondents), and Parkinson's disease (15 respondents), all CUP-qualifying conditions. This suggests that the program's various limitations, including the low THC cap, make it ineffective for many people it is intended to help. Several of the most frequently reported conditions, including PTSD, migraines, and back pain, are included in other states' cannabis programs, as are a number of other ailments reported by respondents, including irritable bowel syndrome (326 respondents), fibromyalgia (275 respondents), rheumatoid arthritis (255 respondents), Crohn's disease (93 respondents), glaucoma (69 respondents), and lupus (69 respondents).[20]

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[b] 2,006 out of 2,501 respondents (1,590 civilians and 416 veterans) reporting. Symptoms are subjective experiences, whereas diagnoses are objective assessments typically based on observable signs and symptoms reported by patients. For a full list of responses to questions about diagnosed conditions and symptoms being treated with medical cannabis see online supplemental information.

It is also important to note that 15% of respondents reported using cannabis to treat bipolar disorder. There is moderate evidence that regular cannabis use can increase symptoms of mania associated with bipolar disorder in people who already have the illness (there is no evidence that cannabis use *causes* bipolar disorder).[21] We do not know how frequently respondents who reported having bipolar disorder consume cannabis, nor do we know their diagnostic history or their understanding of the effects of cannabis use on their mental health. But the fact that 15% of survey respondents were using cannabis to treat a condition for which its use may be contraindicated underscores the need for evidence-based, widely disseminated information about cannabis use and mental health, as well as for individuals to feel comfortable consulting with their doctors about cannabis use—a need that, as we detail further below, is inhibited by the state's prohibition of cannabis.

The conditions that medical cannabis users in this survey most frequently suffered from involve chronic physical or mental pain or distress. Such illnesses are pervasive in the U.S. population. Chronic pain affects an estimated 50 million Americans each year.[22] Anxiety affects roughly 40 million people aged 18 or older annually.[23] Nearly 20 million adults suffered a major depressive episode in 2019, with tens of millions more experiencing mild to severe cases.[24] That same year, nearly 18 million adults had a substance use disorder involving alcohol or drugs other than cannabis.[25] Often these conditions overlap. There is a high rate of co-occurrence between chronic pain and PTSD, and both can cause and exacerbate anxiety and depression.[26] Mental illness and chronic pain increase the likelihood of developing a substance use disorder.[27] The frequency of co-occurrence for many of these ailments, illustrated in the survey findings presented here, complicates diagnosis and treatment and increases the need for access to viable therapeutic alternatives.

Medical Cannabis Use and Prescription Medications

Given the numerous and often severe conditions that respondents reported using medical cannabis to treat, it is not surprising that the majority of them also reported taking prescription medications. Respondents were asked how cannabis had impacted their use of prescribed medications. Consistent with prior research, some respondents reported that cannabis increased the effectiveness of their medications at lower doses, thus allowing them to avoid unpleasant side effects that accompany higher doses of some prescription drugs.[28] One respondent, for example, reported using cannabis in conjunction with medications prescribed for Crohn's disease:

> "I use Imuran, Stelara, for long term severe Crohn's disease. They weren't working for me alone but with the addition of a 1:1 cannabis oil, with very little THC, I am now in remission and able to avoid surgery."

Another respondent reported being able to reduce the dosage of Tramadol, an opioid painkiller, after adding cannabis to their treatment regimen:

> "I still use Tramadol, but I only take 100mg a day instead of prescribed 300mg a day. I use 5mg THC/CBD twice a day, and I use cannabis flower at night."

While some respondents reported using cannabis as a treatment supplement, far more reported that cannabis has completely replaced some prescribed medications. Table 3 lists the categories of pharmaceutical medications that respondents reported discontinuing after turning to medical cannabis, with opioids, anti-depressants, and benzodiazepines the most common.[29]

Table 3. Most Frequently Reported Discontinued Medications (N=1,622) [i,ii]

	Civilians (N=1,260)	Veterans (N=362)	Total (N=1,622)
Prescription opioids	483 (38%)	175 (48%)	658 (41%)
Anti-depressants	327 (26%)	112 (31%)	439 (27%)
Benzodiazepines	280 (22%)	50 (14%)	330 (20%)
Muscle relaxers	94(7%)	20 (6%)	114 (7%)
Anti-epileptic drugs and nerve pain medications	68 (5%)	28 (8%)	96 (6%)
Sleep aids	57 (5%)	22 (6%)	79 (5%)
Stimulants	67 (5%)	8 (2%)	75 (5%)

[i] Respondents could list more than one response. [ii] Respondents could skip questions.

Prescription opioids were the most frequently reported discontinued medication among both civilians and veterans (41%), though a higher percentage of veterans (48%) reported ceasing use compared to civilians (38%). Several respondents reported experiencing greater relief from cannabis than from opioids:

> "My doctor refuses to put me in the hospital to take me off my prescription medication. I see a pain management doctor. I have advanced stage [o]steoarthritis with degenerative joint and disc disease. I only have 3 joints left of my own. Everything else has been replaced. The most recent surgery to my left shoulder. When I smoke it helps reduce my pain by 75% The meds only provide 25% relief. I also have severe Neuropathy and nerve damage pain."

