Pacific Southwest (HHS Region 9)
PTTC Prevention Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

Considering the Associations Between Substance Use and Suicide

September 7, 2023

Dr. Jason Kilmer, Ph.D.

1

Disclaimer

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2

PTTC Prevention Technology Transfer Center Network
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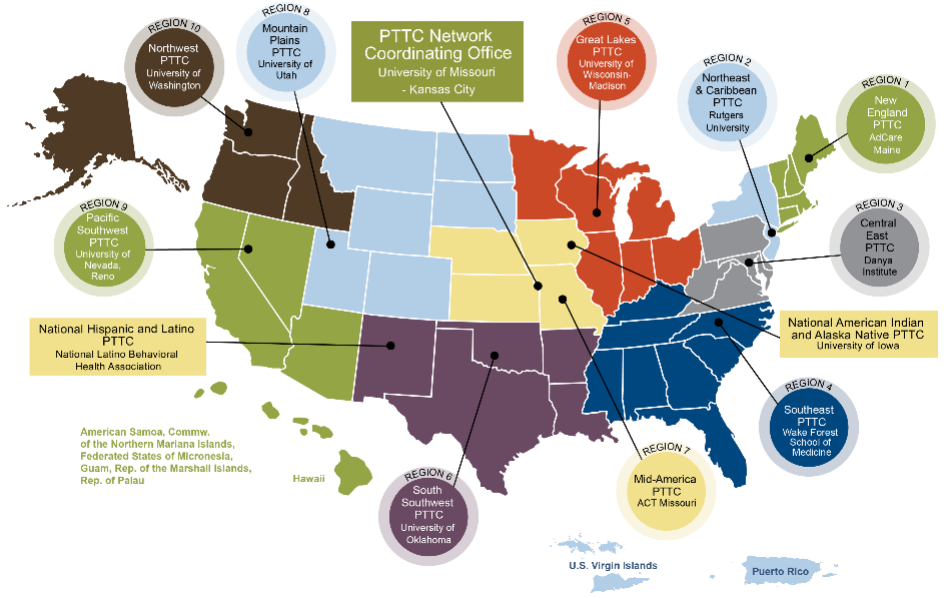
PTTC Network



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Purpose of the TTCs

1. Develop and strengthen the **workforces** that provide substance use disorder and mental health disorder prevention, treatment, and recovery support services.

2. Help people and organizations incorporate **effective practices** into substance use and mental health disorder prevention, treatment and recovery services.

4

PTTC Network Approach

The PTTCs…
Develop and disseminate tools and strategies needed to improve the quality of substance abuse prevention efforts
Provide training and resources to prevention professionals to improve their understanding of • prevention science, • how to use epidemiological data to guide prevention planning, and • selection and implementation of evidence-based and promising prevention practices.
Develop tools and resources to engage the next generation of prevention professionals

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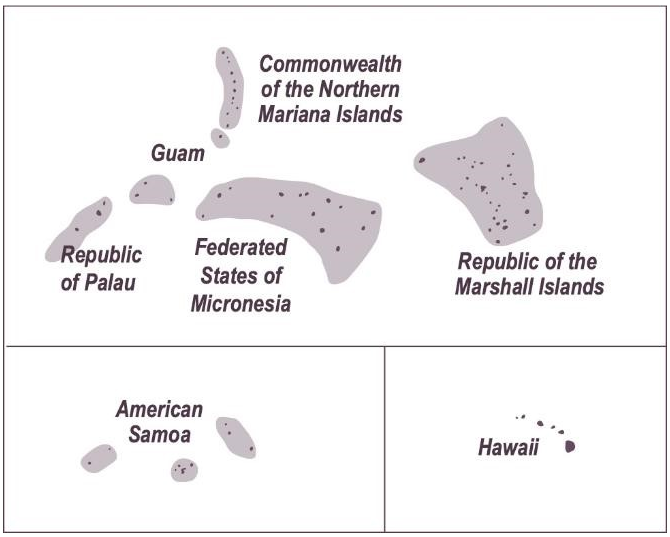
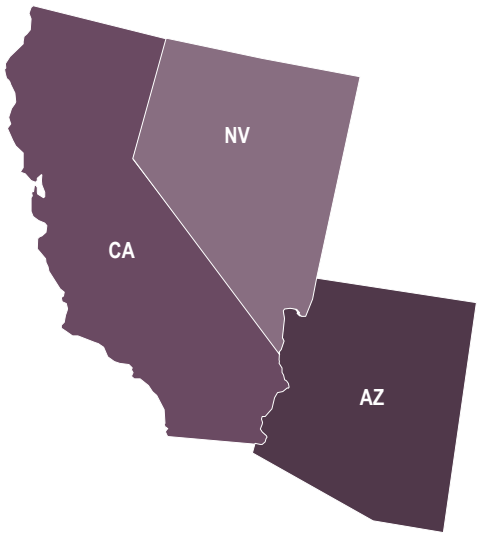
Pacific Southwest

CASAT
Center for the Application of Substance Abuse Technologies
UNIVERSITY OF NEVADA, RENO





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Land acknowledgement

We acknowledge that the University of Nevada, Reno is situated on the traditional homelands of the Numu (Northern Paiute), Wašiw (Washoe), Newe (Western Shoshone), Nuwu (Southern Paiute) peoples. These lands continue to be a gathering place for Indigenous Peoples and we recognize their deep connections to these places. We extend our appreciation for the opportunity to live and learn on their territory.

7

Housekeeping

- For technical support email Karen at ktotten@casat.org
- Webinar recording and materials
- Certificates of attendance

8

Today's Presenter

Dr. Jason Kilmer, Ph.D., is an Associate Professor in Psychiatry and Behavioral Sciences at the University of Washington (UW) School of Medicine and an Adjunct Associate Professor in Psychology at UW. Jason serves as an investigator on several studies evaluating prevention and intervention efforts for alcohol, cannabis, and other drug use by college students. In addition to research and teaching, he has worked extensively with college students and student groups around alcohol and other drug prevention programming and presentations throughout his career (including student athletes, fraternity and sorority members, residence life, and first-year students), both at UW and on over 125 campuses across the nation.

As faculty in the School of Medicine, Jason continues his direct work with students through presentations for intercollegiate athletics and residence life. Jason also serves as the chairperson of Washington state's College Coalition on Substance misuse, Advocacy, and Prevention (CCSAP).

9

Considering Associations Between Substance Use and Suicide

Jason R. Kilmer, Ph.D.
University of Washington
Associate Professor
Psychiatry & Behavioral Sciences
Adjunct Associate Professor
Psychology

10

Overview of this presentation

- Special thank you to Britany Wiele, Alyssa O'Hair, Karen Totten, CASAT, and the Pacific Southwest PTTC
- Thank you to all of you for doing what you do to support people in your community
- Objectives:
  - 1. Participants will be able to describe "alcohol myopia" and how this relates to suicide risk.
  - 2. Participants will be able to identify a screening measure for cannabis use disorder
  - 3. Participants will be able to describe at least one potential unwanted outcome associated with the use of high potency cannabis
  - 4. Discuss at least one implication for prevention, intervention and public health.

11

Research that considers links between substance misuse and suicide risk

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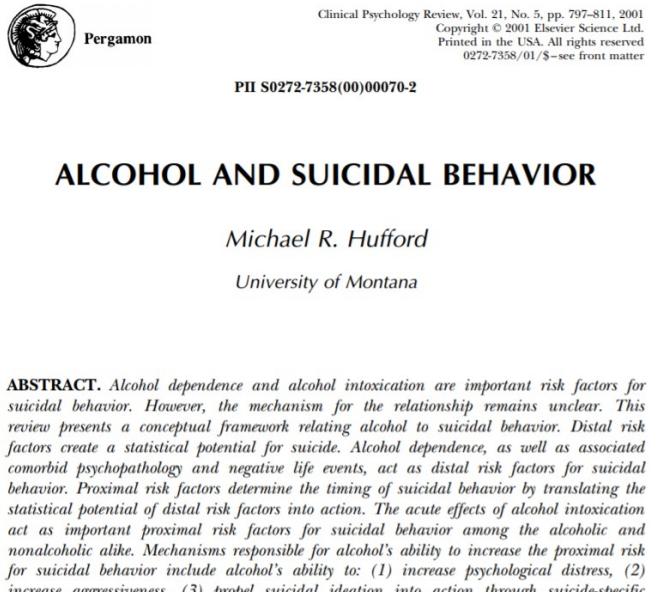
Hufford, M.R. (2001). Alcohol and suicidal behavior. *Clinical Psychology Review, 21* (5), 797-811.



Pergamon

Clinical Psychology Review, Vol. 21, No. 5, pp. 797–811, 2001

0272-7358/01/$–see front matter

PII S0272-7358(00)00070-2

ALCOHOL AND SUICIDAL BEHAVIOR

Michael R. Hufford

University of Montana

ABSTRACT. *Alcohol dependence and alcohol intoxication are important risk factors for suicidal behavior. However, the mechanism for the relationship remains unclear. This review presents a conceptual framework relating alcohol to suicidal behavior. Distal risk factors create a statistical potential for suicide. Alcohol dependence, as well as associated comorbid psychopathology and negative life events, act as distal risk factors for suicidal behavior. Proximal risk factors determine the timing of suicidal behavior by translating the statistical potential of distal risk factors into action. The acute effects of alcohol intoxication act as important proximal risk factors for suicidal behavior among the alcoholic and nonalcoholic alike. Mechanisms responsible for alcohol's ability to increase the proximal risk for suicidal behavior include alcohol's ability to: (1) increase psychological distress, (2) increase aggressiveness, (3) trobel suicidal ideation into action through suicide-specific*

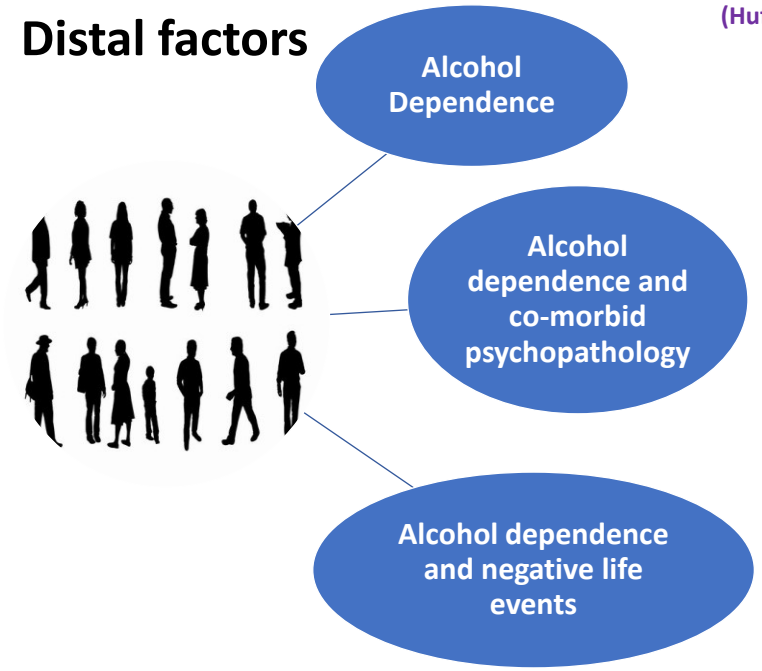
13

Alcohol-related risk factors for suicide (Hufford, 2001)

- **Distal risk factors**
  - Relatively stable characteristics/ events occurring in the weeks, months, or years preceding suicidal behavior.
- **Proximal risk factors**
  - Variables that increase suicide risk in moments immediately before suicidal behavior

14

Alcohol-related risk factors for suicide
(Hufford, 2001)



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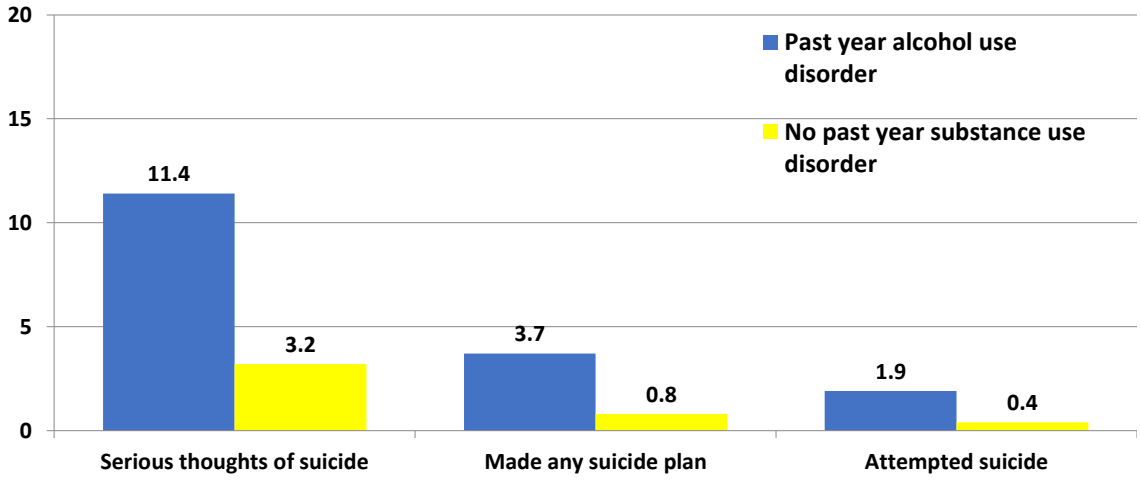
Percentage endorsing item as a function of having a past year alcohol use disorder or no past year substance use disorder



Source: SAMHSA (2023)
https://www.samhsa.gov/data/report/2021-nsduh-detailed-tables
Table 6.79 B (page 1,156 of 1,818)

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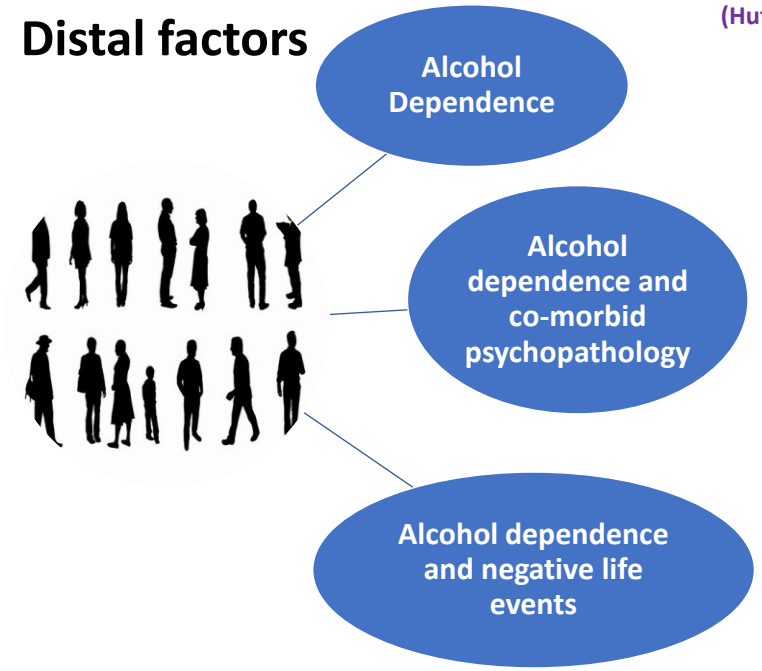
Alcohol-related risk factors for suicide
(Hufford, 2001)



