April 2020

prime

from Prevention Research Institute

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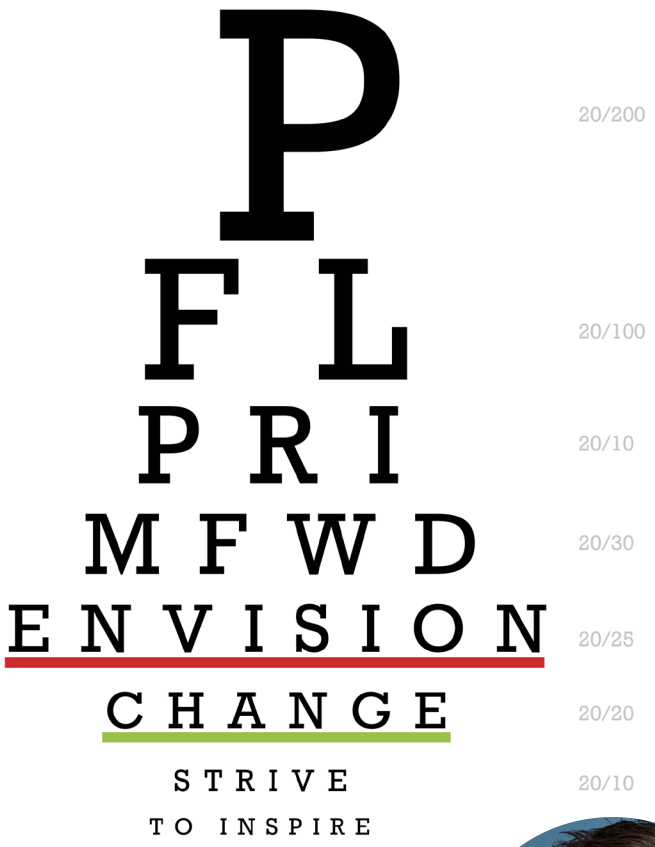
With Clearer Vision, We See New Possibilities

"20/20" has long been synonymous with normal vision. Most people who begin to experience difficulties with their vision are aware of it and seek professional advice. An eye care professional can perform a test and can confirm they aren't seeing things as well as possible.



For some, the lack of clarity in their vision might not be obvious. Perhaps they have experienced a degradation over a long enough period of time it was unnoticeable; they just didn't realize how bad their vision had gotten.

High-risk choices around alcohol and drugs can play a similar trick. Reflecting on the phases in Prime For Life®, we see there are many experiences that can trick us into thinking we're okay even as we might be experiencing problems related to our drinking or use. It can be foggy and hard to see.

There is a story of two friends talking. The one that's doing pretty well in life asks the other, whose struggles never seem to fade, "Why is it you always pick the hard path? Every time, why do you choose the difficult road?". The struggler responds: "Why is it you assume I see any other way?". As people place increasing value on alcohol and drugs in their life, their vision tends to narrow. The possibilities in the periphery disappear and the vision for a brighter future can dim.

At PRI, our mission is to change that. When we look at the science on change, we see that for a person to move from saying, "I don't need to change," to "Well, maybe…," this person must first care about the issue, then must be able to see a different way. They must envision change. Of course, we cannot force anyone to see that change, in much the same way we cannot force them to make the choices we think might be best. What we can do is inspire them. Our mission is to breathe life into the vision of each individual we work with. Our mission is to ignite the imagination and expand the view of what each person sees as possible in their life. Our mission is to inspire.

In Prime For Life, we start off with something each person can connect to that has the power to inspire: The things we care most about. The vision of these things thriving is, indeed, an inspiration for many. The program is designed to push people in this direction, and it only has the power to do so when we instructors breathe life into Prime For Life. We can do this by bringing

Derek Jorden, Partner Relations Mgr

"When we look at the science on change, we see that for a person to move from saying, **"I don't need to change," to "Well, maybe…,"** this person must first care about the issue, then must be able to **see a different way.**

our fullest selves, remembering every time we step into the classroom why we are doing it, and maybe even listening to Michael Jackson's "Man in the Mirror" if we need that extra push. While many of us may benefit from it, we are not only talking about channeling our inner Tony Robbins here to enhance peoples' vision of what is possible in their lives. Our job is a bit like that of a salesperson. Allan Barger quips, "We're in the business of selling a new view of risk and none of us buys from someone we don't like or don't trust." While we don't really sell Prime for Life, it is true we must inspire faith within people for them to see what is possible when we protect our values. To better inspire what is possible when we protect our values, we must first inspire confidence from the people we work with. To better inspire what is possible when we protect our values, we must first inspire confidence from the people we work with. This is a partnership, a collaboration where inclusive and respectful language ("Working With" skills) increase our effectiveness tremendously. "While they don't know us, they have to have some reason to believe we are not there to hurt them, but to help them get what they want," Barger says. What we say and how we say it are equally important to helping people see the potentials and to garnering the trust that we're there to help in achieving them.

With the strange changes we've all experienced this year, 2020 might take on a new meaning unrelated to clear vision. But just as always, each one of us has the power to inspire, to help each other and even ourselves see what is possible when we make choices to protect the things we value.

Ask PRI

answering your questions about everything PRI

with David Rosengren

Q:

My name is Alicia. I am freshly out of the Prime For Life training and am gearing up to complete my certification. However, there is some language that is used in the program that I was hoping I could talk to you about.

Throughout the curriculum you hear, "drug addiction," "addiction". This language is not being used anymore. It has been viewed as being stigmatizing and actually some funding depends upon using the right language in regards to individuals with substance use disorder (SUD). Does PRI plan on updating this language? I appreciate any information you could provide and as a person working with a younger population, I feel this program could truly make a strong impact.