> "I have been on every pain killer known to mankind. I no longer take pharmaceuticals. Marijuana controls my pain without affecting my ability to function. I vomited so much during the time I was on pills and patches, that my teeth died basically. Marijuana helps me function without pain."

> "Many [pain medications] just put me out of my head and into a strange space outside of it, sometimes incapacitating me just to numb pains I felt. However, with cannabis, in moderation (which is key!), I still feel in control and able to function."

> "Percocet, fentanyl & ultram [opioid painkillers] ... they made me high but cannabis helps the pain."

Twenty percent of respondents reported discontinuing use of benzodiazepines, a class of drugs with sedating effects that are prescribed for a range of issues, including anxiety, insomnia, and seizure control. Many reported stopping commonly prescribed benzodiazepines such as Xanax due to undesirable effects:

> "I discontinued the use of Xanax because of how 'zombie' like this medication made me feel and it also made me lose appetite. Cannabis helps me with my anxiety all while giving me appetite without feeling so druggy."

Twenty-two respondents used the word "zombie" to describe the effects of benzodiazepines and opioids, and 123 respondents specifically mentioned "side effects" as the primary reason for ceasing these drugs and antidepressants. Twenty-seven percent of respondents reported discontinuing antidepressants, often citing their ineffectiveness and unpleasant effects. For example, one respondent reported discontinuing

> "Various medications (Lamictal, Bupropion, Risperdal) for mental health that were not helping, led to weight gain and depression."

Medication side effects can intensify if patients have to increase their dosage in response to developing a physical tolerance. Several respondents reported needing higher doses of their medications over time to experience a sense of relief. One respondent described the diminishing returns associated with prescribed drugs:

> "Soma, Relafen, Vicodin, and Xanax. The side effects are detrimental to my mental & physical well-being. It got to the point of having to take larger amounts of prescribed medications to feel minimal of relief."

In addition to drug tolerance, physical dependence can accompany sustained use of opioids and benzodiazepines. Tolerance and dependence are not inherently problematic, but nonetheless can be discomforting, as some people may dislike feeling reliant on a medication or worry that physical dependence will lead to psychological addiction.[30] This was a concern among some survey respondents; 71 respondents mentioned addiction or dependence as reasons for discontinuing opioids and benzodiazepines. One respondent said they stopped taking opioids because they "don't want to die," likely a reference to the risk of overdose associated with these drugs.

The prevalence with which respondents replaced prescription opioids and benzodiazepines with cannabis has important implications against the backdrop of the overdose epidemic. Initially driven by prescription opioids, the epidemic has since evolved to include multiple drugs.[31] Some combinations, such as opioids, benzodiazepines, and muscle relaxers, are prescribed together for serious injuries, as well as for such conditions as PTSD, and are also commonly implicated in overdose deaths.[32] For individuals whose suffering is not relieved by prescription medications, medical cannabis may be a preferred and safer alternative.

Cannabis Use and Health Care Access

In addition to shortcomings of legally available treatments, the role of health care, or lack thereof, also emerged as a reason for medical cannabis use. One respondent explained the obstacles to receiving treatment from their health care provider:

> "I have no health insurance so my doctor limits what she will do for me. I have Tenosynovitis in my left thumb & hand/wrist pain due to my profession in massage therapy. I also have muscular pain and my doctor refused my last refill for Tramadol & since I'm not a 'sick' person, she deflects appts with me. Cannabis helps my pain, anxiety and is a life saver."

Several respondents, in their explanations for why they have discontinued prescription medications, cited affordability and insurance issues. One respondent ceased prescribed drugs because they were "too expensive without health insurance, which I have not had since I've been unemployed." Another discontinued Cymbalta, an antidepressant and nerve pain medication, because "mental healthcare sucks in TX. I wasn't receiving consistent care or meds. Can't just start and stop those meds willy-nilly." These qualitative data are consistent with the finding that 53% of civilian respondents reported making less than $35,000 a year, suggesting employment concentrated in low-income professions that may provide little or no insurance coverage.

For some respondents, then, cannabis is compensating for limitations in health care access. It is worth noting that over 18% of Texans are uninsured, twice the national average.[33] This suggests that Texans may be especially likely to view cannabis as an attractive medical treatment, regardless of its legal status, due to health care restrictions imposed by state policies and the relative affordability of cannabis compared to the cost of seeing a doctor and purchasing prescription drugs.

Even with insurance, patients may not have access to sufficient care. Many veterans receive insurance through their VA benefits, yet several veteran respondents expressed frustration with the services available to them. One respondent described their negative perceptions of VA-based care:

> "After seeing the absolute hell most of my peers go through at the VA and being given a 0% rating, I decided the VA was not a smart choice for treatment. Some of that assumption was based on how the active-duty psychiatrist would only push anxiety medications with no real treatment alternatives. I had used cannabis prior to my military experience and knew it was very calming. It took me a while to even realize I wasn't using it recreationally. I thought I had a good handle on my PTSD for the better part of the last 10 years. Since I got out my anxiety and anger issues have gotten worse. The cannabis helps me keep it under control."