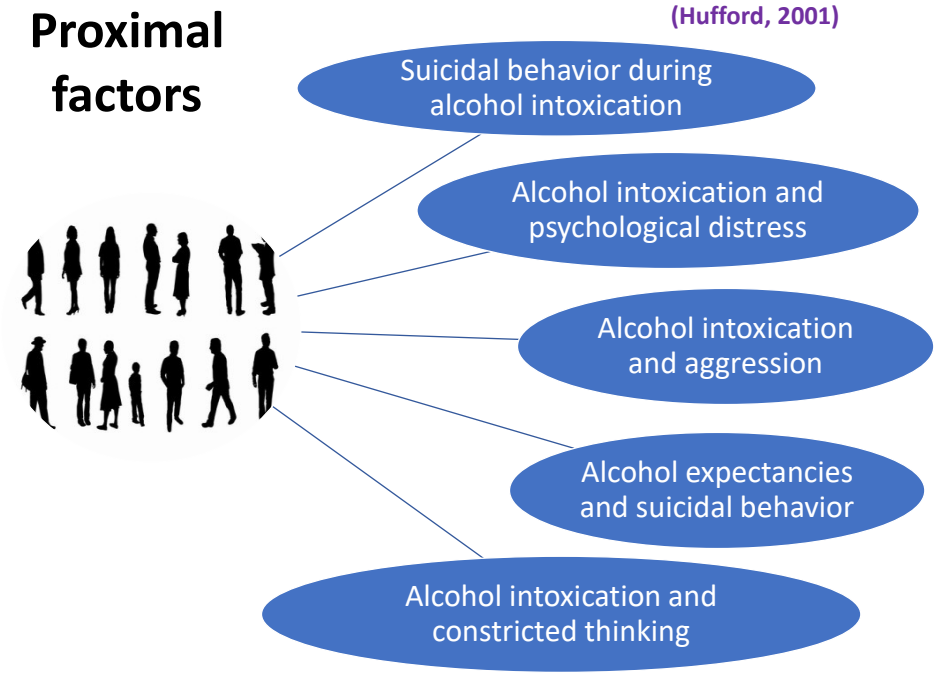
17

Alcohol-related risk factors for suicide (Hufford, 2001)

- **Distal risk factors**
  - **Alcohol dependence and negative life events**
    - **Interpersonal loss**
      - **Over one-fourth of those with alcohol dependence who died by suicide experienced interpersonal loss within 6 weeks of their death (Murphy, et al., 1979)**
    - **Relapse**
      - **Those with alcohol dependence are at greater risk for suicide during periods of active drinking**

18

Alcohol-related risk factors for suicide
(Hufford, 2001)



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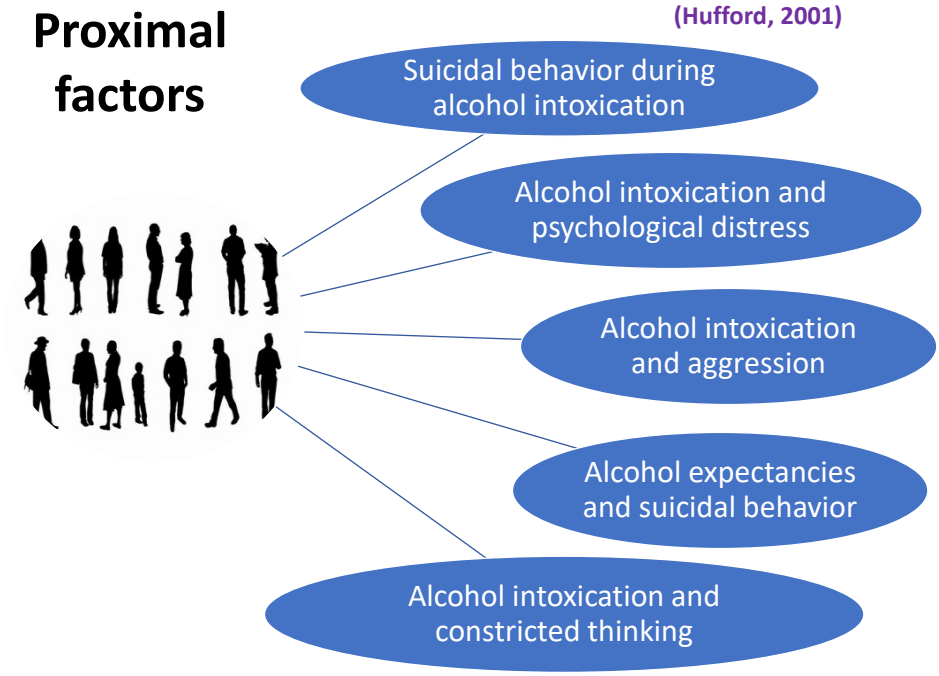
Alcohol-related risk factors for suicide (Hufford, 2001)

- **Proximal risk factors**
  - **Suicidal behavior during alcohol intoxication**
    - **Looking at odds ratios, Borges & Rosovsky (1996) showed consumption of over 10 standard drinks increases risk for suicide attempts *90 times* in comparison to abstinence**
    - **Acute intoxication greater risk than habitual**

20

Alcohol-related risk factors for suicide
(Hufford, 2001)



21

Alcohol-related risk factors for suicide (Hufford, 2001)

- **Proximal risk factors**
  - **Alcohol intoxication and constricted thinking**
    - **Alcohol myopia** (Steele & Josephs, 1990)

22

Steele, C.M., & Josephs, R.A. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist, 45* (8), 921-933.

Alcohol Myopia

Its Prized and Dangerous Effects

Claude M. Steele and Robert A. Josephs *University of Michigan*

ABSTRACT: This article explains how alcohol makes social responses more extreme, enhances important self-evaluations, and relieves anxiety and depression, effects that underlie both the social destructiveness of alcohol and the reinforcing effects that make it an addictive substance. The theories are based on alcohol's impairment of perception and thought—the myopia *it causes—rather than on the ability of alcohol's pharmacology to directly cause specific reactions or on expectations associated with alcohol's use. Three conclusions are offered (a) Alcohol makes social behaviors more extreme by blocking a form of response conflict. (b) The same process can inflate self-evaluations. (c) Alcohol myopia, in combination with dis-*

icant effects, a straightforward idea has dominated the thinking of laymen and scientists alike: Such effects stem directly from the pharmacological properties of alcohol, much the way relaxation stems from the pharmacological properties of valium. We know, for example, that people often drink alcohol to get the effects they assume it will directly cause: relaxation, a better mood, courage, social ease, and so on (e.g., Goldman, Brown, & Christiansen, 1987; Leigh, 1989; Maisto, Connors, & Sachs, 1981). This idea explains both heads of the beast; some of these direct effects, such as aggression and hostility, can be socially destructive, and others, such as relaxation and tension reduction, are reinforcing enough to make alcohol a po-

23

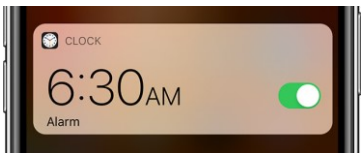
"Alcohol Myopia"

Impelling Cues

Alcohol impairs information processing, **narrowing attention** to only the most salient internal and environmental cues.

?

Inhibiting Cues



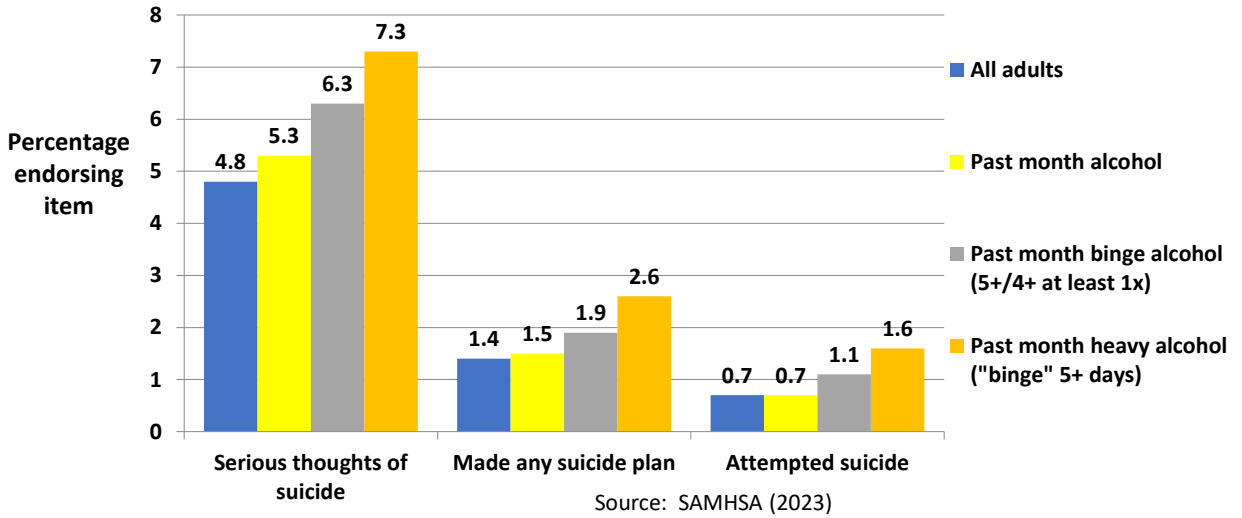
24

Alcohol-related risk factors for suicide (Hufford, 2001)

- **Proximal risk factors**
  - **Alcohol intoxication and constricted thinking**
    - **Alcohol myopia** (Steele & Josephs, 1990)
      - *"The immediate, and usually painful, aspects of experience take on disproportionate weight in the delicate balance between choosing life over death among those contemplating suicide (p. 804)."*
    - **Can interfere with inhibition conflict**
      - *"Alcohol intoxication acts to interrupt inhibition conflict through alcohol myopia, leading to more excessive responses than would have occurred while sober (p. 804)."*

25

Past month alcohol use and relation to suicide among adults over 18 years of age



Source: SAMHSA (2023)
https://www.samhsa.gov/data/report/2021-nsduh-detailed-tables
Table 6.78 B (page 1,154 of 1,818)

26

"Alcohol prevention is suicide prevention…"

Laurie Davidson, Suicide Prevention Resource Center

27

Cannabis Use Associated with Risk of Psychiatric Disorders (Hall & Degenhardt, 2009; Hall, 2009; Hall 2013)

- **Schizophrenia**
  - **Those who had used cannabis 10+ times by age 18 were 2-3 times more likely to be diagnosed with schizophrenia**
  - **"13% of schizophrenia cases could be averted if cannabis use was prevented (Hall & Degenhardt, 2009, p. 1388)"**
- **Depression and suicide**
  - **"Requires attention in cannabis dependent" (Hall, 2013)**

28

Screening

- **Screening suggestions**
  - **Cannabis Use Disorder Identification Test-Revised (CUDIT-R)**
  - **http://www.warecoveryhelpline.org/wp-content/uploads/2018/04/CUDIT.pdf**

The Cannabis Use Disorder Identification Test - Revised (CUDIT-R)

Have you used any cannabis over the past six months? Yes_____ No _____

If you answered "Yes" to the previous question, please answer the following questions about your cannabis use. Circle the response that is most correct for you in relation to your cannabis use over the *past six months.*

1. How often do you use cannabis?

Never	Monthly or less	2-4 times a month	2-3 times a week	4+ times a week
0	1	2	3	4

2. How many hours were you "stoned" on a typical day when you had been using cannabis?

Less than 1	1 or 2	3 or 4	5 or 6	7 or more
0	1	2	3	4

3. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?

Never	Less than monthly	Monthly	Weekly	Daily/almost daily
0	1	2	3	4

4. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
0	1	2	3	4

29

5. How often in the past 6 months have you devoted a great deal of your time to getting, using, or recovering from cannabis?

Never	Less than monthly	Monthly	Weekly	Daily/almost daily
0	1	2	3	4

6. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
0	1	2	3	4

7. How often do you use cannabis in situations that could be physically hazardous, such as driving, operating machinery, or caring for children?

Never	Less than monthly	Monthly	Weekly	Daily/almost daily
0	1	2	3	4

8. Have you ever thought about cutting down, or stopping, your use of cannabis?

Never	Yes, but not in the past 6 months	Yes, during the past 6 months
0	2	4

This questionnaire was designed for self-administration and is scored by adding each of the 8 items:

Question 1-7 are scored on a 0-4 scale
Question 8 is scored 0,2, or 4

Score: _____

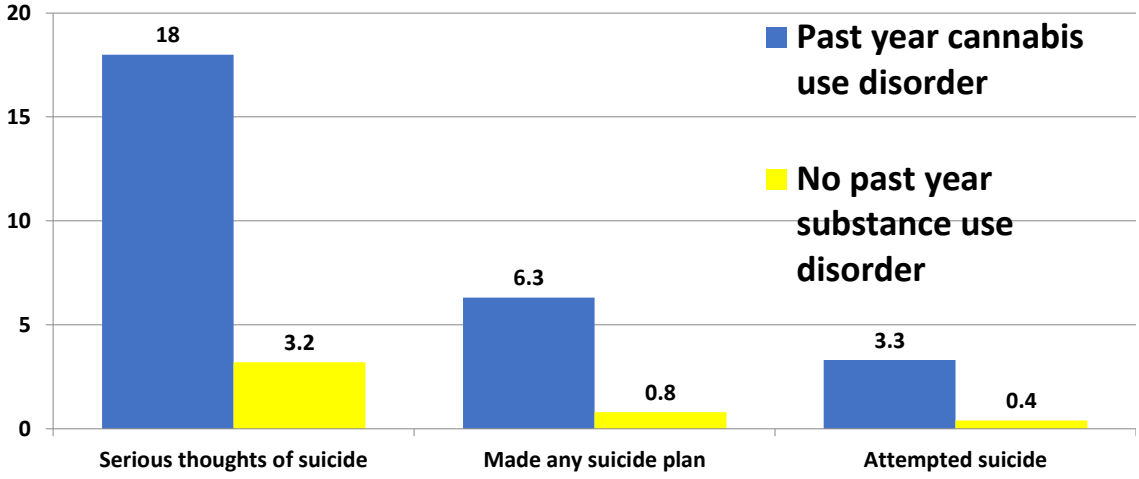
Scores of 8 or more indicate hazardous cannabis use, while scores of 12 or more indicate a possible cannabis use disorder for which further intervention may be required.

Adamson SJ, Kay-Lambkin FJ, Baker AL, Lewin TJ, Thornton L, Kelly BJ, and Sellman JD. (2010). An Improved Brief Measure of Cannabis Misuse: The Cannabis Use Disorders Identification Test – Revised (CUDIT-R). *Drug and Alcohol Dependence* 110:137-143.

Source: Washington Recovery Helpline

30

Percentage endorsing item as a function of having a past year cannabis use disorder or no past year substance use disorder



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31

Percentage endorsing item as a function of having a past year cannabis use disorder, past year alcohol use disorder, or no past year substance use disorder

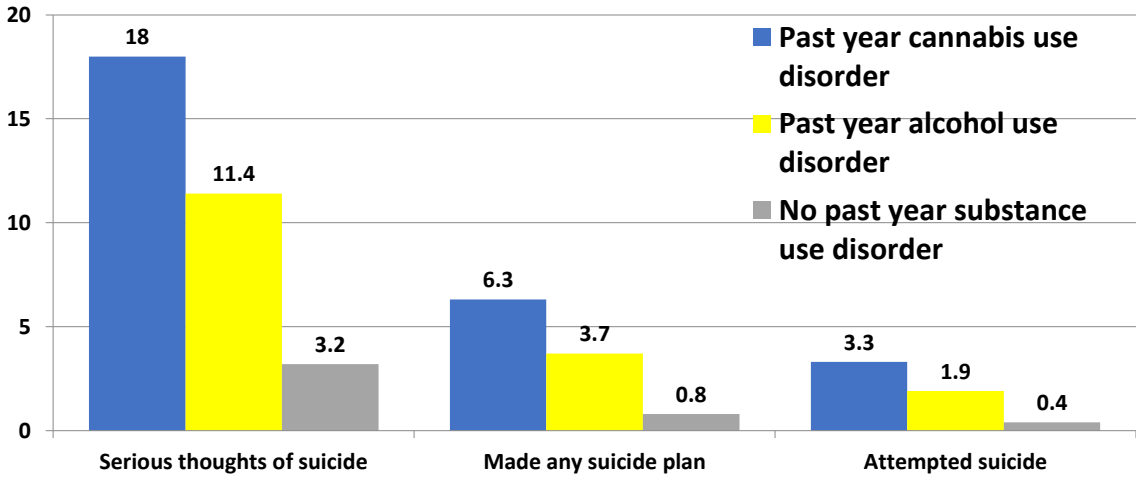

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Table 6.79 B (page 1,156 of 1,818)

32

Considering motives for use that could exacerbate (or cause) unwanted symptoms

33

The relationship of substance use to sleep quality (and subsequent unwanted outcomes)

34

Sleep, Sleepiness, and Alcohol Use

TIMOTHY ROEHRS, PH.D., AND THOMAS ROTH, PH.D.