A:

Hi Alicia,

Thank you for raising this concern. It's clear that you care deeply about this issue of stigmatizing language. We do, too.

Like you, we take words very seriously. We considered changing "alcoholism" and "drug addiction" in PFL to "use disorders" a few years ago when we developed Version 9, the current version. Your thoughtful question led us to revisit this issue and have a robust and useful discussion amongst PRI staff. There are four main points we considered.

First, words matter and so we want to be attentive to the language we use and how we use it. We use language intentionally. For example, since 1983, PRI has been referring to "people with alcoholism," rather than to "alcoholics." This usage indicates people are not a condition or a disorder. So, we asked ourselves, are we still using the correct language?

Second, while words do matter, it is ultimately the view that underlies the words that is critical to change. That is, no matter the wording, serious conditions caused by the use of substances will be stigmatized as long as people believe these conditions are caused by being either a weak or bad person. PFL teaches a new view of these conditions as being lifestyle-related health problems, which develop just like the most common forms of heart disease. This understanding de-stigmatizes these conditions. We want to make sure we're targeting this part of the stigma equation.

Third, words need to be meaningful for participants in PFL because of what we ask of them. In particular, we work to surface individuals' beliefs that interfere with their perception of personal risk. People often have strong beliefs about alcoholism and drug addiction, but are uncertain about what "use disorders" are. Our sense is that the public is not yet in tune with the term "use disorders" enough for it to be useful presently. It does not draw out the belief, "It couldn't happen to me."

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From Bad to Worse:
Trends in Alcohol-Related Death Rates

Mark Nason, Research Analyst, PRI

Research indicates a long-standing problem is getting worse.

High-risk alcohol consumption is still a major cause of death in the U.S. and has been becoming more so in recent years.

Over the past several years a lot of media attention has been focused on drug overdoses. This is understandable given both the large number of people dying and the dramatic increase that has occurred. Meanwhile, increases in alcohol-related deaths in the U.S. have been largely flying under the radar until very recently. Two studies published in the past 3 months indicate the rate of alcohol-related deaths has increased significantly in recent years. While the specific data in these two studies varies dramatically due to a major methodological difference, the same key conclusions were reached.

How the two studies were done

Study 1[1] involved tracking the number of alcohol-induced deaths (as indicated on death certificate) and the rates of these fatalities per 100,000 people aged 15 years and older from the year 2000 through the year 2016. The authors also reported this data by age group, gender, and ethnic/racial groups. Alcohol-induced deaths were defined as deaths believed to be 100% due to alcohol, such as alcohol poisoning and alcoholic polyneuropathy. Consequently, Study 1 did not include deaths that were likely alcohol-related but were not 100% known to be caused by alcohol consumption, such as alcohol-related cancers and deaths from injuries in crashes where one or more drivers had BACs of at least 0.08%.

The methodology of Study 2[2] was very similar but had one major difference. As with Study 1, cause of fatality was based on death certificates. However, the authors of Study 2 tracked a broader range of alcohol-related deaths, including deaths from crashes involving at least one alcohol-impaired driver and alcohol-related cancers. The number of deaths and the rates of these fatalities per 100,000 people aged 16 years and older were reported for the year 1999 through the year 2017. Mortality data by age group, gender, and ethnic/racial groups was also reported in Study 2.

Results

As shown in the graphic (next page), both studies clearly indicate a large increase in not only the number of deaths due to alcohol consumption, but also in the fatality rate per 100,000 U.S. residents. Again, since Study 2 included a wider range of alcohol-related deaths, the numbers are much higher than those reported in Study 1. Other key findings include:

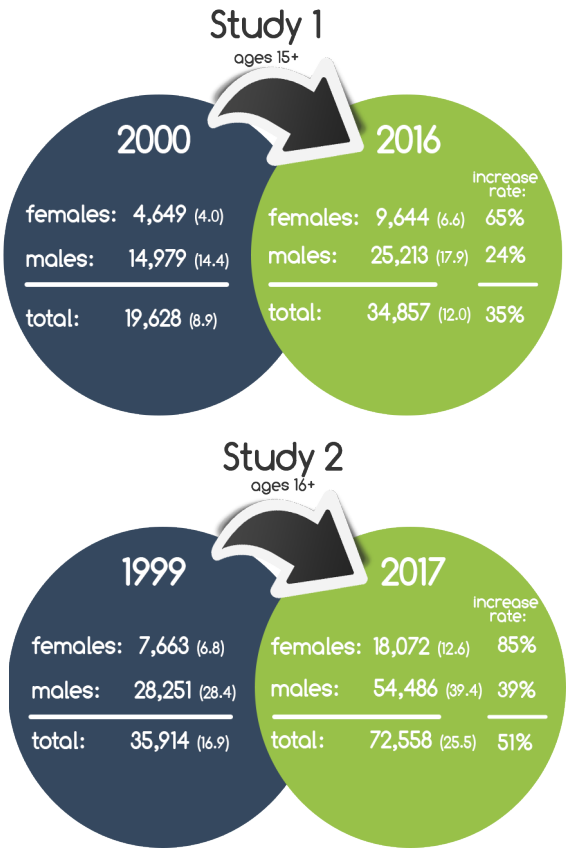
- While males were much more likely to die from alcohol-related causes, women had a larger increase in alcohol-related fatalities over the time periods covered in the studies. In both studies, the biggest increases in the rates of alcohol-related fatalities occurred in the later years of the study periods.

...both studies clearly indicate a large increase in not only the number of deaths due to alcohol consumption, but also in the fatality rate per 100,000 U.S. residents.