Disclosure of Medical Cannabis Use

The majority of respondents (59%) reported speaking to a medical professional about their illicit cannabis use.[c] While encouraging, 41% of respondents reported that they do not discuss cannabis use with providers. Civilian respondents' rates of non-disclosure were higher, at 47%.[34]

Among the 41% of total respondents who reported not discussing cannabis use with their health care providers, the vast majority cited reasons related to fear of stigma or loss of access to medical care that could result from such disclosure. Common responses to an open-ended question asking about reasons for nondisclosure included variations of "afraid of prescription and insurance repercussions" from reporting illegal substance use and "legality of cannabis in Texas," with some respondents expressing concern that they would be "stigmatized" or "judged" by medical staff, including their physician.

These fears are not unfounded. Some respondents attributed discontinuation of prescription opioids to complications related to their cannabis use. One respondent reported ceasing opioid use after being "fired from pain mgmt. for testing positive for cannabis," and another explained discontinuing other medications because "my Texas Dr said he'd stop treating me if I ever test positive" for cannabis.

That a large minority of respondents reported not disclosing cannabis use to their health care providers is concerning. Given the chronic and serious diagnoses for which many of them reported using cannabis, professional medical guidance may be helpful, if not advisable. Cannabis is a complex and powerful plant, beneficial for a variety of ailments but also likely contraindicated for certain conditions and medications. ***Prohibition has not deterred Texans from using cannabis for medical purposes, but as findings from this survey suggest, it has created an obstacle to patients and doctors making fully informed health care decisions.***

Reported Effects of Medical Cannabis Use

A staggering 99% of respondents reported that medical cannabis has provided relief.[d] Medical cannabis users were the target of this survey, and it is reasonable to expect that individuals who use cannabis medicinally also find it satisfactory; nevertheless, this is an impressive degree of consensus.

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[c] 1,634 out of 2,788 respondents reporting. Fifty-three percent of civilians (1,091 out of 2,041 respondents) and 69% of veterans (514 out of 747 respondents) answered "yes" when asked, "Have you spoken with a medical professional about your cannabis use?"
[d] 2,135 out of 2,144 respondents reporting. Ninety-nine percent of civilians (1,627 out of 1,635 respondents) and 99% of veterans (508 out of 509 respondents) answered "yes" when asked, "Have you found relief with medical cannabis?"

Responses to an open-ended question asking about the impact of cannabis use further reveal that respondents experienced positive effects from this use. Narrative and content analysis were used to code responses and identify emergent themes.[35] The most common themes are reported in Table 4.[36]

Thirty-nine percent of respondents reported that cannabis has improved their overall quality of life and 36% said that it has improved social relationships. Another 22% said that it has decreased pain or discomfort. Other emergent themes centered on specific benefits to productivity in one's professional or educational capacity, improved mood, and higher activity levels. For many respondents, cannabis's effects were synergistic, bringing benefits to multiple aspects of life that positively reinforce each other. One respondent described in detail the many ways in which cannabis has changed life for the better:

> "Using cannabis has allowed me to have a much better quality of life without negative side effects or possible addiction. I am able to enjoy spending time with my grandchildren with much less pain and I am able to play games with them rather than be in a depressive state of mind. I am able to go out in public with less anxiety and enjoy eating at a restaurant occasionally. I do not have as many negative, depressed thoughts about life and being alive. I am able to go to sleep without the constant thoughts racing through my brain at night. I can lay down with less pain occurring throughout my body. I come from a law enforcement background, so it took a lot of research on my part before I 'jumped' on the medical cannabis bandwagon, but using cannabis medicinally has saved my life, physically, mentally, spiritually, and in my relationships."

Table 4. Most Common Ways that Cannabis has Changed Respondents' Life (N=2,302)[i,ii]

	Civilians (N=1,770)	Veterans (N=532)	Total (N=2,302)
Improved overall quality of life	646 (36%)	254 (48%)	900 (39%)
Improved relationships (familial, social, romantic)	443 (25%)	385 (72%)	828 (36%)
Decreased pain or discomfort	362 (20%)	155 (29%)	517 (22%)
Improved productivity in school/job capacity	362 (20%)	151 (28%)	513 (22%)
Improved mood	212 (12%)	96 (18%)	308 (13%)
Improved activity levels	230 (13%)	63 (12%)	293 (13%)

[i]A single response could be coded for multiple themes; for example, a respondent might say that cannabis has both decreased pain and improved relationships. [ii]Respondents could skip questions.

The vast majority of respondents recounted positive effects of cannabis use. A minority of respondents, 117 people, reported negative effects, related primarily to cannabis's illegal status rather than direct effects of use. Some respondents, for example, experienced trouble with law enforcement in the past and said they were now "living in fear" of law enforcement. Similarly, respondents reported limited employment opportunities due to legal troubles as well as drug testing requirements. One respondent reported being unable to find employment despite having an "advanced education" because "I got caught up with a cannabis cartridge, now have a pending felony. Finding a job is nearly impossible, it's about time to move because of it."

Medical Cannabis Purchasing Practices

Texans who use cannabis medicinally, unless they qualify for the Compassionate Use Program and benefit from low-THC products, must rely on the illicit market or travel outside the state to secure access. Respondents were asked about the frequency with which they use both markets and how much they spend on cannabis purchases.