The study of alcohol's effects on sleep dates back to the late 1930s. Since then, an extensive literature has described alcohol's effects on the sleep of healthy, nonalcoholic people. For example, studies found that in nonalcoholics who occasionally use alcohol, both high and low doses of alcohol initially improve sleep, although high alcohol doses can result in sleep disturbances during the second half of the nocturnal sleep period. Furthermore, people can rapidly develop tolerance to the sedative effects of alcohol. Researchers have investigated the interactive effects of alcohol with other determinants of daytime sleepiness. Such studies indicate that alcohol interacts with sleep deprivation and sleep restriction to exacerbate daytime sleepiness and alcohol-induced performance impairments. Alcohol's effects on other physiological functions during sleep have yet to be documented thoroughly and unequivocally.

KEY WORDS: sleep disorder; physiological AODE (effects of alcohol or other drug use, abuse, and dependence); REM (rapid eye movement) sleep; NREM (nonrapid eye movement) sleep; circadian rhythm; melatonin; prolactin; body temperature; attention; time of day; insomnia;

http://pubs.niaaa.nih.gov/publications/arh25-2/101-109.pdf

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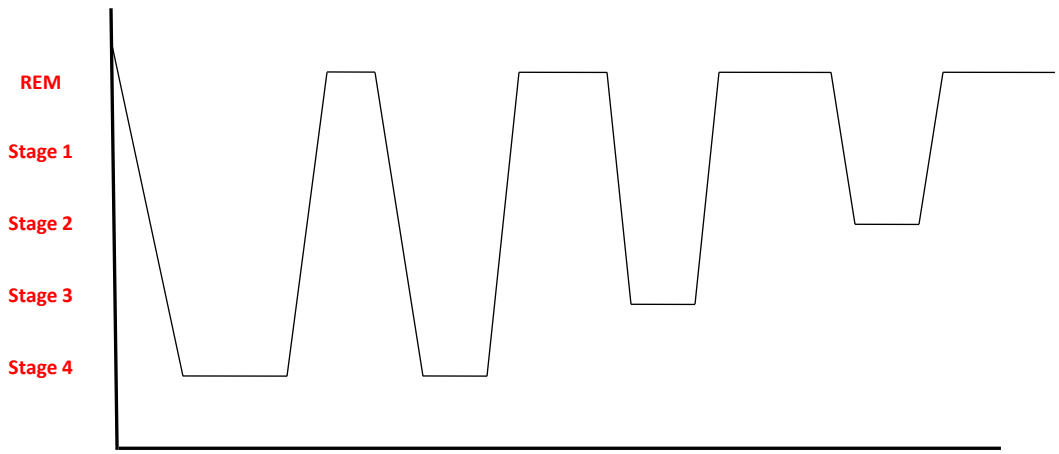

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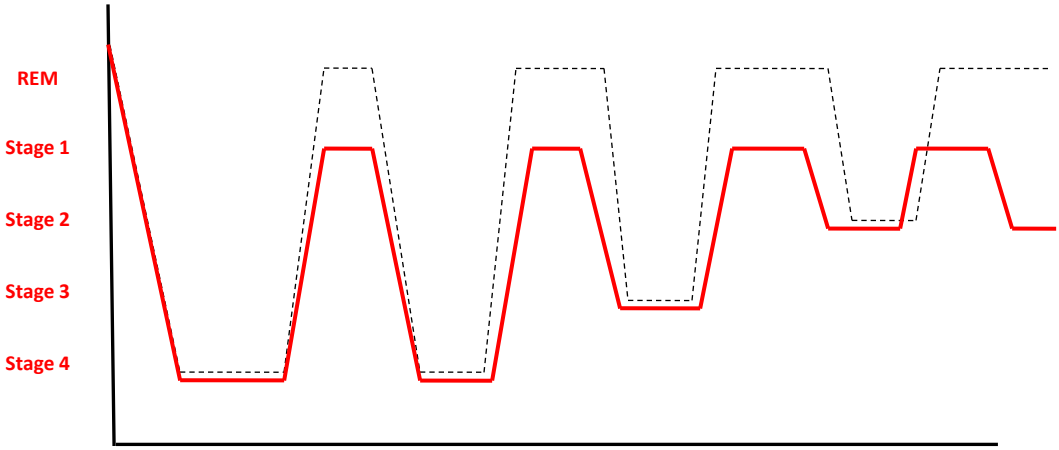

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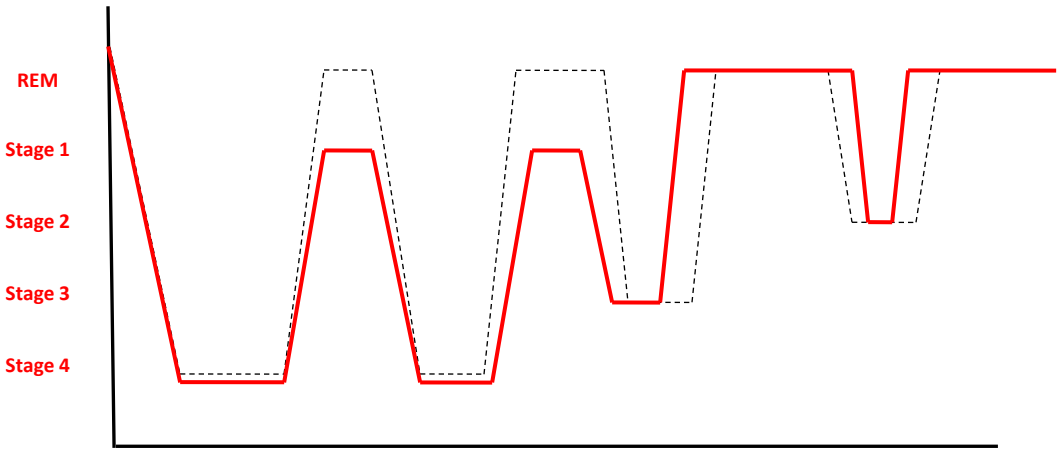

Next day, increase in:
- **Daytime sleepiness**
- **Anxiety**
- **Irritability**
- **Jumpiness**

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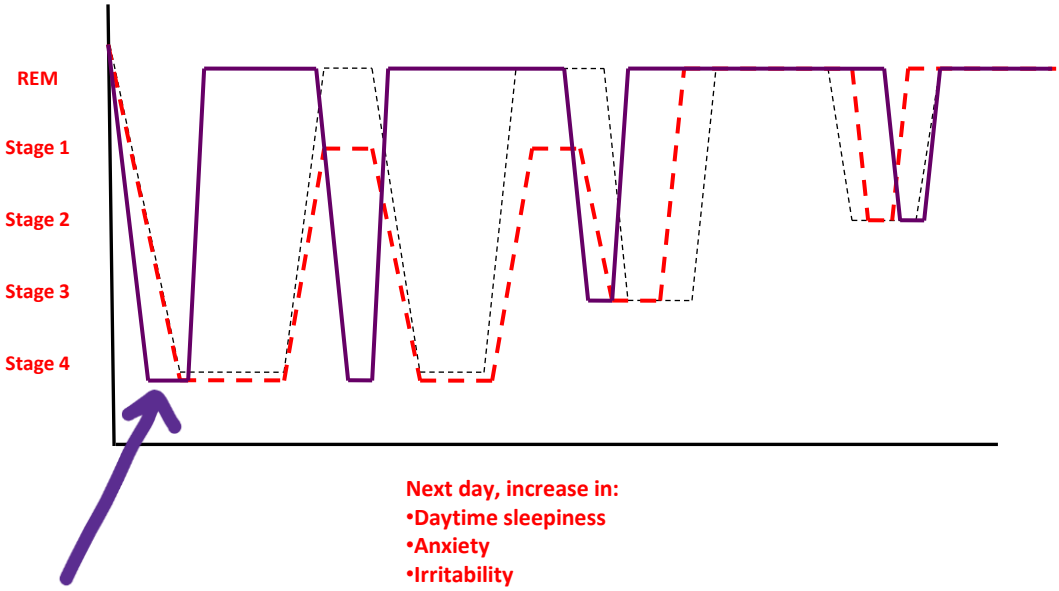

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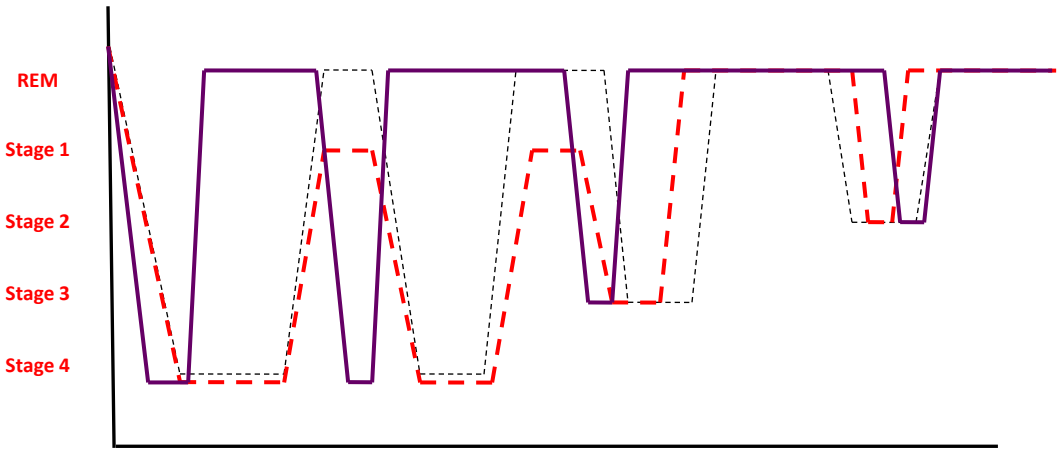
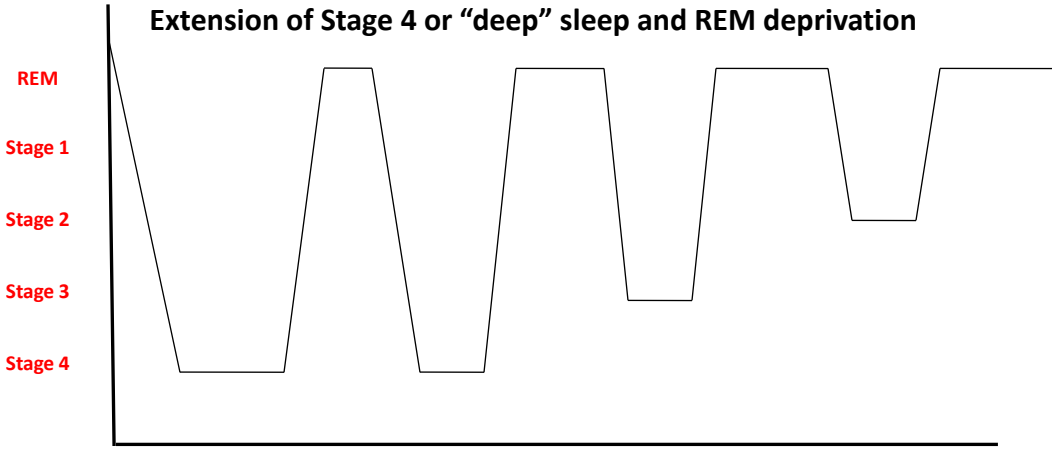


Next day, increase in:
- **Daytime sleepiness**
- **Anxiety**
- **Irritability**
- **Jumpiness**

Next day, feel:
- **Fatigue**

40

With cannabis, two things happen…
Extension of Stage 4 or "deep" sleep and REM deprivation



Angarita, G.A., Emadi, N., Hodges, S., & Morgan, P.T. (2016). Sleep abnormalities associated with alcohol, cannabis, cocaine, and opiate use: A comprehensive review. *Addiction Science & Clinical Practice, 11:* 9.

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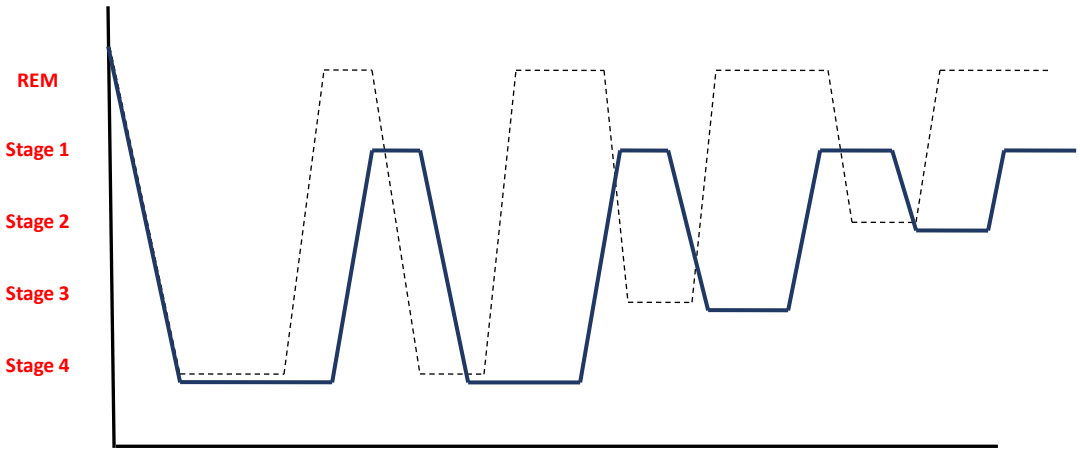

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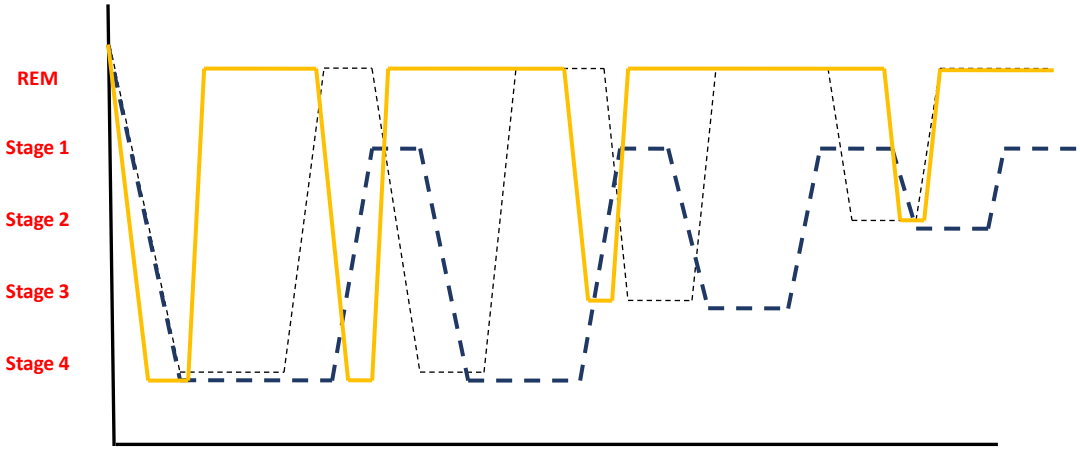

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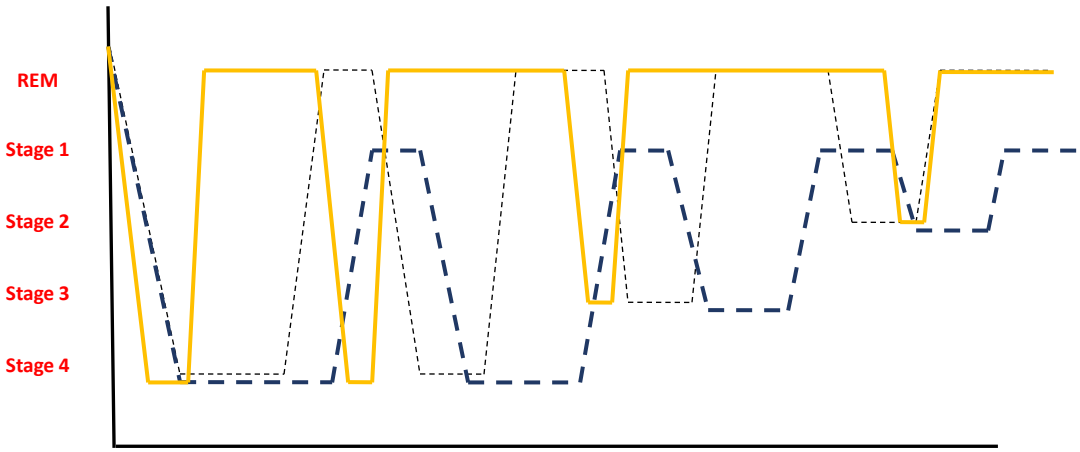