- In the last year of both studies, the highest rates of alcohol-related fatalities among males and females were among ages 55-64. Data in Study 2 shows alcohol-related fatality rates increased over the years for all age groups except for those aged 16-20 years and persons aged 75 years or older.

- Among ethnic/racial groups, non-Hispanic (NH) American Indians or Alaska Natives (AIAN) had the highest rates of death from alcohol-related causes in both studies. [Note: in Study 1, the AIAN group only included persons living within Indian Health Service Purchased and Referred Care Service Delivery Area counties. In Study 2 there was no indication that the AIAN categorization was limited to persons living in specific locations. In Study 1, among males, those classified as Latino had the second highest rate, followed closely by NH Whites; among females, the second highest rate was among NH Whites, followed by Latinas and NH Blacks. In Study 2, among males, those categorized as NH Whites had the second highest rate, followed closely by persons classified as Hispanics and NH Blacks; among females, the second highest rate was among NH Whites, followed by NH Blacks.

Graphic: Number of alcohol-related deaths, age-adjusted rates per 100,000 residents (in parentheses), and increase in the rate of alcohol-related deaths over the time period studied.



How do the results compare to other studies?

Numbers of alcohol-related deaths very similar to those in Study 2 were reported by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). Using alcohol-attributable fractions (AAFs), the WHO estimated that 79,345 people in the U.S. died from alcohol-related causes in 2016 and the CDC estimated that from 2006 through 2010 the U. S. averaged 88,129 deaths from alcohol each year.[3,4] AAFs are based on calculations which determine the proportion of a cause of death that is likely due to drinking alcohol. For example, an AAF of 1 means 100% of that cause of death is due to alcohol consumption. As indicated earlier, all causes of death in Study 1 had an AAF of 1. In contrast, in recent years the AAF for fatalities in crashes is about 0.25, meaning about 25% of all fatalities in crashes are likely due to alcohol impairment (at least one driver had a BAC of 0.08% or higher).

Limitations

Both Study 1 and Study 2 have significant limitations, most of which result in underestimates of the probable true number of deaths due to alcohol consumption. By focusing strictly on alcohol-induced deaths, Study 1 dramatically underreports the number and rate of deaths due to alcohol consumption. This data is mainly helpful in understanding changes over the years in fatality rates from causes of death that are likely due to alcohol 100% of the time. Since the methodology is consistent over the time period studied, the data likely portrays these trends in alcohol-induced deaths reasonably accurately. Nonetheless, it is possible that during the time period studied there were changes in the willingness (affected by perceived stigma) and the ability of those recording the deaths to indicate the fatality was due to alcohol consumption. For example, one of the major causes of alcohol-induced mortality was alcoholic liver disease. According to the American Liver Foundation, the main cause for cirrhosis of the liver is hepatitis C, followed by alcohol consumption.[5] Many people who test positive for hepatitis C never develop liver disease, and research indicates that people with hepatitis C can develop cirrhosis on less drinking than people

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From Bad to Worse continued from page 4

without hepatitis C.[6] So, in some cases it could be difficult to know the degree to which alcohol contributed to death from liver disease. It is also possible that the way in which this is determined has changed over time. This potential, occasional difficulty in determining alcohol-related liver disease also applies to Study 2.

An additional major limitation noted by the authors of Study 2 is that there are some alcohol-related causes of death which are seldom represented on death certificates. This leads to a substantial underreporting of deaths due to alcohol consumption. They gave two examples—fatalities due to alcohol-related crashes and to alcohol-related falls among older people. The authors cite the CDC's estimate that of the 31,190 fatalities from falls among people aged 65 years and older in 2017, 32% likely involved alcohol. Yet only 1.8% of death certificates for persons in this age group who died from falls indicated alcohol was involved. So, out of the nearly 10,000 fatalities from falls that were estimated to be alcohol related, only 566 were listed as such on death certificates in 2017. Similarly, 2017 data from the National Highway Traffic Safety Administration indicates 10,874 fatalities occurred in crashes where at least one driver had a BAC of at least 0.08%. In contrast, the data presented in Study 2 indicates only 1238 death certificates issued in 2017 signified the fatality was due to injuries from alcohol-related crashes. Thus, only 11.4% of fatalities from alcohol-impaired crashes were designated as alcohol related on death certificates. While some of these 10,874 deaths could have been due to poor driving on the part of a sober driver in these crashes (i.e., not all alcohol-impaired drivers caused the crash they were in), this certainly would not have been the case in over 88% of these crashes. In total about 19,000 fatalities occurred from these two probable alcohol-related causes that were not indicated as such on death certificates in 2017. Consequently, a conservative estimate is that an additional 14,000 people likely died due to alcohol from just these two causes in 2017.

It is also possible that the number of alcohol-related deaths could have been overestimated for some causes of death in Study 2. In particular, the authors report that 10,596 death certificates in 2017 indicated alcohol was a major contributing factor in deaths due to drug overdose. They cite evidence that the combination of alcohol and other drugs increases the likelihood of fatality over that of the same dose of the drug without alcohol. In addition, it is possible that alcohol intoxication could have led to accidental drug overdose or to suicide via drug overdose. Nonetheless, it is not clear how many of these 10,596 deaths might have occurred even without alcohol. Also, as indicated earlier, there is some complexity in determining the role of alcohol in deaths due to liver disease. While it is much more likely the role of alcohol is underreported in liver disease, there might be cases in which alcohol was mistakenly listed as a contributing factor.