Illicit Market Purchases. Two-thirds of survey respondents reported buying their cannabis through the illegal market.[e] The most common buying practice, reported by 64% of respondents, was to purchase cannabis products monthly and to spend between $100 and $500 per transaction.[f]

Out-of-State Purchases. Nineteen percent of respondents reported buying their cannabis products through nine different out-of-state medical cannabis programs.[g] The vast size of Texas likely makes travel to other states inconvenient for individuals who do not live near the border, but for those who do have access, out-of-state medical cannabis programs almost certainly offer greater quality and predictability than Texas' illicit market.

Out-of-state purchasing patterns were similar to illicit market trends, with 48% of respondents reporting monthly purchases of $100 to $500.[h] Purchasing cannabis monthly through either market may be perceived as the most convenient buying practice.

Twenty-one percent of respondents who make out-of-state purchases reported having a medical card authorizing them to purchase cannabis in New Mexico.[i] The relative popularity of the New Mexico market with survey respondents is likely due to its status as the Texas border state with the most inclusive medical cannabis program, although we note that all states bordering Texas have more robust programs.[37] El Paso, where 14% of survey respondents live, is less than 10 miles from the New Mexico border.[j] California and Colorado were the second– and third–most common sources for medical cannabis,

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[e] 1,937 of 2,866 respondents (1,484 civilians and 453 veterans) reporting.
[f] 1,249 out of 1,937 respondents (967 civilians and 282 veterans) reporting
[g] 536 out of 2,866 respondents (412 civilians and 124 veterans) reporting.
[h] 255 out of 536 respondents (199 civilians and 56 veterans) reporting.
[i] 113 of 536 respondents (84 civilians and 29 veterans) reporting.
[j] 389 of 2,866 respondents (344 civilians and 45 veterans) reporting.

respectively; 15% of out-of-state shoppers reported having a California medical card and 13% said they have one in Colorado.

The dominant spending practice identified by this survey is for patients to spend between $100 and $500 per month, either on illicit or out-of-state purchases. This spending pattern is largely consistent with other research that shows that patients residing in states with broader medical programs spend an average of $240 per month.[38] The number of patients per medical cannabis program varies considerably by state, but on average medical cannabis states report a patient population of approximately 3.7% of their total population.[39] *An expanded medical cannabis program in Texas, then, could result in over 1.08 million participating patients. Using a very conservative estimate of $1,200 annual spending per patient, this translates into roughly $1.3 billion in sales per year.*

Industry actors in legal medical states likely recognize the potential of the Texas market. For example, one New Mexico dispensary with multiple locations reported having 352 patients from El Paso County at a single branch. Those patients spent nearly $105,000 in a three-month period (July-September) in 2020, which translates into over $400,000 in annual sales for that dispensary alone.[40] On October 20, 2020, Colorado Governor Jared Polis took to Twitter to humorously discourage Texas from legalizing cannabis due to the loss of potential tax revenue from Texas tourists.[41]

The exclusivity of Texas' Compassionate Use Program has forced individuals to seek medical cannabis outside the state-sanctioned system, either on Texas' illicit market or in other states' legal markets. This creates considerable risks, costs, and inconveniences for patients, and is a missed opportunity for the state, which could be reaping the economic benefits of a prosperous and taxable medical cannabis industry. *Due to the CUP's restrictions, 84% of survey respondents said they have considered leaving Texas for a state that has a more inclusive medical cannabis program.[k]*

Recommendations

The findings from this survey are consistent with prior observations that the Texas Compassionate Use Program's restrictiveness renders it ineffective for many Texans who could benefit from access to legal medical cannabis.[42] Based on survey findings, an extensive review of medical cannabis programs in other states, and the available scientific literature, we recommend that state officials take the following steps to improve Texas' medical cannabis policy:

1. *Expand the Compassionate Use Program's qualifying conditions and move to a system in which program eligibility is based on both symptoms and diagnoses.*

   Several of the symptoms and diagnoses that survey respondents reported using cannabis to treat, including chronic pain, PTSD, irritable bowel syndrome (IBS),

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[k] 2,033 out of 2,409 respondents (1,587 civilians and 446 veterans) reporting.

fibromyalgia, rheumatoid arthritis, Crohn's disease, glaucoma, and lupus, are considered qualifying conditions by most medical cannabis programs. Chronic pain, reported by 80% of respondents, is a qualifying condition in at least 34 states that recognize chronic, severe, debilitating, or intractable pain. PTSD, experienced by 32% of all respondents and 52% of veteran respondents, is recognized by at least 27 states.[43]

The inclusion of these conditions is on solid scientific footing. A careful and exhaustive review of evidence relating to cannabis and cannabinoids, carried out by the National Academies of Science, Engineering, and Medicine, found "substantial evidence" that THC, CBD, and cannabinol (CBN), a third major component of cannabis, can help relieve chronic pain.[44] That report also recognized the anti-inflammatory properties of cannabis as key to its therapeutic potential.[45] Some of the most common symptoms of such illnesses as fibromyalgia, rheumatoid arthritis, lupus, glaucoma, IBS, and Crohn's disease, include pain, discomfort, and inflammation, suggesting that cannabis can provide symptomatic relief for these conditions.[46] Cannabis may be more effective than opioids for certain types of pain and several studies have found that chronic pain patients who use cannabis are able to cease or reduce their opioid use, a pattern that we also found among survey respondents.[47] A growing body of research also demonstrates that cannabis can relieve symptoms of PTSD.[48]

To be sure, more research is needed to better understand the precise mechanisms through which cannabis provides relief for various conditions, and what individual-level factors affect cannabis's therapeutic potential. But the crippling nature of many of these complex conditions and the insufficient relief provided by available treatments require accessible alternatives. Lack of health care access and the prohibitive cost of care for individuals with little or no insurance intensify the need for affordable options. This is especially true in Texas, which has the largest uninsured population in the country. A broader, more flexible qualification system that is consistent with current research and other state medical cannabis programs will benefit millions of residents who suffer from chronic, debilitating conditions.