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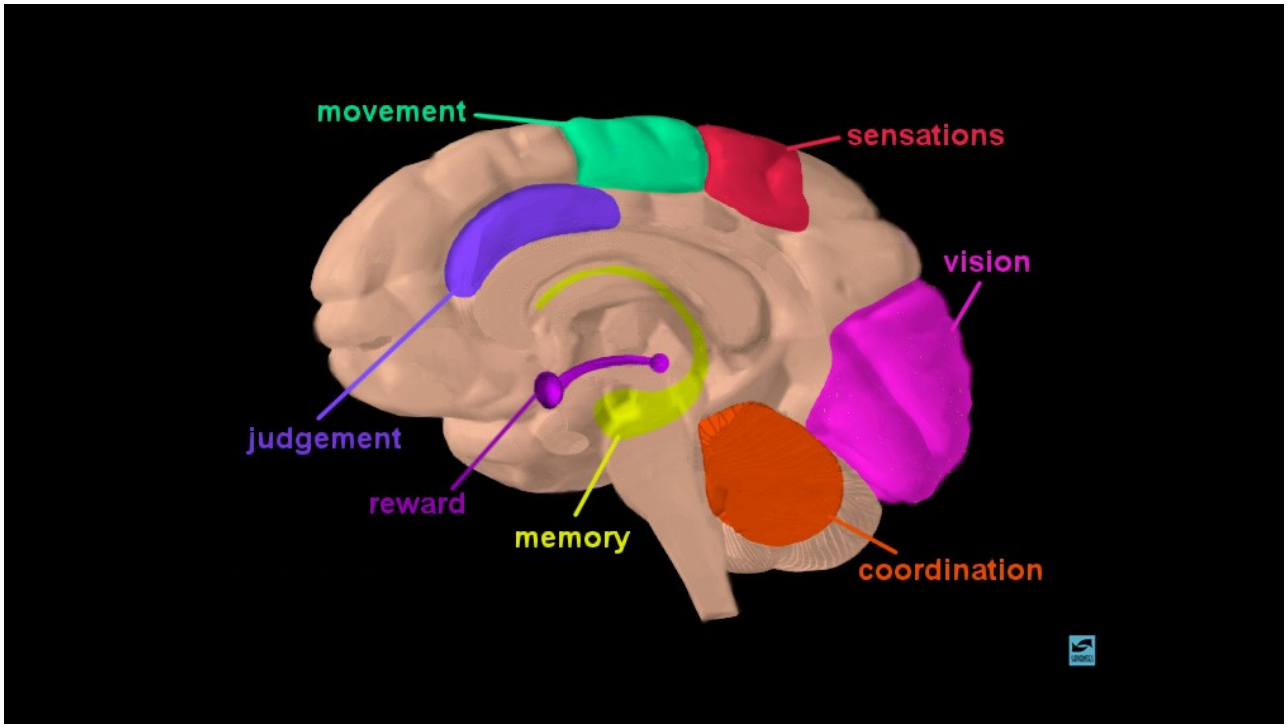
44

A closer look at cannabis

45

Cannabis in 2023 is really potent, and the science is showing that matters…

46


movement
sensations
vision
judgement
reward
memory
coordination

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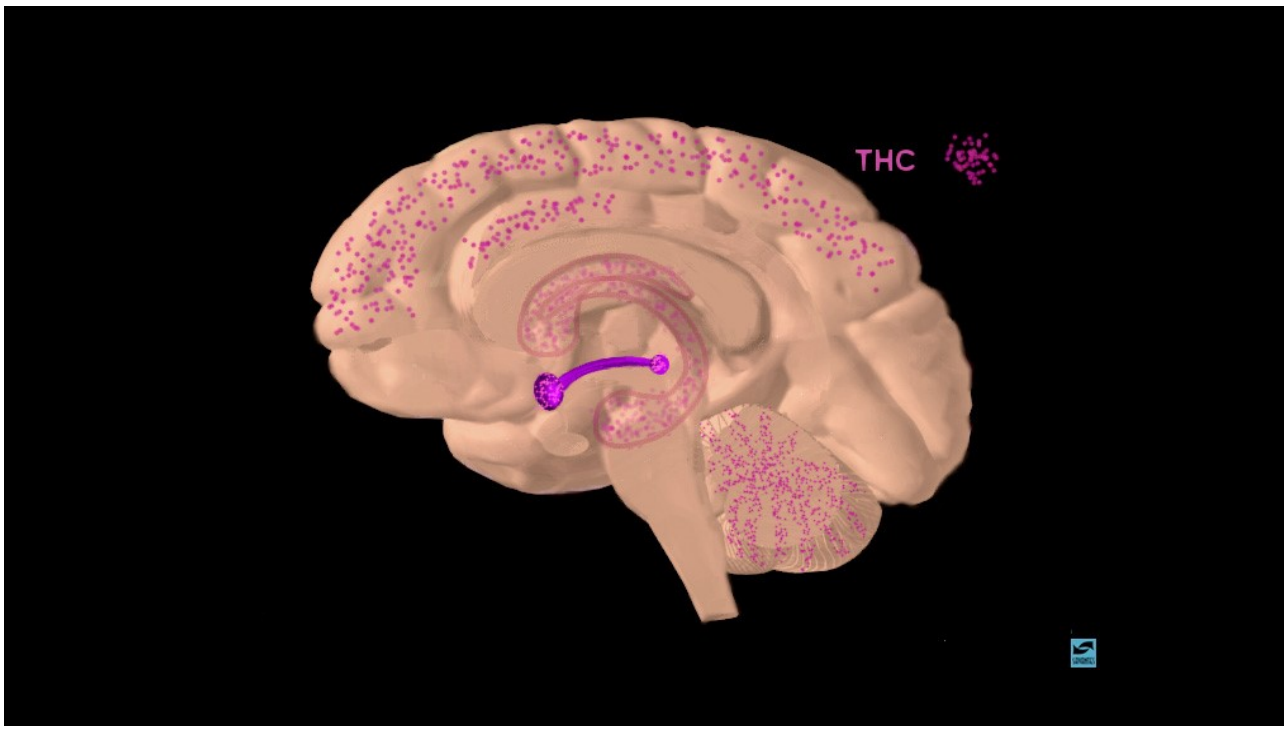
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48

frontiers in PSYCHOLOGY

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Neuroscientific model of motivational process

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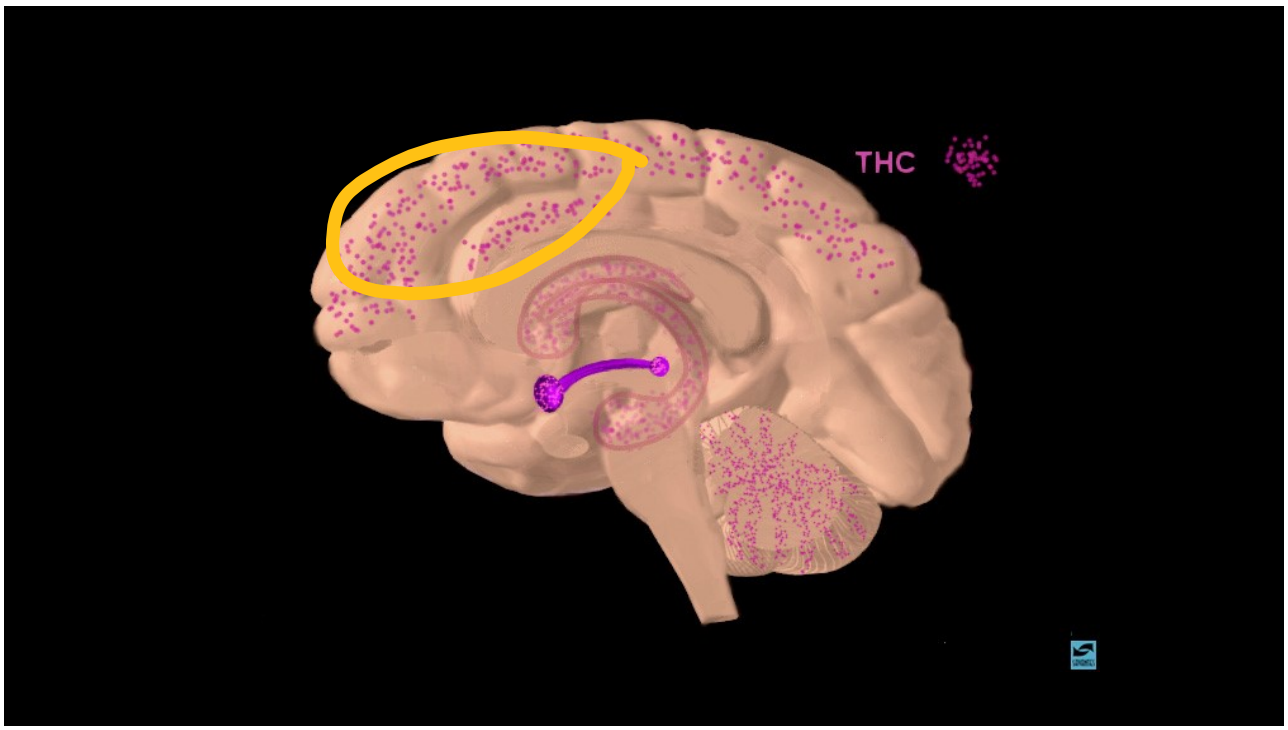
Considering the neuroscientific findings on reward, learning, value, decision-making, and cognitive control, motivation can be parsed into three sub processes, a process of generating motivation, a process of maintaining motivation, and a process of regulating motivation. I propose a tentative neuroscientific model of motivational processes which consists of three distinct but continuous sub processes, namely reward-driven approach, value-based decision-making, and goal-directed control. Reward-driven approach is the process in which motivation is generated by reward anticipation and selective approach behaviors toward reward. This process recruits the ventral striatum (reward area) in which basic stimulus-action association is formed, and is classified as an automatic motivation to which relatively less attention is assigned. By contrast, value-based decision-making is the process of evaluating various outcomes of actions, learning through positive prediction error, and calculating the value continuously. The striatum and the orbitofrontal cortex (valuation area) play crucial roles in sustaining motivation. Lastly, the goal-directed control is the process of regulating motivation through cognitive control to achieve goals. This consciously controlled motivation is associated with higher-level cognitive functions such as planning, retaining the goal, monitoring the performance, and regulating action. The anterior cingulate cortex (attention area) and the dorsolateral prefrontal cortex (cognitive control area) are the main neural circuits related to regulation of motivation. These three sub processes interact with each other by sending reward prediction error signals through dopaminergic pathway from the

"The anterior cingulate cortex (attention area) and the dorsolateral prefrontal cortex (cognitive control area) are the main neural circuits related to regulation of motivation."

49



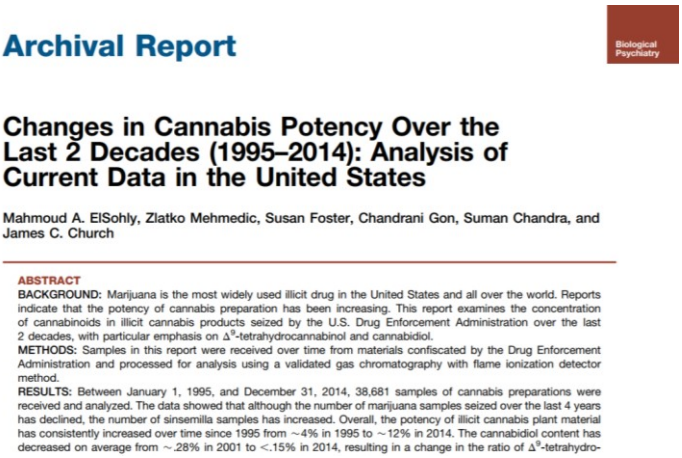
50

What do researchers and scientists consider "high potency" cannabis?

Anything over 10% THC

51

ElSohly, M.A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last 2 decades (1995-2014) – Analysis of current data in the United States. *Biol Psychiatry, 79,* 613-619.



Archival Report

Biological Psychiatry

Changes in Cannabis Potency Over the Last 2 Decades (1995–2014): Analysis of Current Data in the United States

Mahmoud A. ElSohly, Zlatko Mehmedic, Susan Foster, Chandrani Gon, Suman Chandra, and James C. Church

ABSTRACT

BACKGROUND: Marijuana is the most widely used illicit drug in the United States and all over the world. Reports indicate that the potency of cannabis preparation has been increasing. This report examines the concentration of cannabinoids in illicit cannabis products seized by the U.S. Drug Enforcement Administration over the last 2 decades, with particular emphasis on Δ^9-tetrahydrocannabinol and cannabidiol.

METHODS: Samples in this report were received over time from materials confiscated by the Drug Enforcement Administration and processed for analysis using a validated gas chromatography with flame ionization detector method.

RESULTS: Between January 1, 1995, and December 31, 2014, 38,681 samples of cannabis preparations were received and analyzed. The data showed that although the number of marijuana samples seized over the last 4 years has declined, the number of sinsemilla samples has increased. Overall, the potency of illicit cannabis plant material has consistently increased over time since 1995 from ~4% in 1995 to ~12% in 2014. The cannabidiol content has decreased on average from ~.28% in 2001 to <.15% in 2014, resulting in a change in the ratio of Δ^9-tetrahydro-

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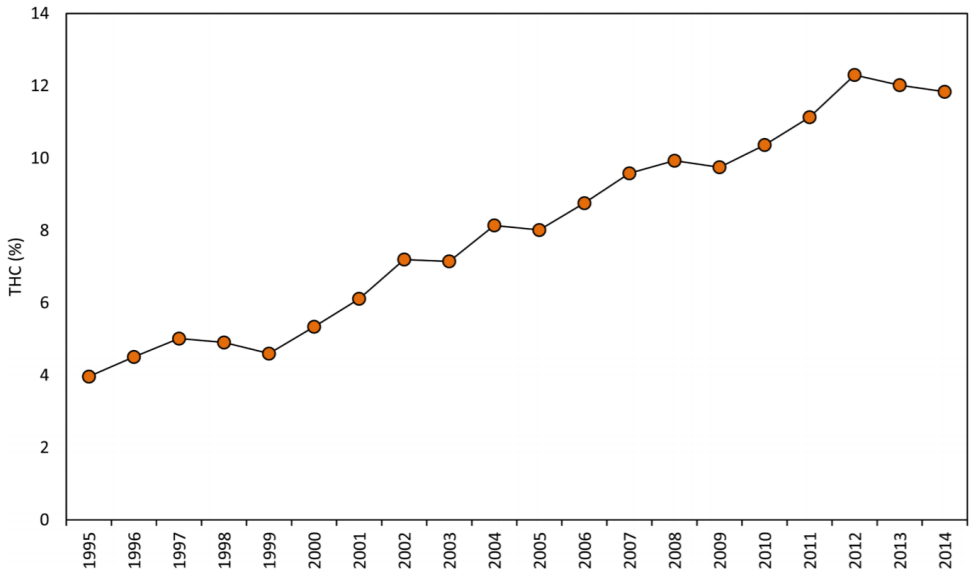

El Sohly, M.A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last two decades (1995-2014) – Analysis of current data in the United States. *Biol Psychiatry, 79,* 613-619.