Conclusions

Given the methodology within each study was consistent for the time periods covered, it is evident that the number and rate of alcohol-related fatalities have increased substantially in recent years. The specific numbers are less well documented and prone to significant error. Considering all the potential sources of error, it is likely that the number and rate of fatalities due to alcohol consumption is greatly underestimated in both studies, particularly in Study 1. High-risk alcohol consumption is still a major cause of death in the U.S. and has been becoming more so in recent years.

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A Year of Wonders?

In her 2002 book, *Year of Wonders*, Geraldine Brooks tells the story of the black (bubonic) plague as it rampaged through England and the rest of Europe.

Inspired by the true story of self-quarantine in the village of Eyam, the tale describes catastrophe and survival, resilience and growth that transforms this dark, dark time into a Year of Wonders. A work of historical fiction, it seems relevant to now.

We are in a dark time. At this writing, epidemiologists are projecting 100,000 to 240,000 COVID-19-related deaths of our fellow citizens as a best-case scenario. The peak of infection has not yet hit. We've observed price gauging and hoarding of scarce supplies. Our political leadership has been disjointed between different systems. People violate stay at home orders. The economy is in trouble and millions are financially at risk. It is easy to see selfishness and feel anxious, alone, and fearful.

And yet, it could also be the start of our year of wonders. We've done something that has never been done before. As a nation, we've chosen to remain home to protect ourselves and protect our most vulnerable. We've also witnessed remarkable things. There is incredible heroism amongst our first responders, police, fire and health care workers as they've placed their lives on the line, literally, to protect us.

Schools are transforming how they teach. Places of worship are finding ways to feed their flocks from a distance. Food pantries are figuring out new ways to feed the hungry. Our leadership set aside bitter divides and found common ground to meet the needs of Americans. Together, we're figuring out ways to have community while maintaining our physical distance and perhaps bridging some of our divides.

In Seattle, where I reside, we had our first hint of good news that social distancing is working.

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David Rosengren, President, PRI

"Together, we're figuring out ways to have community while maintaining our physical distance and perhaps bridging some of our divides.

A Year of Wonders continued from page 6

Hospital admissions dropped this last week in King County. These are wonders.

At PRI, you've been hearing a lot about what we're doing – electronic workbooks, tip sheets on how to provide Prime For Life and Prime Solutions remotely, webinars to help learn how to modify these programs to do them using technology – through Jamee Smith's work on social media, the website, and emails. We expect to begin rolling out web-based learning opportunities in the near future for those who need CE credit and recertification, as well as for folks who want Prime For Life training. We've reached out to the leadership in all the systems to help make tele-delivery of these programs a possibility. The work of PRI staff has been remarkable in a few short weeks, and for me, these are wonders, too. We know this is a time of hardship and our aim is to help. We also have faith this could be a year of wonders, if we'll only look for them and then work to grow into new possibilities. As we do that together, let us know how we can help.

"We know this is a time of hardship and our aim is to help."

RE: Prime For Life Training Experience

Real instructors sharing real thoughts

"First, I want to thank everyone at Prevention Research Institute for your dedication to the field of addiction and recovery. The work you do makes my job easier as you provide accurate data and research in order to help clients understand the power of low risk and high risk choices relative to substance use.

I recently attended my fourth training with Prevention Research Institute. Derek and Dave were our trainers. I love the enthusiasm they have for the subject and for training! I want to applaud them for being able to stay focused and engaging in the midst of COVID-19 coming down on our nation. People were scared (I know I was and still am) regarding the uncertainty of our country, our world. Thank you for staying the course.

My Director of Operations, Florenda, indicated that during her new trainee orientation, Derek approached her and said "What a fun and great boss Chuck is." That demonstrates how personable the trainers are at Prevention Research Institute. I feel every year as if I am attending a family reunion.

Prime For Life and Prevention Research Institute helped me with my sobriety. They help my client work and my ongoing dedication to personal and professional enhancement. I look forward to many years to come!!!

Charles L Diviney III
PhD, LCMHC, NCC, CCMHC
Doctor of Counseling Studies
Board Certified Counselor

"

Continue 2020 Our Training

Michelle Stephen Seigel
Director of Training, PRI

Ever wonder what guides the new session topics you experience each year? We review learner feedback from every Continuing Education Training (CET), and your ideas promote our focus for the following year.

We have been receiving a new form of feedback and focus related to our work, coding and coaching new instructors in the recently revised certification process. Other ideas come from our experiences in training environments – particularly through learning of the topics or research trainees may find difficult to retain or communicate.

In December 2019, PRI Training and Research team members reviewed learner feedback and began drafting new session topics for CET 2020. A sub-group met in January to finalize and test the topics together and refine the session images for David, Derek, Michelle and Stephanie to test drive in our first CET of the year – Columbia, South Carolina. We learned a few things there, got some actionable feedback from instructors, and made a few changes as a result. We are eager for you to experience them in your system soon!

A few of the new session topics featured at a CET you attend in 2020 may include the following.

Back to Basics
This session offers a review of the basics of Prime For Life® using an interactive learning tool called **Kahoot!** There are so many moving parts involved in sharing Prime For Life (PFL), and for many of us, it has been a long time since our New Instructor Training. We might also be using a version different than the one we originally learned. Research shows that drift in using an evidence-based program can undermine our effectiveness.

This interactive session helps participants and trainers know what areas require review and what areas are well understood. Using this fun technology on their cell phones, participants receive private, personalized feedback, while trainers receive information on the group as a whole. Trainers also provide targeted information specific to the group's training needs. Here's what one instructor shared about this session:

"Loved the computerized test process. It helped me assess my knowledge of the information we present in PFL. It was presented in a very enjoyable fashion; yet, it helped me to make new and fresh distinctions in what I knew and what I should brush up on!"