2. *Remove the cap on THC content. Allow doctors and patients to determine the optimal strength and dosage for each individual's medical needs.*

The CUP's current cap on allowable THC content at .5% is not grounded in science and it renders the cannabis available through the program ineffective for many Texans with qualifying conditions. As of February 2021, fewer than 5,000 patients were listed in the Compassionate Use Registry, even though the 2019 expansion of qualifying conditions made over two million state residents eligible.[49] Eighteen percent of survey respondents said they use medical cannabis illicitly to treat neuropathy, despite this diagnosis making them eligible for the state's medical program. Respondents also reported using illicit cannabis for such conditions as multiple sclerosis, autism, and Parkinson's disease, illnesses also covered by the CUP. The low number of program registrants and the continued use of illicit cannabis with higher THC content among qualifying individuals clearly demonstrate that the program is excluding a large contingent of its target population.

Medical cannabis products that isolate CBD and remove THC may provide relief for some patients, but they are also stripped of what Dr. Raphael Machoulam, an Israeli chemist who is considered the "Father of Cannabis Research," calls the plant's "Entourage Effect," in which the components of cannabis work better together than in isolation.[50] Scientific evidence demonstrates the important role THC plays in cannabis's therapeutic effects.[51]

The .5% cap on THC content, which ignores evidence of the chemical's therapeutic importance, is ostensibly intended to prevent anyone consuming medical cannabis products from experiencing the psychoactive effects of THC. Among the many criteria for regulating pharmacological substances, this reasoning is unique. Nearly every approved medication harbors side effects, some of which, such as those associated with prescription opioids, are also psychoactive and potentially much more serious than the side effects associated with cannabis use. Indeed, one of the top reasons among survey respondents for trading opioids and benzodiazepines for cannabis, other than ineffectiveness, was the impairment and dependency that accompany sustained use of these drugs. It is no small irony that some elected officials oppose allowing access to THC for these same reasons.

3. ***Revise the state's current regulatory scheme so that program oversight rests with qualified medical professionals who can adjust program guidelines in response to evolving research and other relevant considerations.***

    Decisions regarding CUP-eligible conditions and proper dosing are medical concerns that should be addressed by medical professionals. Yet, puzzlingly, regulatory authority for the CUP rests with the Texas Department of Public Safety (DPS), an agency whose primary mission is law enforcement. DPS' Public Safety Commission oversees the CUP. The commission typically has five members who are appointed by the governor and confirmed by the state Senate for six-year terms. Of the four members for whom information is available on DPS' website, none has a medical background.[52]

    Texas' decision to put the DPS in charge of CUP implementation and oversight is unusual. Most states have designated departments of health to regulate medical cannabis programs. Some rely on general licensing boards or alcohol control boards for program oversight, while others have divided authority between multiple agencies or have created new cannabis-specific boards.[53]

    There are numerous regulatory structures that would be effective for Texas. For instance, the legislature could split oversight between relevant authorities, such as the Department of State Health Services and the Department of Licensing and Regulation, or it could create a board that specializes in cannabis oversight. Regardless of approach, oversight should involve qualified medical professionals who have authority to adjust the CUP when there are valid reasons to do so, without being dependent on the two-year legislative cycle.

4. *Provide legal protections against discrimination and denial of benefits in areas including but not limited to employment, heath care, housing, education, and parental rights for individuals who use medical cannabis.*

Qualitative responses to this survey revealed that some respondents lost employment due to medical cannabis use. Several reported losing access to prescription opioids for testing positive for cannabis on a drug screen. For medical legalization to be fully realized, patients must be legally protected from reprisal for use in all critical aspects of life, including employment, health care, housing, parental rights, and education.

Roughly 20 states prevent employers from firing or discriminating against employees for off-duty medical cannabis use.[54] More are expected to follow suit by implementing protections for medical cannabis patients, as the ramifications of not doing so are becoming more apparent. Without legal protections, medical cannabis remains off limits to anyone who must provide a negative cannabis drug screen as a condition of obtaining work, health care, and various forms of assistance. This is more likely to impact individuals in employment sectors that routinely drug test and low-income people who seek social assistance. The absence of such protections harms patients and will perpetuate inequities in cannabis policy by making medical access more difficult for some groups than others.

5. *Make possession of small amounts of cannabis flower and concentrates for personal use a fine-only offense.*

Individuals who use cannabis for medical purposes are criminalized under current Texas law. An expansion of the Compassionate Use Program that follows the recommendations laid out above would, in theory, remove the need to decriminalize cannabis possession in order to protect patients from arrest and prosecution. But even a fully legal medical market can exclude individuals who may not have access to dispensaries but still use for medical purposes.