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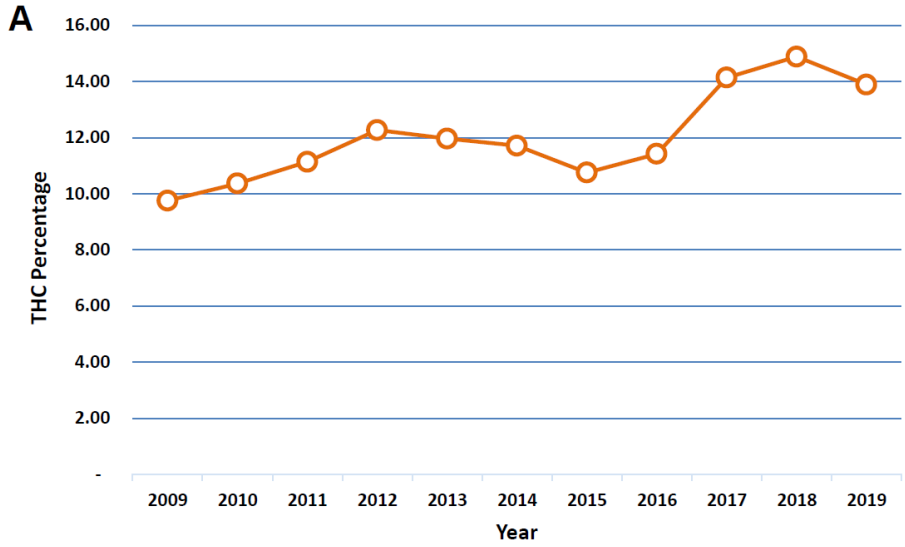

ElSohly, M.A., Chandra, S., Radwan, M., Majumdar, C.G., Church, J.C. (2021). A comprehensive revie of cannabis potency in the United states in the last decade. *Biological Psychiatry: Cognitive Neuroscience, and Neuroimaging, 6,* 603-606.

54

ADDICTION
SSA SOCIETY FOR THE STUDY OF ADDICTION
RESEARCH REPORT
doi:10.1111/add.13886

Variation in cannabis potency and prices in a newly legal market: evidence from 30 million cannabis sales in Washington state

Rosanna Smart[1], Jonathan P. Caulkins[1,2], Beau Kilmer[1], Steven Davenport[1] & Greg Midgette[1]

RAND Corporation, Santa Monica, CA, USA[1] and Heinz College, Carnegie Mellon University, Pittsburgh, PA, USA[2]

ABSTRACT

Aims To (1) assess trends and variation in the market share of product types and potency sold in a legal cannabis retail market and (2) estimate how potency and purchase quantity influence price variation for cannabis flower. **Design** Secondary analysis of publicly available data from Washington State's cannabis traceability system spanning 7 July 2014 to 30 September 2016. Descriptive statistics and linear regressions assessed variation and trends in cannabis

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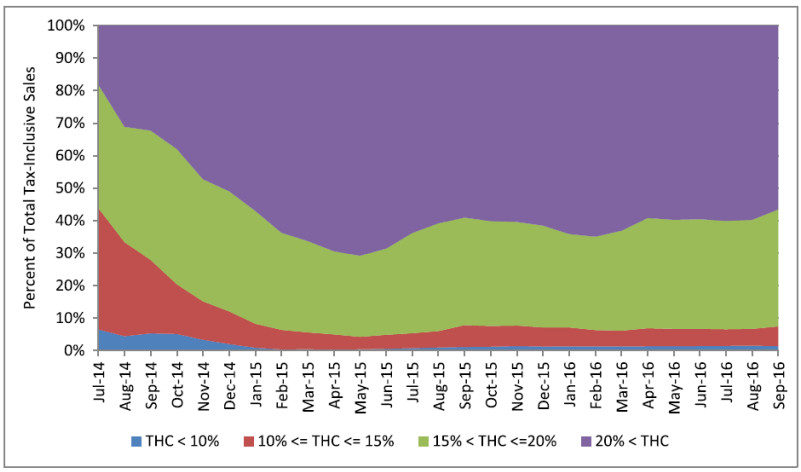
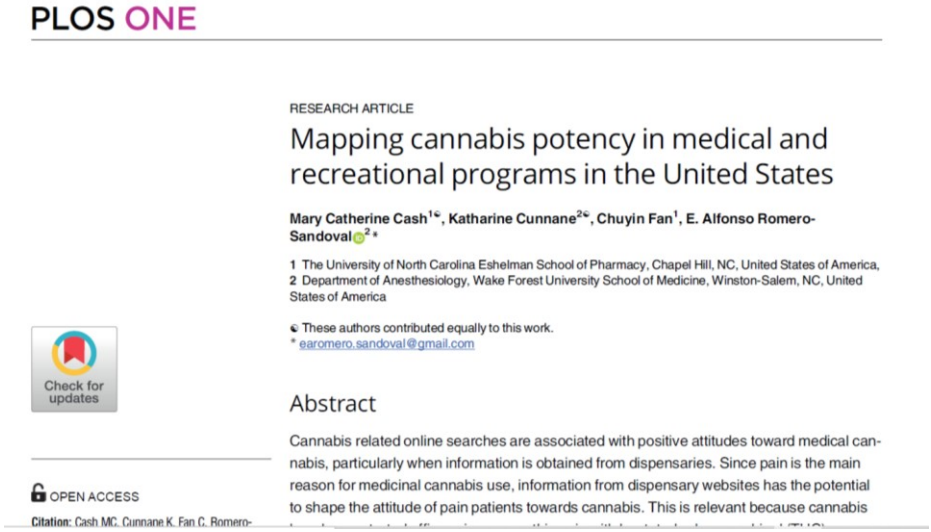


Figure 3 Market shares for cannabis flower products sold, by delta-9-tetrahydrocannabinol (THC) % category. Market share is calculated as a percent of total cannabis flower expenditures (excise-tax-inclusive). [Colour figure can be viewed at wileyonlinelibrary.com]

Smart, R., Caulkins, J.P., Kilmer, B., Davenport, S., & Midgette, G. (2017). Variation in cannabis potency and prices in anewly legal market: Evidence from 30 million cannabis sales in Washington state. *Addiction, 112,* 2167-2177.

56

Cash, M.C., Cunnane, K., Fan, C., Romero-Sandoval, E.A. (2020). Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE 15*(3): e0230167. https://doi.org/10.1371/journal.pone.0230167



PLOS ONE

RESEARCH ARTICLE

Mapping cannabis potency in medical and recreational programs in the United States

Mary Catherine Cash[1☯], Katharine Cunnane[2☯], Chuyin Fan[1], E. Alfonso Romero-Sandoval[2*]

1 The University of North Carolina Eshelman School of Pharmacy, Chapel Hill, NC, United States of America, 2 Department of Anesthesiology, Wake Forest University School of Medicine, Winston-Salem, NC, United States of America

☯ These authors contributed equally to this work.
* earomero.sandoval@gmail.com

Check for updates

OPEN ACCESS

Citation: Cash MC, Cunnane K, Fan C, Romero-

Abstract

Cannabis related online searches are associated with positive attitudes toward medical cannabis, particularly when information is obtained from dispensaries. Since pain is the main reason for medicinal cannabis use, information from dispensary websites has the potential to shape the attitude of pain patients towards cannabis. This is relevant because cannabis

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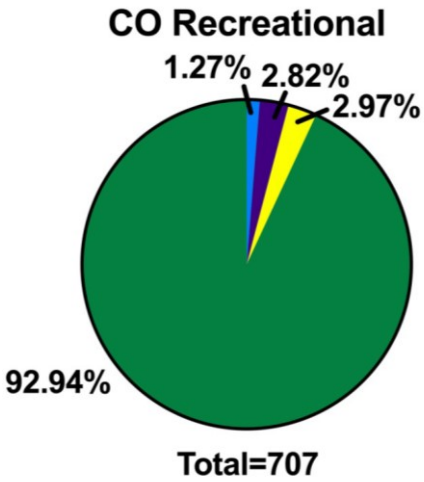

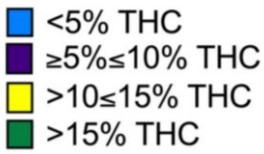

95.91% of Colorado market is "high potency" cannabis

Cash, M.C., Cunnane, K., Fan, C., Romero-Sandoval, E.A. (2020). Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE 15*(3): e0230167. https://doi.org/10.1371/journal.pone.0230167

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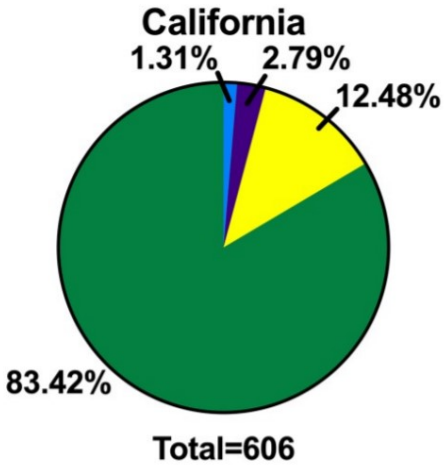

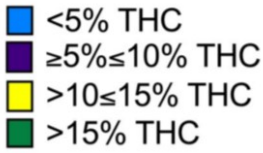

95.90% of California market is "high potency" cannabis

Cash, M.C., Cunnane, K., Fan, C., Romero-Sandoval, E.A. (2020). Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE 15*(3): e0230167. https://doi.org/10.1371/journal.pone.0230167

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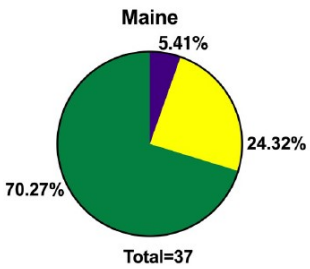

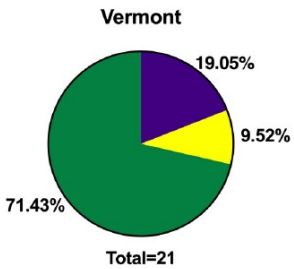

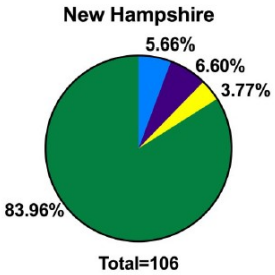

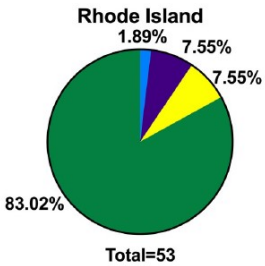

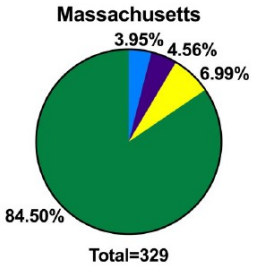

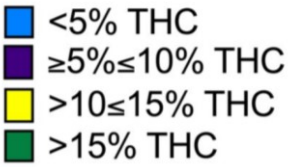

Cash, M.C., Cunnane, K., Fan, C., Romero-Sandoval, E.A. (2020). Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE 15*(3): e0230167. https://doi.org/10.1371/journal.pone.0230167

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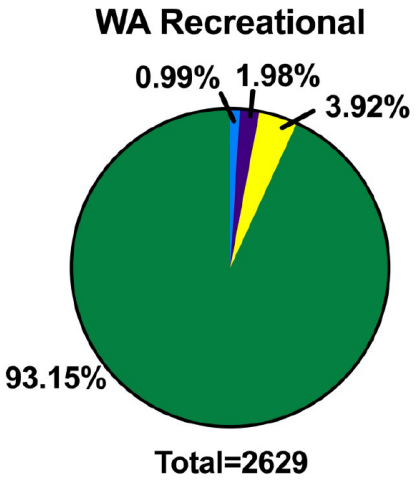


97.07% of Washington market is "high potency" cannabis

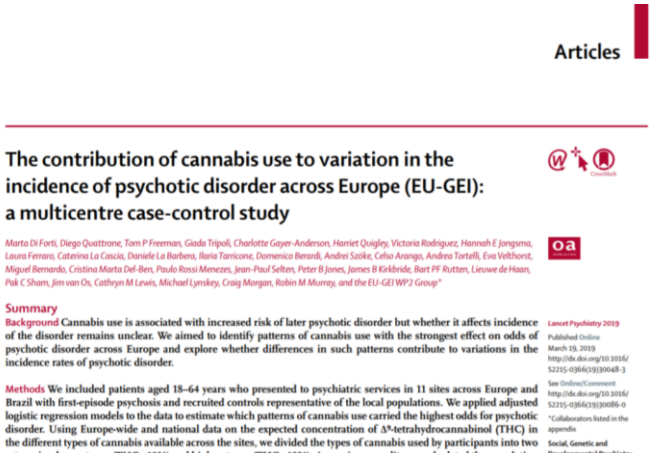
Cash, M.C., Cunnane, K., Fan, C., Romero-Sandoval, E.A. (2020). Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE 15*(3): e0230167. https://doi.org/10.1371/journal.pone.0230167

61

Why potency matters

62

DiForti, M., Quattrone, D., Freeman, T.P., Tripoli, G., et al. (2019). The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): A multicenter case-control study. *Lancet Psychiatry, 6* (5), 426-436.



Articles

The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study

Marta Di Forti, Diego Quattrone, Tom P Freeman, Giada Tripoli, Charlotte Gayer-Anderson, Harriet Quigley, Victoria Rodriguez, Hannah E Jongsma, Laura Ferraro, Caterina La Cascia, Daniele La Barbera, Ilaria Tarricone, Domenico Berardi, Andrei Szöke, Celso Arango, Andrea Tortelli, Eva Velthorst, Miguel Bernardo, Cristina Marta Del-Ben, Paulo Rossi Menezes, Jean-Paul Selten, Peter B Jones, James B Kirkbride, Bart PF Rutten, Lieuwe de Haan, Pak C Sham, Jim van Os, Cathryn M Lewis, Michael Lynskey, Craig Morgan, Robin M Murray, and the EU-GEI WP2 Group*

Summary

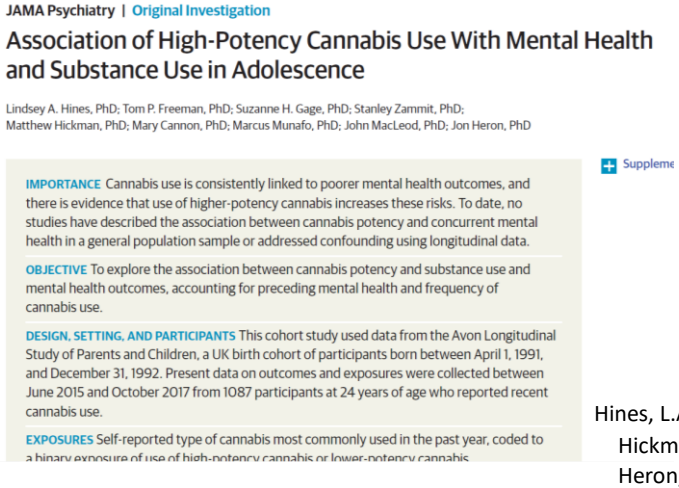
Background Cannabis use is associated with increased risk of later psychotic disorder but whether it affects incidence of the disorder remains unclear. We aimed to identify patterns of cannabis use with the strongest effect on odds of psychotic disorder across Europe and explore whether differences in such patterns contribute to variations in the incidence rates of psychotic disorder.

Methods We included patients aged 18–64 years who presented to psychiatric services in 11 sites across Europe and Brazil with first-episode psychosis and recruited controls representative of the local populations. We applied adjusted logistic regression models to the data to estimate which patterns of cannabis use carried the highest odds for psychotic disorder. Using Europe-wide and national data on the expected concentration of Δ⁹-tetrahydrocannabinol (THC) in the different types of cannabis available across the sites, we divided the types of cannabis used by participants into two

Lancet Psychiatry 2019
Published Online March 19, 2019
http://dx.doi.org/10.1016/S2215-0366(19)30048-3
See Online/Comment http://dx.doi.org/10.1016/S2215-0366(19)30086-0
*Collaborators listed in the appendix
Social, Genetic and

Increased risk of psychosis

63



JAMA Psychiatry | Original Investigation

Association of High-Potency Cannabis Use With Mental Health and Substance Use in Adolescence

Lindsey A. Hines, PhD; Tom P. Freeman, PhD; Suzanne H. Gage, PhD; Stanley Zammit, PhD; Matthew Hickman, PhD; Mary Cannon, PhD; Marcus Munafo, PhD; John MacLeod, PhD; Jon Heron, PhD

IMPORTANCE Cannabis use is consistently linked to poorer mental health outcomes, and there is evidence that use of higher-potency cannabis increases these risks. To date, no studies have described the association between cannabis potency and concurrent mental health in a general population sample or addressed confounding using longitudinal data.