-Utah Instructor

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What We Have Learned from Coding New Instructors
Program fidelity is an integral step when implementing evidence-based programs. This session offers an interactive look at what our PFL Coaching Team has learned in our first year of coaching new instructors with the Moving ForWarD Quality Assurance Tool as part of PFL certification. There will be opportunities to assess high- and low-fidelity Prime For Life implementation, explore what criteria places the samples in these categories, and to consider our own Prime For Life practices in relation to these markers.

Teach and Talk
Through coding new instructors, our coaches have identified a few areas of content which are consistently challenging to present. This session will review effective delivery methods and provide an opportunity for instructors to observe a PRI Trainer "teach" a section, followed by a debriefing time to "talk" through key points.

"I loved the 'show me' where an instructor took two different sections (one each day) and demonstrated how to present!"

—SC Instructor

Where Science Meets Story: The Dramatic Arc of Prime For Life
PRI encourages instructors to use the PFL program images as guides to "tell the Prime For Life story." Since the beginning we've told stories; around campfires, in our homes, at our dinner tables. We while away the hours and pass on important ideas. In this session, we'll explore how Prime For Life fits that mold – as a story specially designed to shift the beliefs, attitudes, and behaviors of the people who experience it. We'll investigate how it lines up with the dramatic structure mapped out by writers of old and look at brain research that explains why that structure so potently plays on the strings of our soul. Structure alone, however, does not a good story make, so we'll examine other elements of effective storytelling as well, and how we might apply these to our own delivery of Prime For Life.

THC in Prime For Life
You have asked for more research sessions, so here's a new one on THC! Questions about marijuana continue to arise for instructors with its steady progression towards legalization for recreational use in the USA. This session highlights and reinforces the elements currently in Prime For Life addressing THC use, as well as introducing instructors to some of the new information recently added to Prime For Life 420. This interactive research session uses Kahoot!

"I came back from the continuing education training telling my coworkers and my Executive Director about the benefits of the training. I do not see how you all could have performed any better, even if you were being recorded and evaluated by your immediate supervisors! Keep up the Great Work!"

–SC Instructor

Making Questions Productive
Asking questions is a predictable part of human behavior — we are curious! Participants will learn to recognize several different types of questions used in PFL to engage clients. Attendees will also discover or rediscover how to identify and respond to indications of client change talk, observing how small changes in practice can enhance results, and how to respond more effectively in the context of their work. Don't worry, it's not another MI training — we heard you loud and clear on that one!

There will be Guest Speakers and a few other sessions featured at several events in 2020, and some variety within the agendas in some areas. Check https://www.primeforlife.org/Event to review full agendas and register for a CET near you!

Our Training Team is looking forward to seeing you in 2020! If you have ideas for other topics in 2021, please share your feedback with michelle.stephen@primeforlife.org.

"It was one of the best recertifications…Dave and Derek work well together. I LOVED the section on "Grit," and working purposefully to improve our presentations. Weirdly, I'd just watched the hockey movie, "Miracle," about the 1980 USA team that won the gold medal. Their coach said "talent won't win games," and "the legs feed the wolf," meaning hard work matters more.

- Utah Instructor

Marijuana aggression & violence

Alan Barger, Research Analyst, PRI

“The relationships between cannabis use, cannabis dependence, and different forms of violence are complex because there are multiple social, psychological, and biological factors at play with each.

Alcohol or drug use, criminal behavior, and violence are intertwined behaviors with significant public health implications and potential for serious negative outcomes for individuals and those around them.[16] However, there is conflicting information about marijuana and violence. Is there a link between the two?

There is a persistent belief in the public, based on history, that marijuana use is not linked to violence. In 1926, a New Orleans newspaper published a story called The Menace of Marijuana which caused a sensation and led the Federal Bureau of Narcotics to pass the Marijuana Tax Act effectively banning marijuana from purchase or consumption. And about 10 years after this story’s publication, the film “Reefer Madness” – a serious but misguided prevention effort suggesting the use of marijuana would transform users into homicidal maniacs – was released. The film was originally titled “Tell Your Children” and intended to be educational for parents to help them inform their children on the dangers of marijuana. However, the producer of the film bought the rights back, re-edited it into a lurid “sexploitation” movie and it played in theaters for several years up into the 1950s. It was rediscovered in the 1970s and became an unintentional satire of marijuana risks.[17] The backlash against its sensationalized message created a cultural impression – lingering to this day – that any link between marijuana and violence is an invalid scare tactic.

I recount this history because I personally accepted that cultural perspective and suspect I am not alone, yet none of these actions for or against marijuana claimed any empirical basis to support their credibility. In their literature review on marijuana and violence, Moore and Stuart[28] note that several studies from the 1970s and 80s looked only at brief, acute THC intoxication and reported that marijuana use not only failed to induce violence, but there was an inverse relationship in which those under the influence of THC were less likely to respond aggressively. Hoaken & Stewart[17] also report earlier studies finding less hostility, whether verbal or physical, in group settings when people were under the influence of marijuana. Moreover, acute effects of THC seem to be the opposite of violent behavior – relaxation and detachment from one’s surroundings. Due to that, I never investigated the research literature further about a cannabis-violence connection and, at the beginning of this review, I did not personally expect to find a significant relationship between marijuana, aggression, or perpetration of violence once other psychosocial variables were considered.