In legal medical states, for example, dispensaries are often located far away from poor neighborhoods and low-income people may not have access to a medical professional who can issue them a cannabis license.[55] These factors increase the likelihood that individuals who experience disadvantages will continue to use cannabis illicitly—even if they have legitimate medical reasons to use and live in a state with medical access—and thus be more vulnerable to law enforcement intervention. Current trends suggest this would be a problem in Texas; nearly six years after the CUP was originally signed into law, DPS has approved only three businesses to grow and sell cannabis in the entire state, creating geographic inequity in access.[56]

Legalizing medicinal cannabis without decriminalizing simple possession can thus exclude marginalized communities from the benefits of reform while maintaining, if not increasing, racial disparities in cannabis arrests.[57] Decriminalization measures also must apply to both cannabis flower and concentrates to reflect changing consumption practices among patients, who may prefer such alternatives as edibles in order to avoid the potentially harmful health effects of smoking.[58]

Conclusion

Findings from this survey provide compelling evidence that Texans are using cannabis for common, chronic, and complex mental and physical conditions, and that it is helping them lead more enjoyable and productive lives. Cannabis has increased the effectiveness of prescribed medications for some patients and it has helped many others cease or reduce the use of prescriptions that have unpleasant and sometimes dangerous side effects. The few negative impacts reported, primarily involving legal and employment difficulties, stem from prohibition. Cannabis's illegal status also negatively impacts patients' communications with health care providers, and it forces residents to turn to the illicit market or other states for cannabis, the result of which is risk and inconvenience for patients and a missed economic opportunity for Texas.

The findings presented here are based on self-reports from a nonrandom sample of medical cannabis users in Texas. They are not generalizable to the broader population, nor do they provide an external measure of cannabis's impact on users' health. Still, this survey improves our understanding of the motivations and experiences of medical cannabis users in Texas and provides insight into opportunities for improvement to the state's Compassionate Use Program. Survey findings are also consistent with the growing body of evidence supporting cannabis's role as an effective treatment for a variety of conditions, one whose side effects may be preferable to those of many commonly prescribed medications.

Further research is needed using validated, external metrics of the physiological and psychological effects of cannabis use, including examination of the relationships between dosage levels, routes of administration, and interactions with various conditions and other medications. This critical endeavor will be significantly advanced if and when the federal government loosens restrictions on cannabis research. Findings from this survey also indicate that future research should focus on medical cannabis use among minorities, the role that health care access plays in individuals' decisions to use cannabis, and the ways in which cannabis use may affect patients' relationships with their health care providers.

Those who support expanding access to medical cannabis, including us, do not claim that it is a panacea. We take seriously the plant's complexities and its power to alter one's physical and mental state. But we are also persuaded by the research demonstrating cannabis's therapeutic value. Thirty-six states, the majority of the U.S. population, and the majority of Texans also agree that the benefits of medical legalization outweigh any potential downsides.[59] State lawmakers have fallen behind the science and public opinion, but it is not too late to reverse course and make Texas a model for an evidence-based, accessible, equitable, and profitable medical cannabis program.

Endnotes

[1] Trish Long, "1915: El Paso becomes first city in United States to outlaw marijuana," *El Paso Times*, November 16, 2019, https://eu.elpasotimes.com/story/news/2019/11/14/el-paso-history-pot-possession-first-city-outlaw-weed-tbt/2579079001/

[2] Katharine Neill, "Tough on Drugs: Law and Order Dominance and the Neglect of Public Health in U.S. Drug Policy," *World Medical and Health Policy* 6, no. 4 (2014): 375.

[3] National Conference of State Legislatures (NCSL), *State Medical Marijuana Laws,* 2020, https://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx

[4] However, local law enforcement seems slow to make use of the cite and release option; in the last three months of 2020 the El Paso police department admitted just 22% of eligible people to the program. See Aaron Montes, "El Paso 'cite and release' program affecting teens and young adults," *KTSM*, January 25, 2021, https://bit.ly/3dzEjo0.

[5] In 2019, Texas legalized hemp products, which are now available over the counter and contain up to .3% THC.

[6] See John Schwartz, "Lee Otis, Free," *Texas Monthly*, August 2020, https://bit.ly/3siVOxU

[7] Compassionate Use Program, (n.d.). retrieved December 17, 2020, from https://www.dps.texas.gov/rsd/cup/index.htm.

[8] For comparison of state programs, see NCSL, note 3

[9] Viridiana Edwards, "The Battle Off the Battlefield: Exploring Medical Cannabis Use Among U.S. Veterans Looking for Relief, " (University of Texas at El Paso, 2019), Open Access Theses & Dissertations. https://digitalcommons.utep.edu/open_etd/1980.

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[11] J. Harrington, "There are 18.2 million veterans in the U.S. Which state is home to the most of them?" *USA Today*, July 4, 2019, https://bit.ly/3smu5f3.

[12] Department of Veterans Affairs, *Texas Veteran Suicide Data Sheet, 2018*, https://bit.ly/3nROPIR. Nationally, veterans commit suicide at a rate of 32 per 100,000 people compared to a rate of 18.4 per 100,000 among the general population.

[13] Washington State University, "Cannabis temporarily relieves PTSD symptoms, study suggests," *ScienceDaily*, June 9, 2020. Retrieved December 17, 2020 from https://bit.ly/3c7Bf1D; also see S. Paulsen, "Texas' New Medical Marijuana Law Doesn't Cover Veterans Suffering from PTSD, *Texas Observer*, July 10, 2019, https://bit.ly/3ojhsyK.