OBJECTIVE To explore the association between cannabis potency and substance use and mental health outcomes, accounting for preceding mental health and frequency of cannabis use.

DESIGN, SETTING, AND PARTICIPANTS This cohort study used data from the Avon Longitudinal Study of Parents and Children, a UK birth cohort of participants born between April 1, 1991, and December 31, 1992. Present data on outcomes and exposures were collected between June 2015 and October 2017 from 1087 participants at 24 years of age who reported recent cannabis use.

EXPOSURES Self-reported type of cannabis most commonly used in the past year, coded to a binary exposure of use of high-potency cannabis or lower-potency cannabis

Supplemental

Increased risk of addiction and generalized anxiety disorder

Hines, L.A., Freeman, T.P, Gage, S.H., Zammit, S., Hickman,M., Cannon, M., Munafo, M., MacLeod, J., & Heron, J. (2020). Association of high-potency cannabis use with mental health and substance use in adolescence. *JAMA Psychiatry, 77,* 1044-1051. doi: 10.1001/jamapsychiatry.2020.1035.

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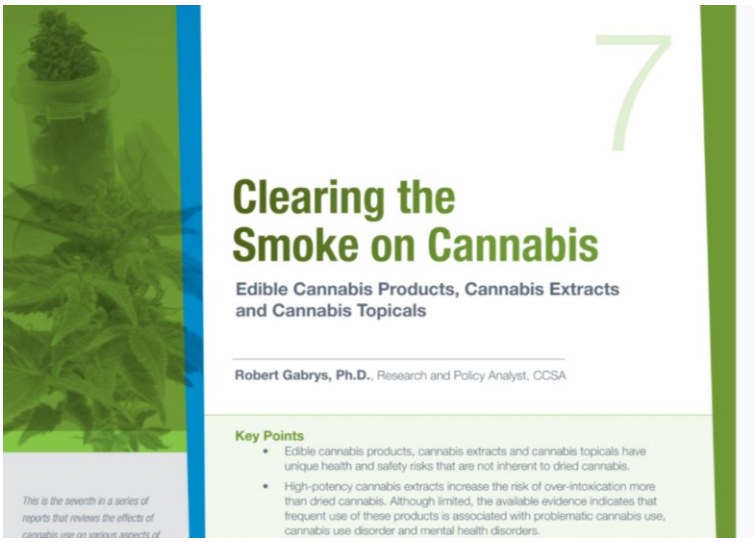

For concentrates/ extracts, more association with "problematic cannabis use, cannabis use disorder, and mental health disorders." -- Gabrys (2020)

Gabrys, R. (2020). *Clearing the Smoke on Cannabis: Edible Cannabis Products, Cannabis Extracts and Cannabis Topicals.* Canadian Centre on Substance Use and Addiction.

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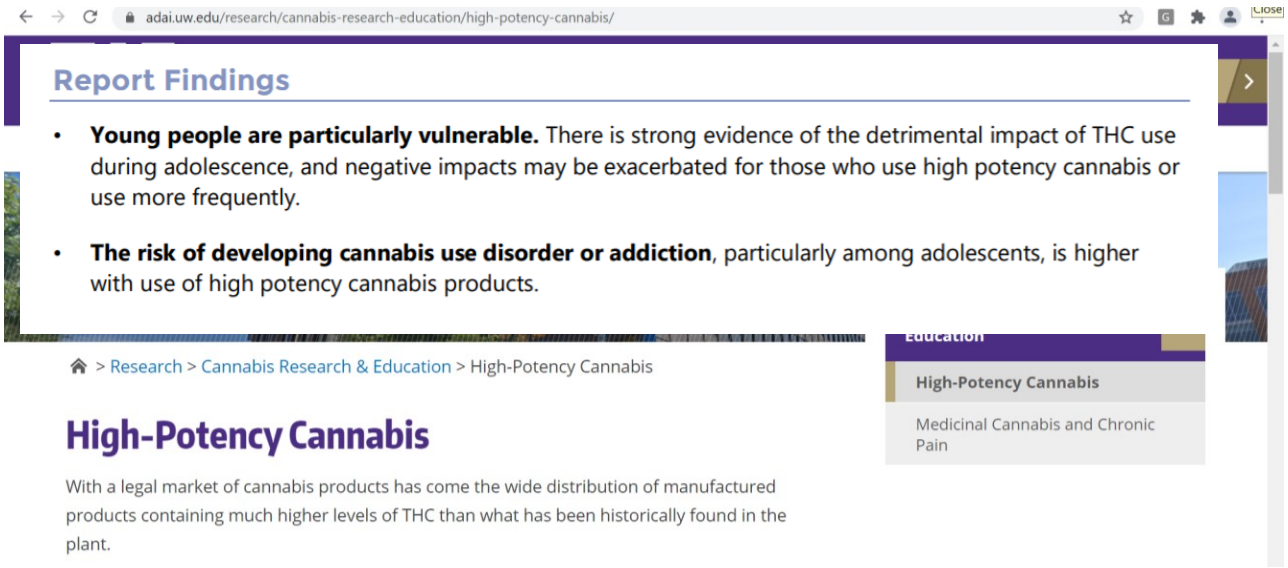

https://adai.uw.edu/cerp/high-potency-cannabis/

66

We need to be mindful of individuals who may be struggling with anxiety, depressed mood, sleep difficulties, and other issues, particularly if they're declining referrals for counseling/health and say they want to use cannabis for medical purposes instead

67

JOURNAL OF PSYCHOACTIVE DRUGS
2017, VOL. 49, NO. 5, 393–397
https://doi.org/10.1080/02791072.2017.1354409

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Check for updates

Placebo Effects of Edible Cannabis: Reported Intoxication Effects at a 30-Minute Delay

Mallory J. E. Loflin, Ph.D.[a], Mitch Earleywine, Ph.D.[b], Stacey Farmer, M.A.[c], Melissa Slavin, M.A.[c], Rachel Luba, B.S.[c], and Marcel Bonn-Miller, Ph.D.[d]

[a]Fellow, National Center for PTSD Training and Dissemination Division, VA Palo Alto Health Care System, Menlo Park, CA, USA; [b]Professor, Department of Psychology, University at Albany SUNY, Albany, NY, USA; [c]Graduate Student, Department of Psychology, University at Albany SUNY, Albany, NY, USA; [d]Adjunct Assistant Professor, Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

ABSTRACT

Previous research has demonstrated the ability of non-active smoked cannabis cigarettes to induce subjective effects of intoxication (i.e., placebo effect). No studies have been conduced to test whether edible forms of cannabis, which are associated with a significant delay in onset of effect, are able to induce a placebo effect. In the present study, 20 participants were told that they would receive an edible cannabis lollipop containing a high dose of tetrahydrocannabinol (THC), but were instead given a placebo control. Measures of intoxication and mood were taken at baseline, 30 minutes, and 60 minutes post-ingestion of the placebo lollipop. Results of four repeated-measures ANOVAs found significant and quadratic changes across time in cannabis (ARCI m-scale) intoxication ($F(2,18) = 4.90$, $p = .01$, $\eta^2 = .22$) and negative mood ($F(2,18) = 3.99$, $p = .05$, $\eta^2 = .19$). Changes in positive mood and the overall measure of general intoxication (ARCI) failed to reach significance. The present study provides preliminary evidence that a placebo effect can be induced with inert edible agents when participants are told that they are receiving active THC. This is the first known study to demonstrate an edible cannabis intoxication placebo effect.

ARTICLE HISTORY
Received 12 January 2017
Revised 18 April 2017
Accepted 8 May 2017

KEYWORDS
Cannabis; edibles; expectancy; marijuana; placebo

Loflin, et al., 2017

68

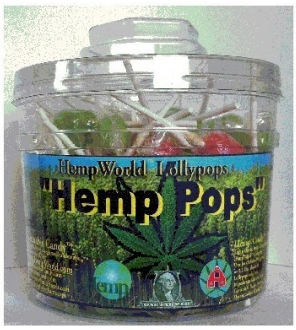
Loflin, et al. (2017)

- Asked participants to refrain at least 8 hours before study
- Told to plan for a variable end (1.5-6 hours depending on dose they would receive)
- Told they would be in one of three rooms (no dose, low THC, high THC)
- Cubicles (no interaction), and had to rate music and comedy clips, color designs, and compute math problems

69

Loflin, et al. (2017)

- Used Hemp Pops
  - Hemp seed oil (no active elements of THC or CBD), glucose syrup, citric acid, sugar, natural flavors, and colors #2 and #5



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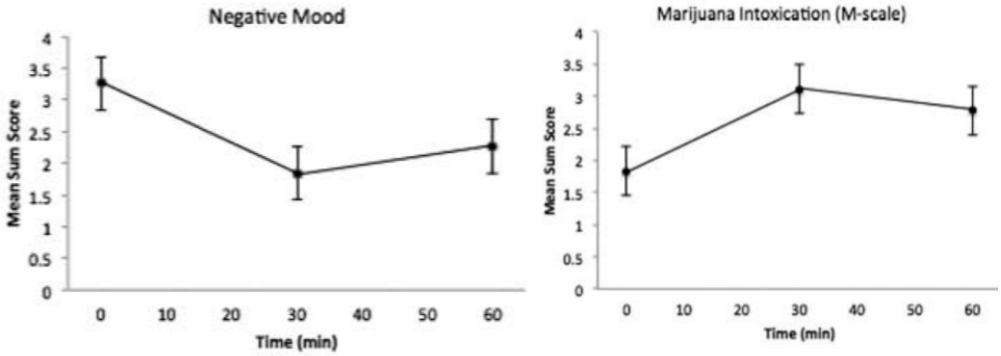


71

Doctors should think twice before prescribing medical marijuana: guideline Source: CTVNews.com

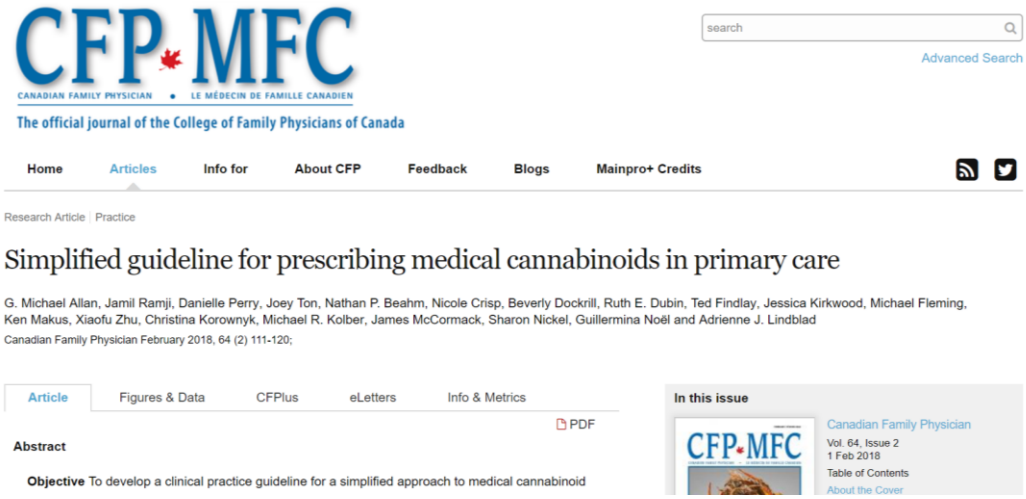
New guideline warns pain benefits of medical cannabis overstated
University of Alberta led guideline warns health risks may outweigh benefits, provides guidance on when (and when not to) prescribe.

Source: ScienceDaily.com

Canadian Doctors Warn Medical Pot Is Overhyped Source: Gizmodo.com

72

Allan, G.M., Ramji, J., Perry, D., Ton, J., Beahm, N.P., Crisp, N., Dockrill, B., Dublin, R.E., Findlay, T., Kirkwood, J., Fleming, M., Makus, K., Zhu, X., Korownyk, C., Kolber, M., McCormack, J., Nickel, S., Guillermina, N., & Lindblad, A.J. (2018). Simplified guidelines for prescribing medical cannabinoids in primary care. *Canadian Family Physician, 64,* 111-120.



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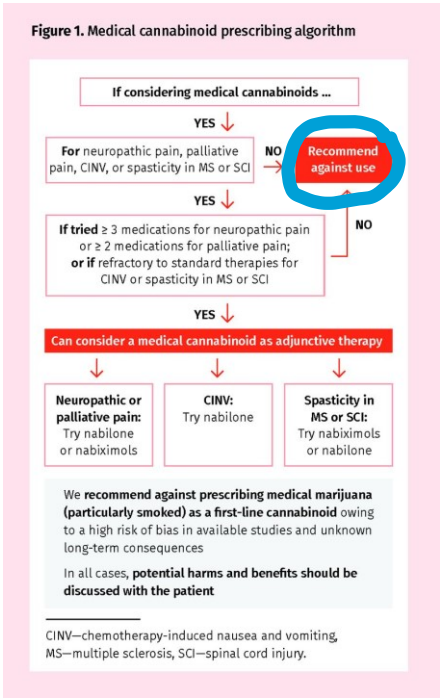


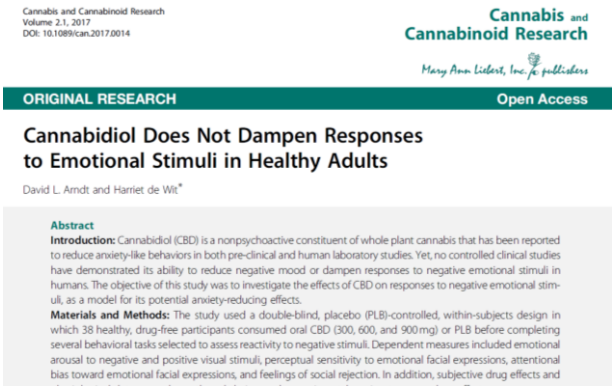
Only are recommending for neuropathic pain, palliative and end-of-life pain, chemotherapy-induced nausea and vomiting, and spasticity due to multiple sclerosis or spinal cord injury…

AND

If tried traditional therapies/treatments first…

Allan, et al. (2018)

74



Cannabis and Cannabinoid Research
Volume 2.1, 2017
DOI: 10.1089/can.2017.0014

Cannabis and Cannabinoid Research
Mary Ann Liebert, Inc. publishers

ORIGINAL RESEARCH Open Access

Cannabidiol Does Not Dampen Responses to Emotional Stimuli in Healthy Adults

David L. Arndt and Harriet de Wit*

Abstract

Introduction: Cannabidiol (CBD) is a nonpsychoactive constituent of whole plant cannabis that has been reported to reduce anxiety-like behaviors in both pre-clinical and human laboratory studies. Yet, no controlled clinical studies have demonstrated its ability to reduce negative mood or dampen responses to negative emotional stimuli in humans. The objective of this study was to investigate the effects of CBD on responses to negative emotional stimuli, as a model for its potential anxiety-reducing effects.

Materials and Methods: The study used a double-blind, placebo (PLB)-controlled, within-subjects design in which 38 healthy, drug-free participants consumed oral CBD (300, 600, and 900 mg) or PLB before completing several behavioral tasks selected to assess reactivity to negative stimuli. Dependent measures included emotional arousal to negative and positive visual stimuli, perceptual sensitivity to emotional facial expressions, attentional bias toward emotional facial expressions, and feelings of social rejection. In addition, subjective drug effects and

"This study suggests that oral CBD does not alter responses to emotional stimuli, or produce anxiolytic-like effects in healthy human subjects. (p. 112)"

Arndt & de Wit (2017)

75

JAMA Network | Open

Original Investigation | Psychiatry

Effect of Medical Marijuana Card Ownership on Pain, Insomnia, and Affective Disorder Symptoms in Adults
A Randomized Clinical Trial

Jodi M. Gilman, PhD; Randi M. Schuster, PhD; Kevin W. Potter, PhD; William Schmitt, BA; Grace Wheeler, BA; Gladys N. Pachas, MD; Sarah Hickey, BSN; Megan E. Cooke, PhD; Alyson Dechert, BA; Rachel Plummer, BA; Brenden Tervo-Clemmens, PhD; David A. Schoenfeld, PhD; A. Eden Evins, MD, MPH

Abstract

IMPORTANCE Despite the legalization and widespread use of cannabis products for a variety of medical concerns in the US, there is not yet a strong clinical literature to support such use. The risks and benefits of obtaining a medical marijuana card for common clinical outcomes are largely unknown.