The relationships between cannabis use, cannabis dependence, and different forms of violence are complex because there are multiple social, psychological, and

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Violence
Distal & Proximal Factors

Distal Factors

- Childhood Aggression
- Childhood Abuse
- Temperament
- Family History SUD
- Heavy Alcohol Use
- Past or Current Drug Use
- Gender Role Expectations
- Aggression Norms
- Peer Influence
- Witness Parental Violence
- Poor Social Skills
- Relationship Discord
- Psychopathology (ASPD)

Proximal Factors

- Acute Drug Effects/Influences
- Altered Information Processing
- Threat/Provocation
- Impulsivity
- Emotional Arousal
- Relationship Types (Partner or Stranger)
- Verbal Behaviors and Aggression During Intoxication
- Setting of the Encounter

Moore & Stuart 2005 [26]

biological factors at play with each. This report is a distillation of multiple studies published over a nearly 30-year period (1992 – 2020) on the relationship between marijuana and violent behavior. Some studies are cross-sectional while others are prospective, longitudinal, cohort studies reporting findings from multiple industrialized nations. The research is global, covering cultures as distinct as the United States, Italy, Norway, and New Zealand. They explore marijuana use and violence in general populations, ethnic and racial minorities, those in substance abuse treatment, and those in mental health treatment. In addition to a variety of age, ethnic identity, socioeconomic levels, substance use disorder (SUD) and mental health (MH) treatment statuses, these studies also explore various types of violence including interpersonal violence, intimate partner violence, clastic (indirect) aggression, and self-harm.

(A note on terminology: This review generally refers to "marijuana" or "cannabis" – using those two interchangeably – rather than "THC" because few studies distinguish between various cannabinoids in marijuana. While THC – the only psychomimetic substance in marijuana – is probably linked to a majority of the risk for violence, especially in links to cannabis withdrawal, there is no way to explore the roles played by other cannabinoids – alone or in concert – in this issue. A search in Google Scholar using "THC + violence," "THC + aggression," "CBD + violence," or "CBD + aggression" found no articles distinguishing these compounds. As such, it makes sense to refer to the whole plant rather than to specific cannabinoids.)

Marijuana Use & Violence

That marijuana use is associated with increased aggression and/or violence has been a matter for significant debate in the research literature and as noted, earlier research found no association.[17] More recent studies do find a link between cannabis use and greater aggression or violence compared to non-users.

While the link exists, this raises the question of why such a persistent association is present. What is the nature of the link and is it causal? Research suggests there are multiple reasons, and some are correlative (two things existing at the same time, which does not mean one caused the other) while other factors could be causal, with marijuana use leading to violence or violence leading to more marijuana use (self-medication theory). Violence alone is related to interactions among a variety of distal and proximal factors (see Sidebar: Violence – Distal & Proximal Factors). The distal factors can create a personal context for an individual across multiple social settings where more proximal factors increase the risk of violence. Given these many factors at work, Moore & Stuart state, "Thus, we contend that marijuana use is neither necessary nor sufficient in predicting violent behavior, but rather acute marijuana intoxication may alter psychological, cognitive, physiological, and interpersonal variables that increase the likelihood of violence in social contexts."[28] While they note acute intoxication, this review will explore both acute and post-acute marijuana-related factors that could increase the risk of violence.

Keep in mind that violence virtually always has multiple factors involved when it happens, and those factors vary from person to person. An example of this is that marijuana use is more connected to violence in specific environments, one of those being drug dealing. Friedman et al. (2001),[14] in a sample of inner-city African American men and women who used drugs, found cocaine and cannabis were the drugs most strongly associated with the two most serious levels

Keep in mind that violence virtually always has multiple factors involved when it happens, and those factors vary from person to person.

of violence – attempted homicide/reckless endangerment and weapons use. These associations seem most connected to drug sales/trafficking and were stronger than violence associated with alcohol. The researchers are careful to note their study cohort is a unique social group and does not represent behavior in a general population sample or even a population of inner-city African Americans, but rather of those involved in inner city drug use, where cannabis use is common, and also dealing in the illicit drug trade.

This is supported by findings from Aresneault et al.,[4] who found that 83.3% of those with a cannabis use disorder (CUD) in their youth/young adult cohort were involved in selling drugs compared to only 7.4% of non-dependent users. They note that, in an illegal economy with no means to appeal to any legal authority, intimidation and violence can become a default means of coping with disputes when deals go awry, and those involved become accustomed to using psychological aggression or physical violence as a means of settling disputes. At least in these contexts, the illegal status of marijuana may play more of a role in violent outcomes than the drug itself. That, however, is not the whole story. To explore these issues further we will consider some age-related and psychological differences that create different links between marijuana use to violence.

Adolescent Marijuana Use & Violence

Arseneault et al.[4] explored the link between violence and certain mental health disorders in the Dunedin Birth Cohort – a study group of about 1,000 individuals comprised of all those born in the city of Dunedin, New Zealand, between April 1, 1972, and March 31, 1973. They were followed by researchers for several decades and numerous published studies have reported on their life outcomes. This study explored the role of alcohol use disorder (AUD), cannabis use disorder (CUD), and schizophrenia spectrum disorder (SSD) in relationship to violence. They found all three conditions linked to increased rates of both violent criminal offending as reported in public records and self-reported incidents of aggressive or violent behavior.

They hypothesize three potential mechanisms behind these behaviors: 1) substance use in the hours prior to violent offending, 2) psychosis/paranoia or a specific personality type leading an individual to perceive excessive threat in their surroundings, or 3) a developmental history of conduct disorders. The first suggests the mechanism behind violence is a level of intoxication leading to disinhibited and/or more impulsive behavior. The second suggests a mechanism of heightened subjective impressions of external threats that suppresses self-control and promotes preemptive attacks. The third suggests a mechanism where aggression and victimization is used in the home by individuals at a young age as a means of obtaining what is desired and expands into other social settings as the person ages. The person learns to fight, bully, or use other means of intimidation to achieve their goals in relationship to others.