[14] A total of 3,360 responses were received from residents in 441 cities and towns in Texas. Forty respondents were medical cannabis "refugees," individuals who have left Texas due to lack of cannabis access, and 11 respondents replied to the Spanish language version of the survey. These responses will be the focus of future analysis. An additional 446 responses were removed for not listing a current or former city of residence in Texas.

[15] See for example, American Civil Liberties Union, *A Tale of Two Countries: Racially Targeted Arrests in the Era of Marijuana Reform*, 2020.

[16] See Texas NORML, Texas Marijuana Policy Legislator Voting Records, https://bit.ly/380dlCt.

[17] Chronic pain can be difficult to diagnose because while it presents a clear symptom, the disease or physiological process causing the pain is unknown, or there may be disagreement among medical professionals about the existence of certain causes of pain. See Institute of Medicine Committee on Pain, *Pain and disability: Clinical, behavioral, and public policy perspectives* (Washington, D.C.: National Academies Press), 1987, https://bit.ly/39PbkJ9.

[18] William Martin, "War without end," *Texas Monthly*, June 14, 2014, https://bit.ly/35WKuh2.

[19] Various forms of neuropathy are included in the state's definition of "incurable neurodegenerative diseases." See Texas Administrative Code, https://bit.ly/3bEA1dX.

[20] For other states' qualifying conditions see Marijuana Policy Project, "Key aspects of state and D.C. medical marijuana laws," 2020, https://bit.ly/3bZb0ua.

[21] The National Academies of Sciences, *The Health Effects of Cannabis and Cannabinoids*, 2017, https://bit.ly/3ds6X8s; Jairo Vinicius Pinto, et al., "The prevalence and clinical correlates of cannabis use and cannabis use disorder among patients with bipolar disorder: A systematic review," *Neuroscience & Behavioral Reviews* 101 (2019): 78-84, https://bit.ly/2Mg3DUt.

[22] James Dahlhamer, et al., 2018, *Prevalence of chronic pain and high-impact chronic pain among adults—United States, 2016,* Centers for Disease Control and Prevention, https://bit.ly/3bUffHv.

[23] Anxiety and Depression Association of America, Facts & Statistics, 2020, https://bit.ly/2M6Hx6E .

[24] Substance Abuse and Mental Health Services Administration, 2019 NSDUH Detailed Tables, https://bit.ly/3sIOVpG.

[25] Ibid.

[26] Sophie Ravn and Tonny Anderson, 2020, "Exploring the relationship between posttraumatic stress and chronic pain," *Psychiatric Times*, https://bit.ly/3sX3BSf ; J. Sheng, et al., 2017, "The link between depression and chronic pain," *Neural Plasticity (*2017*)*, https://bit.ly/3nRBSzM.

[27] Roughly 9.5 million adults had co-occurring mental health issues and SUDs in 2019. See NSDUH, https://bit.ly/2NnGdNr. One out of three veterans that have been diagnosed with a SUD have also been diagnosed with PTSD. Veterans Affairs, https://bit.ly/39UauLv.

[28] For example, see K.M. Takakuwa, et al., "The Impact of Medical Cannabis on Intermittent and Chronic Opioid Users with Back Pain: How Cannabis Diminished Prescription Opioid Usage," *Cannabis and Cannabinoid Research*, 2020, https://bit.ly/3q5rncg.

[29] Drugs were coded according to their official drug classification. We note that some drugs may be prescribed "off label" or for conditions adjacent to their drug classification. Trazodone, for example, is an antidepressant that also functions as a sedative and is commonly prescribed for anxiety and insomnia.

[30] Though physical dependence may be one symptom of addiction, these are distinct issues. See National Institute on Drug Abuse, *Principles of Drug Addiction Treatment*, 2018, https://bit.ly/3qki0Wn.

[31] See Pew Charitable Trusts,"Opioid overdose crisis compounded by polysubstance use," October 8, 2020, https://bit.ly/2XBVjRc.

[32] Centers for Disease Control and Prevention, "Opioid overdose: Other drugs," 2021, https://bit.ly/3t1tbVY.

[33] Spencer Grubbs and Bruce Wright, Uninsured Texans, *Fiscal Notes*, Texas Comptroller, 2020, https://bit.ly/3t6IbST .

[34] It is not entirely clear why veterans reported disclosing cannabis use more frequently, but it could be indicative of their military training, which is intended to instill commitment to certain core values, such as integrity, among all service members. *Department of Defense Core Values* (Arlington: Military Leadership Diversity Commission, 2009).

[35] A. Strauss and J. Corbin, "Grounded Theory Research: Procedures, Canons, and

Evaluative Criteria," *Qualitative Sociology* 13, no. 1 (1990).

[36] Hierarchical coding was used to analyze data at different levels of detail. For example, within the theme of "improved relationships" subthemes of "improved as a parent," "improved social relationships," and "improved romantic relationships" were identified.

[37] In 2019 New Mexico announced that it would allow out-of-state residents to participate in their medical cannabis program for three years. In 2020 this action was quickly overturned, but state health officials still accepted medical cannabis cards from other states as part of their reciprocity program. See https://bit.ly/3oiLu6u and https://bit.ly/38jEhxz.