OBJECTIVE To evaluate the effect of obtaining a medical marijuana card on target clinical and cannabis use disorder (CUD) symptoms in adults with a chief concern of chronic pain, insomnia, or anxiety or depressive symptoms.

DESIGN, SETTING, AND PARTICIPANTS This pragmatic, single-site, single-blind randomized clinical trial was conducted in the Greater Boston area from July 1, 2017, to July 31, 2020. Participants

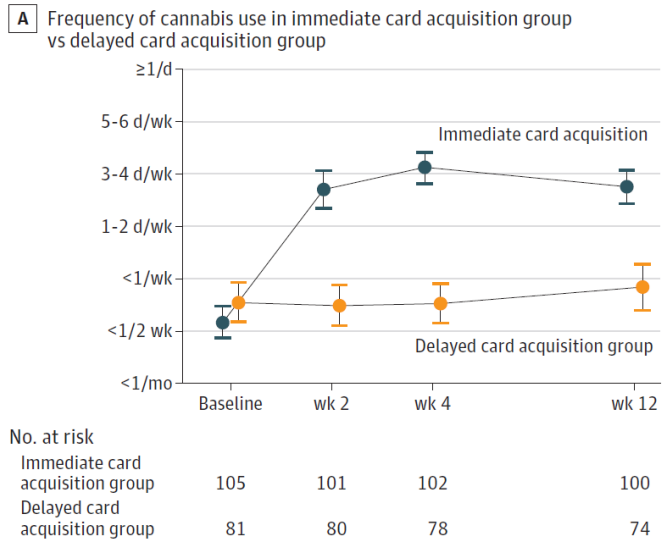
Key Points

Question What are the risks and benefits of obtaining a medical marijuana card for adults who seek medical marijuana for pain, insomnia, and anxiety or depressive symptoms?

Findings In this randomized clinical trial involving 186 participants, immediate acquisition of a medical marijuana card increased the incidence and severity of cannabis use disorder (CUD) and resulted in no significant improvement

Gilman, et al. (2022) (released 3/18/2022)

76



Gilman, et al. (2022) (released 3/18/2022)

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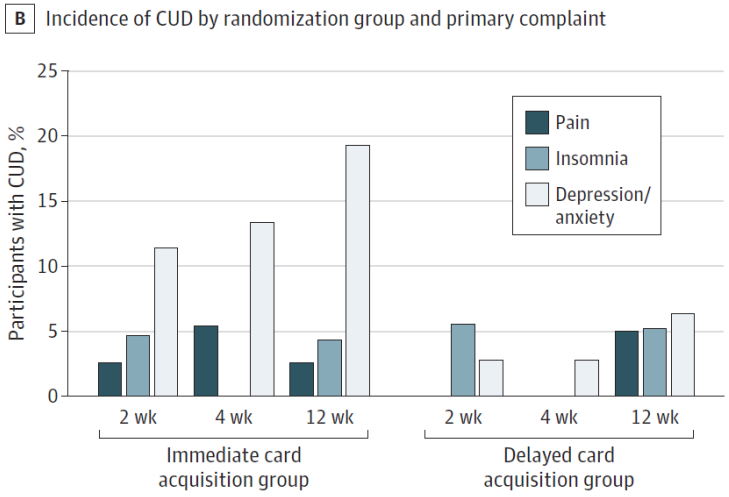


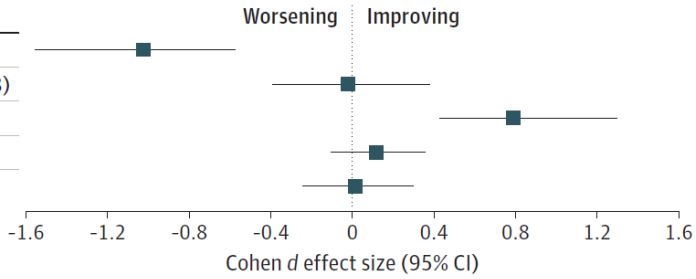
Gilman, et al. (2022) (released 3/18/2022)

78

Figure 3. Effect Sizes for Primary, Secondary, and Exploratory Outcomes

A Primary outcomes

Source	Cohen *d* effect size (95% CI)
CUD symptoms	1.02 (0.57 to 1.55)
Pain severity	-0.02 (-0.39 to 0.38)
Insomnia	0.79 (0.43 to 1.30)
Depression	0.12 (-0.11 to 0.36)
Anxiety	0.02 (-0.24 to 0.30)



"There were no observed benefits of obtaining a medical marijuana card for pain, anxiety, or depressive symptoms. (p. 11)"

Gilman, et al. (2022) (released 3/18/2022)

79

- Those with affective disorders have 3.9 higher odds of meeting criteria for Cannabis Use Disorder
- "These data suggest that a medical marijuana card may pose a high risk or may even be contraindicated for people with affective disorders. This finding is important to replicate because depression has been reported as the third most common reason that people seek a medical marijuana card." (page 10)

Gilman, et al. (2022) (released 3/18/2022)

80

Separating reported medical use from management of withdrawal

81

Motivations for Use

	Motive Category	Proportion of participants endorsing motive	Proportion of primary motives
Enjoyment/fun	Enjoyment/fun (e.g., be happy, get high, enjoy feeling)	52.14%	24.03%
	Conformity (e.g., peer pressure, friends do it)	42.81%	16.40%
	Experimentation (e.g., new experience, curiosity)	41.25%	29.36%
Social enhancement	Social enhancement (e.g., bonding with friends, hang out)	25.71%	8.66%
Boredom	Boredom (e.g., something to do, nothing better to do)	25.08%	4.15%
	Relaxation (e.g., to relax, helps me sleep)	24.64%	6.97%
	Coping (e.g., depressed, relieve stress)	18.14%	5.10%
	Availability (e.g., easy to get, it was offered)	13.74%	2.23%
	Relative low risk (e.g., low health risk, no hangover)	10.88%	0.95%
Altered perception	Altered perception or perspectives (e.g., to enhance experiences, makes things more fun)	10.58%	1.81%
Activity enhancement	Activity enhancement (e.g., music sounds better, every day activities more interesting)	5.68%	0.80%
	Rebellion (e.g., rebelling against parents, thrill of something illegal)	5.21%	0.32%
	Alcohol intoxication (e.g., I was drunk)	4.42%	0.47%
	Food enhancement (e.g., enjoy good food, food tastes better)	3.79%	0.00%
	Anxiety reduction (e.g., be less shy, feel less insecure)	3.31%	0.00%
Image enhancement	Image enhancement (e.g., to be cool, to feel cool)	2.85%	0.32%
Celebration	Celebration (e.g., special occasion, to celebrate)	1.26%	0.16%
	Medical use (e.g., alleviate physical pain, have a headache)	1.26%	0.16%
	Habit (e.g., feeling was addictive, became a habit)	0.95%	0.00%

Lee, Neighbors & Woods (2007)

82

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Relaxation (includes helping w/sleep)

Coping (includes when depressed)

Food motives

Anxiety reduction

Medical use (including pain and headache)

Lee, Neighbors & Woods (2007)

83

Withdrawal: Cannabis

Diagnostic Criteria **292.0 (F12.288)**

A. Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of at least a few months).

B. Three (or more) of the following signs and symptoms develop within approximately 1 week after Criterion A:

1. Irritability, anger, or aggression.
2. Nervousness or anxiety.
3. Sleep difficulty (e.g., insomnia, disturbing dreams).
4. Decreased appetite or weight loss.
5. Restlessness.
6. Depressed mood.
7. At least one of the following physical symptoms causing significant discomfort: abdominal pain, shakiness/tremors, sweating, fever, chills, or headache.

C. The signs or symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal from another substance.

84

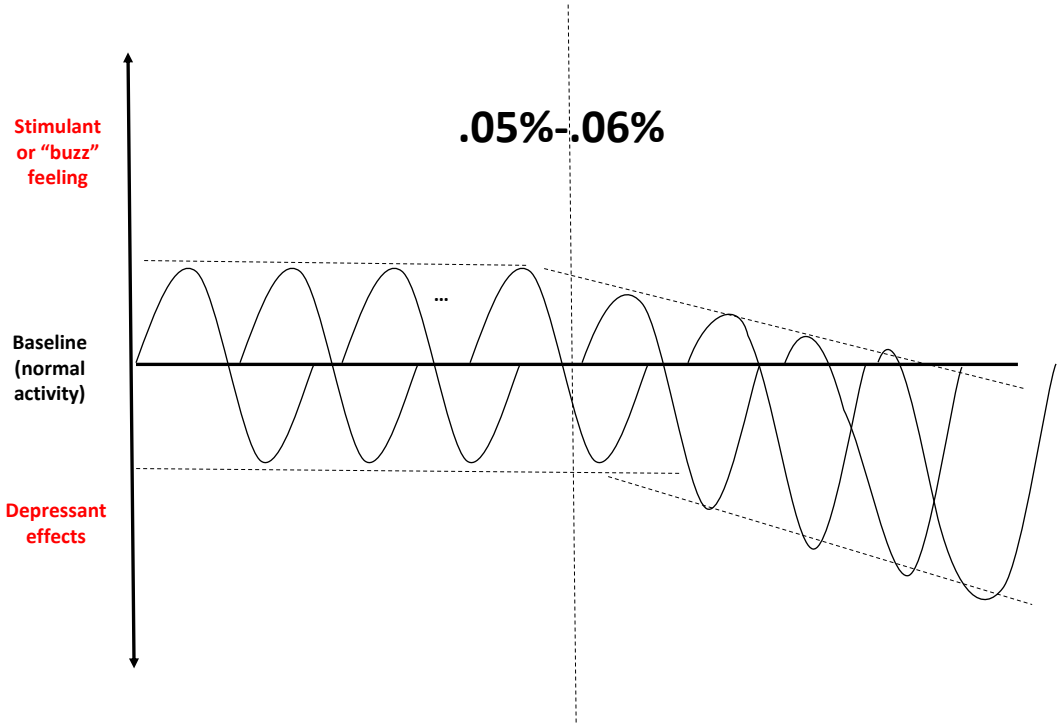
Strategies for reducing harm (when appropriate given the population you're working with and the setting you are in)

85

Questions…

- When people start to lose their buzz, what do they usually do?
- Do they ever get that same buzz back?

86



87

Specific Tips for Reducing the Risk of Alcohol Use

- **Set limits**

88

Setting a Limit

180 pound female

Number of Drinks	Number of Hours					
	1	2	3	4	5	6
1	.009	0	0	0	0	0
2	.034	.018	.002	0	0	0
3	.059	.043	.027	.011	0	0
4	.084	.068	.052	.036	.020	.004
5	.109	.093	.077	.061	.045	.029
6	.134	.118	.102	.086	.070	.054
7	.159	.143	.127	.111	.095	.079
8	.184	.168	.152	.136	.120	.104
9	.209	.193	.177	.161	.145	.129
10	.234	.218	.202	.186	.170	.154
11	.259	.243	.227	.211	.195	.179
12	.284	.268	.252	.236	.220	.204

180 pound male

Number of Drinks	Number of Hours					
	1	2	3	4	5	6
1	.005	0	0	0	0	0
2	.026	.010	0	0	0	0
3	.047	.031	.015	0	0	0
4	.067	.051	.035	.019	.003	0
5	.088	.072	.056	.040	.024	.008
6	.109	.093	.077	.061	.045	.029
7	.130	.114	.098	.082	.066	.050
8	.151	.135	.119	.103	.087	.071
9	.172	.156	.140	.124	.108	.092
10	.192	.176	.160	.144	.128	.112
11	.213	.197	.181	.165	.149	.133
12	.234	.218	.202	.186	.170	.154

89

Specific Tips for Reducing the Risk of Alcohol Use

- **Set limits**
- **Eat prior to or while drinking**
- **Keep track of how much you drink**
- **Space your drinks**
  - **Alternate alcoholic drinks w/non-alcoholic drinks**
- **Avoid trying to "out drink" or keep up with others**
- **Avoid or alter approach to drinking games**
- **If you choose to drink, drink slowly**
- **Use a designated driver**
- **Don't accept a drink when you don't know what's in it**
- **Have a friend let you know when you've had enough**
- **Avoid combining alcohol with cannabis** (or other substances)

90

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Review

Lower-Risk Cannabis Use Guidelines (LRCUG) for reducing health harms from non-medical cannabis use: A comprehensive evidence and recommendations update

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91

General Precaution A:

"There is no universally safe level of cannabis use; thus, the only reliable way to avoid any risk for harm from using cannabis is to abstain from its use."

92

Among other recommendations:

- People who use cannabis should use low potency cannabis products
- "Overall, there is no categorically 'safe' route of use for cannabis and each route option brings some level of distinct risks that needs to be taken into account for use. " That said, smoking is particularly risky.
- Keep use occasional (no more than 1 or 2 days a week, weekend only)
- If a person notices impacts to attention, concentration, or memory, "consider temporarily suspending or substantially reducing the intensity (e.g., frequency/potency) of their cannabis use."
- Avoid driving while under the influence (waiting at least 6-8 hours after inhaling, 8-12 hours after use of edibles)

93

Recommendation #11: ***Some specific groups of people are at elevated risk for cannabis use-related health problems because of biological pre-dispositions or co-morbidities. They should accordingly (and possibly on medical advice as required) avoid or adjust their cannabis use.*** Higher risks for harm extend to individuals with a genetic predisposition (e.g., a first-degree family or personal history) for, or an active psychosis, mood (e.g., depressive) disorder, or substance use disorder.

94

Wrapping up

95

(1) Consider screening for alcohol use, cannabis use, depressive symptoms, and/or thoughts of suicide

96

(2) Go a step further with SBIRT, especially since motivational enhancement-based brief interventions show success

97

Screening: Universal screening for quickly assessing use/severity/risks

Brief **I**ntervention: Motivational/awareness-raising intervention to prompt contemplation of or commitment to change

Referral to **T**reatment: Referral to specialty care or follow-ups

98

(3) Do what you can to increase the chance that people can get connected to services and overcome barriers

99

There are people who could benefit from services who might not be getting them

- **72% of college students who screened positive for major depression felt they needed help**
- **Only 36% of students received medication or therapy of any kind**

Source: Eisenberg, et al., (2007)

100

Depression

- Factors related to not accessing services:
  - Unaware of or unfamiliar with service options
  - Questioned helpfulness of therapy or medication
  - Uncertainty about insurance coverage for mental health visits
  - Less use by students who reported growing up in "poor family"
  - Less use by those identifying as Asian or Pacific Islander

Source: Eisenberg, et al., (2007)

101

Depression

- Factors related to not accessing services:
  - Reasons identified by students:
    - Lack of perceived need
    - Belief that stress is normal
    - Lack of time

Source: Eisenberg, et al., (2007)

102

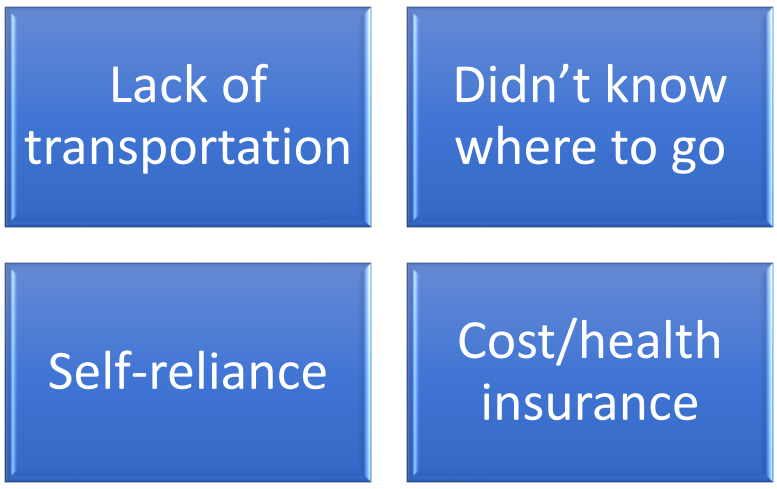
Need for service vs. access

- **26% of young adults said they needed mental health services but didn't receive them within the past 12 months**
  - **Among young adults with depressive symptoms:**
    - **43% said they needed mental health services but didn't receive them within the past 12 months**
    - **40% received mental health services (similar to the 36% cited by Eisenberg 12 years earlier)**