In this study all three conditions were each uniquely and robustly associated with both court convictions and self-reported violent offending. This association persisted significantly after controlling for demographic factors and all other co-occurring mental health disorders.

AUD = OR 3.4 (95% CI, 2.0 – 5.9)

CUD = OR 5.4 (95% CI, 3.9 – 9.2)

SSD = OR 4.6 (95% CI, 2.2 – 9.7)

Having any two of these conditions doubled the odds of violent offending:

AUD + SSD = OR 8.3 (95% CI, 3.2 – 21.5)

AUD + CUD = OR 11.7 (95% CI, 5.9 – 23.4)

CUD + SSD = OR 18.4 (95% CI, 7.5 -45.3)

Percent of violent offending uniquely attributable to a disorder:

11.3% of violent offending uniquely attributable to AUD

28.2% of violent offending uniquely attributable to CUD

9.6% of violent offending uniquely attributable to SSD

After controlling for the three variables noted above – substance use before violence, excessive perceived risk in the environment, and conduct disorder – the authors state that virtually all association between substance dependence and violence disappeared. Yet that is not exactly what their own data suggests. While the risk for alcohol use disorder became non-significant (OR 1.3, CI 0.6 – 2.9) after controlling for those factors, the risk for violence among those with cannabis use disorder was only reduced from odds of 6.8 (unadjusted odds) to 2.3 (CI = 1.1 – 4.6). Thus, while AUD was no longer significant after adjusting for variables, CUD remained at more than double the odds for violence. Yet, it is possible alcohol continued to play a role in those with CUD but not AUD.

This is supported in a Norwegian cohort study where Hyggen and Hammer[18] found cannabis-using adolescents reported consuming more alcohol than non-users in both their adolescent and young adult years. Alcohol-related problems diminished as the cohort aged due to "maturing out" via assumption of adult roles and responsibilities such as marriage and parenting, but cannabis users were less

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likely to assume adult roles and had smaller reductions in alcohol consumption. Thus, fights or other issues related to alcohol may persist longer or be more frequent in those using cannabis and continuing to consume higher levels of alcohol. This might highlight yet another pathway from cannabis use to violence that is more associational than causal, although it begs the question of why cannabis users do not "mature out" as do many heavy episodic alcohol drinkers. The researchers note this may be due to affiliation in social groups where intoxication is more expected and normal than groups not using cannabis.

A different New Zealand longitudinal birth cohort, the Christchurch Health and Development Study, involved about 1,000 participants in exploring the role of ethnic identity—Maori vs. non-Maori. Marie et al[26] found cannabis use and negative life outcomes were more common in the Maori culture, but also found that after controlling for cannabis use between the ages of 15 and 21 the odds of self-reported property/violent criminal offending fell between the ages of 18 and 21 from 4.69 to 2.64 and more resembled non-Maori outcomes. The odds for violence were reduced when cannabis use was controlled regardless of ethnic identity. Cannabis use in this cohort was also associated with leaving school without graduating and longer periods (more than 6 months) of unemployment. This supports the finding noted in the Norwegian cohort that those using cannabis were less likely to assume adult roles.

In a 2006 Dutch study of secondary school students, Monshouer et al.[27] found that cannabis use was strongly associated with aggressive and delinquent behavior. This would support viewing cannabis use as being part of a constellation of behaviors found in adolescents with conduct disorder – a condition also associated with more aggression and violence. This was particularly true for those who started their cannabis use at age 15 or younger. While Dutch society is perceived as being tolerant of marijuana use, this does not apply to cannabis use by adolescents. Both parents and teachers disapprove of cannabis use at this age, with 95% of students reporting their parents forbade or strongly disapproved of their using cannabis. Thus, use by students, especially in the younger adolescent years, would likely be linked to conduct disorder or other socially aberrant behavior. Moreover, the associations were only found in those using cannabis recently (past year use) and were stronger with more frequent use. Conversely, among those who had discontinued cannabis use, there was no association between their cannabis use and delinquent behavior.

Norstrom & Rossow (2014)[33] undertook a study specifically designed to rule out unobserved confounders between marijuana and violence and explore whether marijuana played a causal role in violent episodes. Using data from the 2nd and 3rd waves of the Young in Norway Longitudinal Study, they included in their evaluation of marijuana use and violence data on age, sex, impulsivity, heavy episodic alcohol use, and non-normative peers. The definition of violence included a physical fight, without or with a weapon, with a rating scale for frequency of fighting. As the group aged, overall violence decreased – a well-known, age-related effect – while overall cannabis use increased. Thus, any association between the two would have to account for these age-related changes in the cohort. The final multivariate outcome controlling for multiple factors showed that a 10% increase in cannabis use was causally linked to a 0.4% increase in violence. This is a small but significant effect and the authors reinforce that their data with controls for confounders indicate a causal role for marijuana in the increased violence.

In a literature review, Liu & Petras (2016)[24] note a strong association between cannabis use and violence in adolescents, but the causal direction and the reasons for the association remain inconclusive, with multiple findings in all directions. That is, cannabis use may contribute to increased violence, violence may contribute to increased use – especially in female relational violence – and cannabis use as a means of coping may reduce violence in some groups.

Most of the evidence suggests that much, but not all, of the association between cannabis use and adolescent violence is non-causal. That is, both violence and increased cannabis use appear to arise from an underlying condition of conduct disorder, an association with high-risk alcohol use, or a personality type prone to view excessive risk around them. In addition, among those who develop a CUD, they are more likely to be involved in drug deal-

Out of seven categories of drugs explored – alcohol not included – only cannabis and depressants had a significant positive relationship with intimate partner violence perpetration.