[38] Vicente Sederberg LLP, *Medical cannabis in Texas*, Foundation for an Informed Texas, December 2020, https://bit.ly/38xDIA3.

[39] Ibid.

[40] Direct communication with the former manager of the dispensary on November 2, 2020 through Facebook Messenger. Due to the sensitive nature of the topic, we have chosen to keep the identity of the dispensary and the individual we spoke with private.

[41] K. Jaeger, "Colorado Governor Tells Texas Not to Legalize Marijuana So His Own State Can Get More Tourists," October 22, 2020, retrieved December 1, 2020, from https://www.marijuanamoment.net/colorado-governor-tells-texas-not-to-legalize-marijuana-so-his-own-state-can-get-more-tourists/.

[42] Sami Sparber and Aria Jones, "Texas' medical marijuana program is one of the most restrictive in the country," *Texas Tribune*, January 4, 2021, https://bit.ly/38xjt5J. Also see Elena Mejia Lutz, "'Not bad enough': The families left behind by Texas' medical marijuana program," *Texas Observer*, December 19, 2017, https://bit.ly/35IJo8D

[43] Marijuana Policy Project, see note 21.

[44] The National Academies of Sciences,, Engineering, and Medicine, *The Health Effects of Cannabis and Cannabinoids*, 2017, https://bit.ly/3ds6X8s. Also see S. Murray, et al., "The effect of medicinal cannabis on quality of life in the management of non-cancer chronic pain," *Value in Health*, 2020, https://bit.ly/2Yb0qbv.

[45] Ibid.

[46] See M. Guillouard, "Cannabis use assessment and its impact on pain in rheumatologic diseases," *Rheumatology*, 2020, https://bit.ly/3qQRhRI; Iftach Sagy, et al.,"Safety and efficacy of medical cannabis in fibromyalgia," *Journal of Clinical Medicine*, 2019, https://bit.ly/39fXEI1; Arun Swaminath, et al., "The role of cannabis in the management of inflammatory bowel disease", *Inflammatory Bowel Diseases*, 2019, https://bit.ly/3odN0pL.

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[48] Alfonso Abizaid, et al., "Cannabis: A potential efficacious intervention for PTSD or simply snake oil?" 2019, *Journal of Psychiatry & Neurosciences*, https://bit.ly/2H1Djeo; Laura Orsolini, et al., "Use of medicinal cannabis and synthetic cannabinoids in PTSD: A systematic review," *Medicina*, 2019, https://bit.ly/31bhkIZ ; Donald I. Abrams, "The therapeutic effects of Cannabis and cannabinoids: An update from the National Academies of Sciences, Engineering, and Medicine report*, European Journal of Internal Medicine*, 2018, https://bit.ly/3qS4eKO; Tomer Mizrachi Zer-Aviv, "Cannabinoids and PTSD: Clinical and preclinical evidence for treatment and prevention," *Behavioral Pharmacology*, 2016, https://bit.ly/2T4u3s9.

[49] See note 43, Sparber and Jones, "Texas' medical marijuana program" for eligible patient estimate; see Texas DPS, CUP Patient Counts, 2020, https://bit.ly/3nU3RPl for number of registered patients.

[50] See note 19, Martin and Neill Harris, "Marijuana as Medicine," 2019; Ethan Russo, "Taming THC," *BJP*, 2011, https://bit.ly/2SUIoYp.

[51] National Academies of Sciences, "Therapeutic effects of cannabis."

[52] Texas DPS, Public Safety Commission, https://bit.ly/39ah7cL

[53] Marijuana Policy Project, 2020, Regulatory Authorities and Medical Cannabis, https://bit.ly/2H2mU9z

[54] Sachi Barreiro, State laws on off-duty marijuana use, https://bit.ly/2Ynnfsh.

[55] See Alexander Lekhtman, "Why Are Black Arrest Rates for Marijuana Rising in Los Angeles?" *Filter Magazine*, July 16, 2020, https://bit.ly/3cCMkWO.

[56] See note 43, Sparber and Jones. As of March 2021, the Texas DPS is currently not accepting new applications for dispensing organization licenses, see https://bit.ly/39ucJF6. For information on licensing process, see Andrea Steel, "How to get a medical marijuana dispensary license in Texas," 2019, https://bit.ly/3soGbVB.

[57] Arkansas, Florida, Georgia, Louisiana, Oklahoma, Pennsylvania, Utah, and West Virginia currently allow medical use but prohibit simple possession. In several of these states, both arrests and racial disparities have increased post-reform. American Civil Liberties Union, *A Tale of Two Countries: Racially Targeted Arrests in the Era of Marijuana Reform*, 2020.

[58] See Fiona Murphy, et al., "Baby boomers and cannabis delivery systems," *Journal of Drug Issues* 45, no. 3 (2015): 293-313, https://bit.ly/3slP6WK. While possession of two ounces or

less of marijuana flower is a misdemeanor under Texas law, possession of less than one gram of concentrates is a state jail felony.

[59] A 2020 Emerson College poll found that 61% of Texans want marijuana legalized for medical purposes, https://bit.ly/3iqeNls. Nationally, a 2019 Quinnipiac poll found that 93% of voters support access to medical marijuana, https://bit.ly/3sAMt4l.