Cadigan, Lee, & Larimer, 2019

103

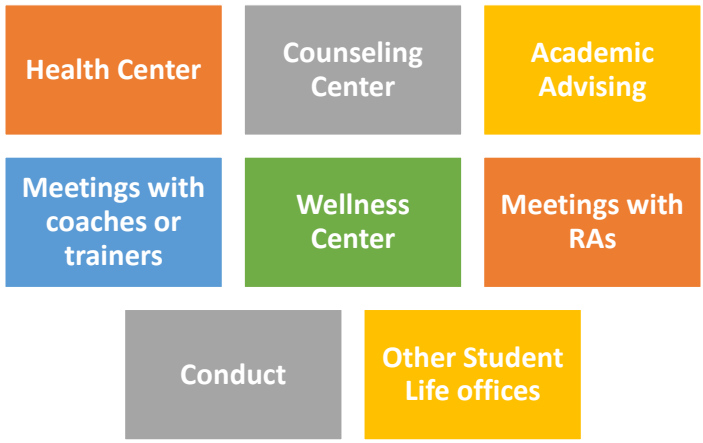
Identifying and Reducing Barriers to Accessing Care



Cadigan, Lee, & Larimer, 2019

104

Students may not always seek help for these issues, but they do go to…



105

Each of these settings provides the opportunity to…

- Formally screen
- Informally screen
- Provide brief intervention (where ethical and applicable)
- Point people in the direction of other support services

106

Can Screen For…

- **Depression**
- **Alcohol use disorder**
- **Cannabis use disorder**
- **Other substance use**
- **Body image issues**
- **Interpersonal Violence**
- **Connectedness/support**

107

Implementation strategies are key

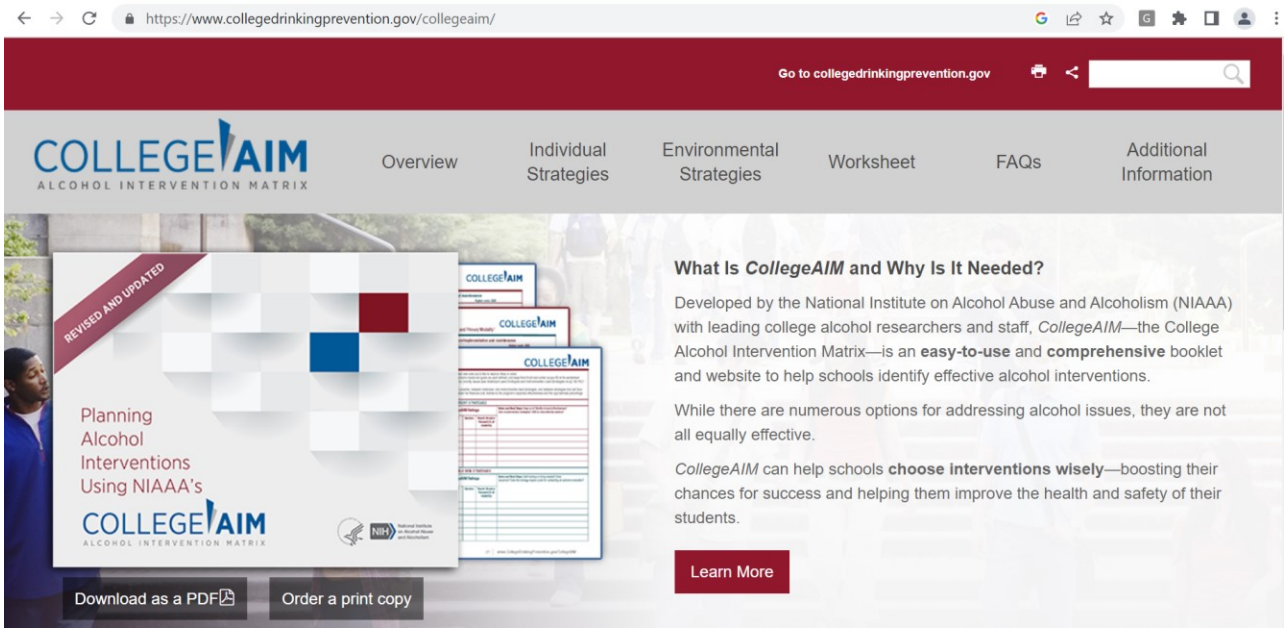
"…the use of effective interventions on a scale sufficient to benefit society requires careful attention to implementation strategies as well. One without the other is like serum without a syringe; the cure is available, but the delivery system is not." (p. 448)

Fixsen, D. L., Blase, K. A., Duda, M. A., Naoom, S. F., & Van Dyke, M. (2010). Implementation of evidence-based treatments for children and adolescents: Research findings and their implications for the future. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (p. 435–450). The Guilford Press

108

If there's a limited budget for prevention, invest in evidence-based strategies

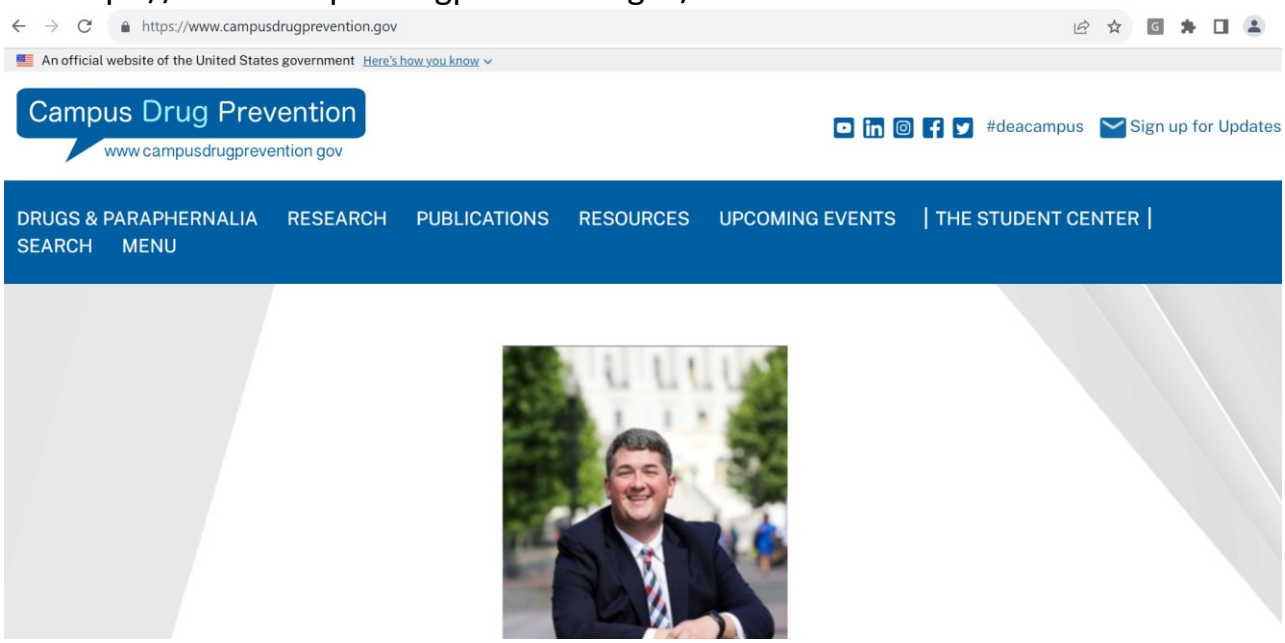
109



www.collegedrinkingprevention.gov/CollegeAIM

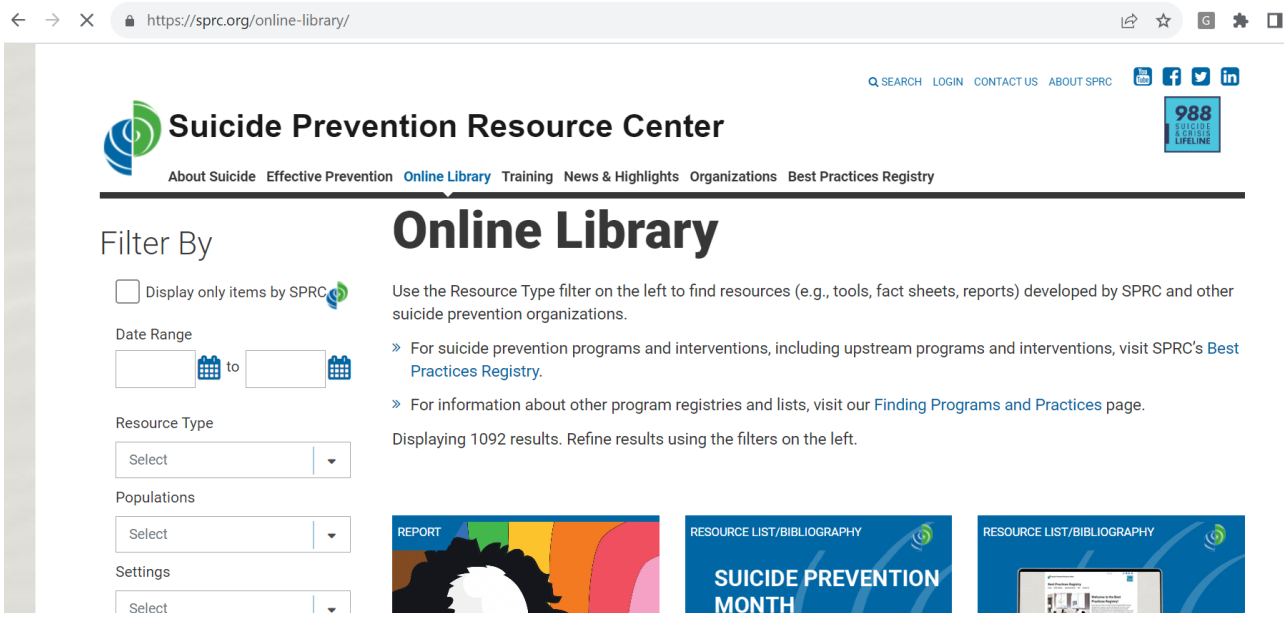
110

https://www.campusdrugprevention.gov/



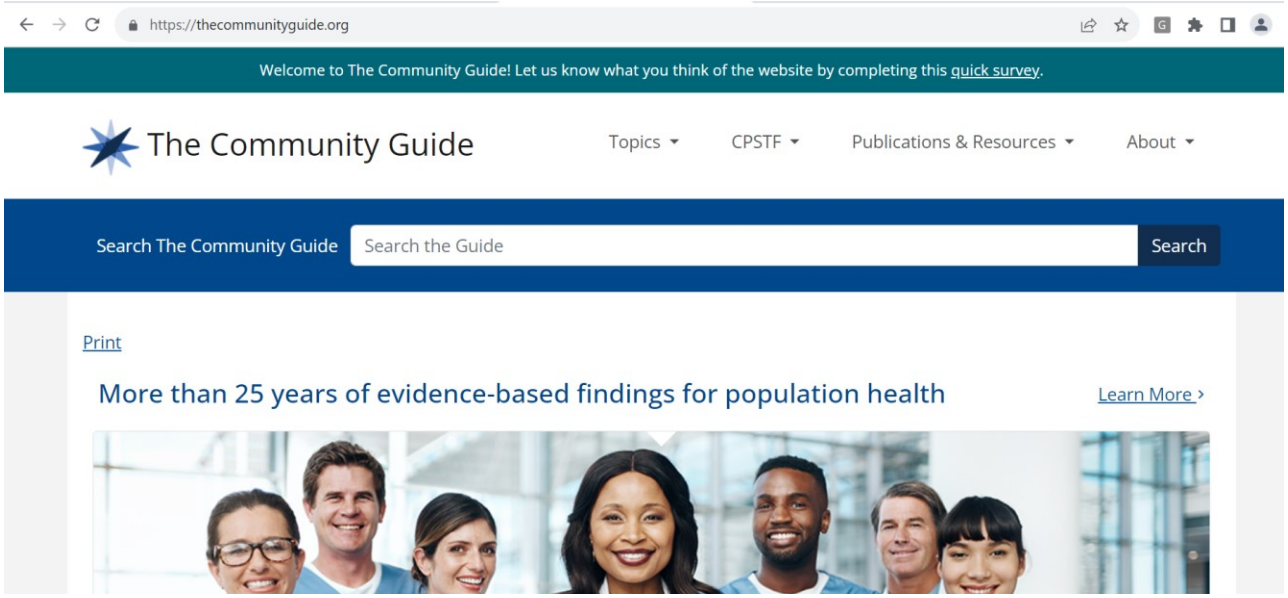
111

Suicide Prevention Resource Center Best Practices Registry
http://www.sprc.org/online-library



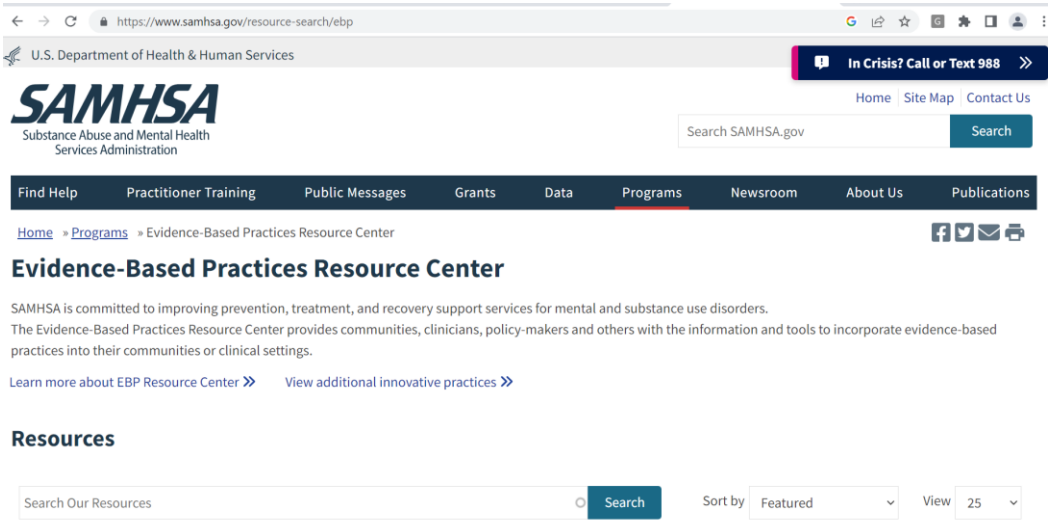
112

Guide to Community Preventive Services
http://www.thecommunityguide.org



113

SAMHSA's Evidence-Based Practices Resource Center
https://www.samhsa.gov/resource-search/ebp



114

Then, implement them with fidelity

115

And when people don't seem on board with prevention?

Tell the story differently.

116

Show how what you do in one domain pays dividends elsewhere.

Transform the narrative to make clear why prevention matters.

117

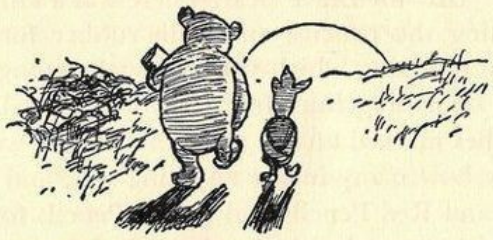
Because sometimes we just need to tell a story in more than one way to get people on board… And you have that ability…

118

"When you wake up in the morning, Pooh," said Piglet at last, "what's the first thing you say to yourself?"

"What's for breakfast?" said Pooh. "What do *you* say, Piglet?"

"I say, I wonder what's going to happen exciting *today*?" said Piglet.



Pooh nodded thoughtfully.

"It's the same thing," he said.

Milne (1926)

Thank you!

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- **Thank you to Britany Wiele, Alyssa O'Hair, Karen Totten, CASAT, and the Pacific Southwest PTTC**

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Follow us on Twitter: https://twitter.com/PS_PTTC

121

Pacific Southwest (HHS Region 9)
PTTC Prevention Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

Thank You!

CASAT
Center for the Application of Substance Abuse Technologies
UNIVERSITY OF NEVADA, RENO

122