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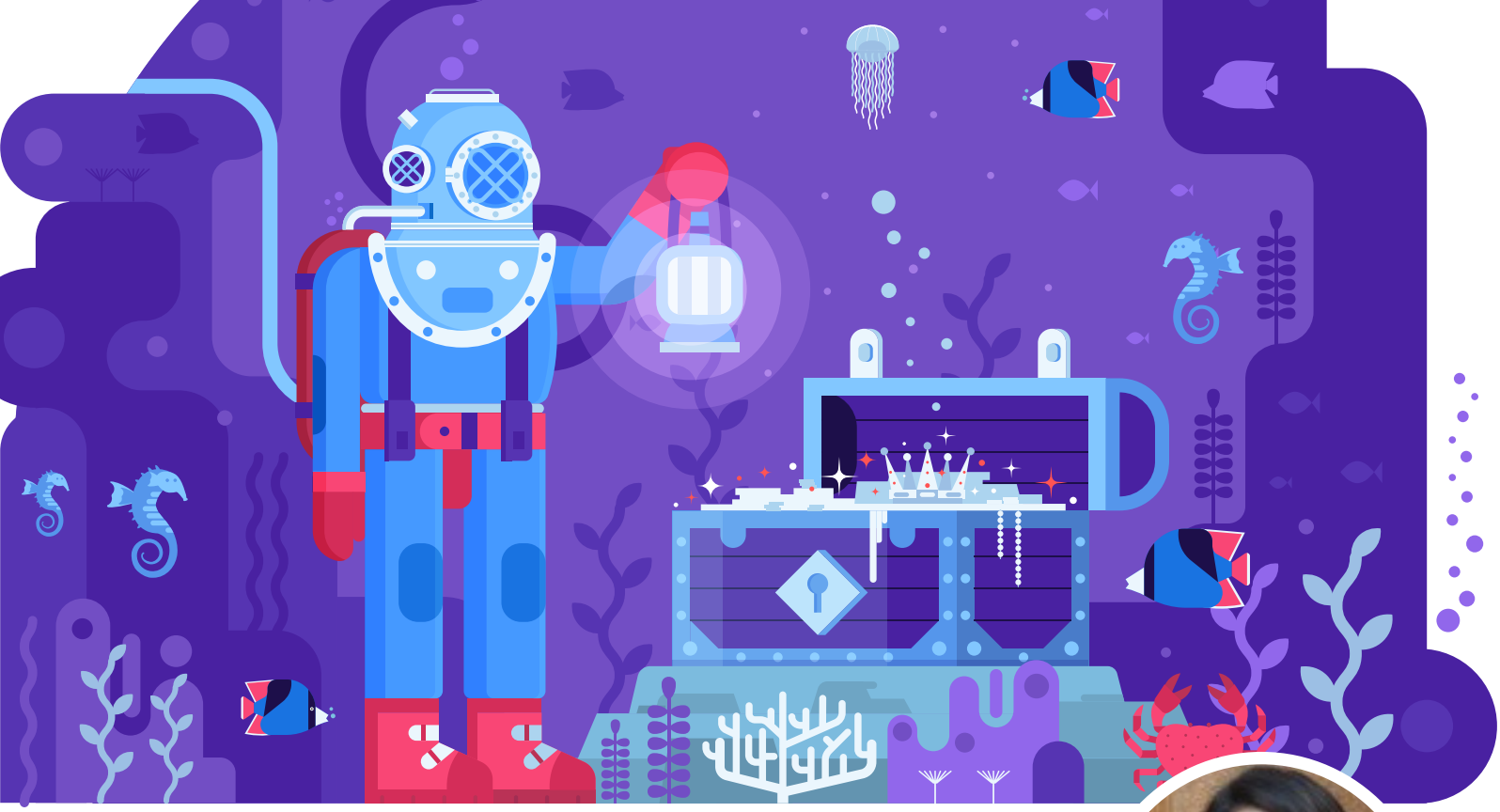

A Deeper Dive

PRI Program Evaluations

In the Fall 2019 Prime newsletter, we reviewed the kinds of evaluation done at Prevention Research Institute (PRI): Assessing the acquisition of and/or changes in knowledge, program evaluation, and more complex research that generalizes beyond the study population. This article will focus on one of these types, program evaluation.

PRI has historically engaged most often in program evaluation. It is this information that feeds into the State Reports, which we distribute periodically to the state systems that use Prime For Life® (PFL). To refresh your memory, this process typically involves PRI soliciting help from instructors to gather data from PFL participants. Previously, these were convenience samples where we used groups who volunteered. We then analyzed the data by each state, rigorously using the same methods we would use in traditional research evaluations.

Despite the rigor, there are some challenges created by this approach to finding participants – our sampling strategy. First, people willing to volunteer to collect data may differ significantly from people who do not volunteer. For example, they might be more confident in their skills. Research in other areas suggests this can lead to results that are skewed. Similarly, if we oversample from particular agencies these groups may also unnecessarily influence the results. While the data was consistently positive in these early PFL evaluations, it was also possible that these issues could be contributing to the findings observed. Researchers refer to these things as "threats to internal validity" - a way of saying we think the results are due to one thing, but they might be due to another.

Over the last few years, we have moved to a system that involves a more representative sample. That is, we want to control for these potential threats to validity. But there

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Rita Dykstra, Research Director, PRI

"Over the last few years, we have moved to a system that involves a more representative sample. That is, we want to control for these potential threats to validity.

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is another challenge here. We want the agencies providing data to be doing PFL frequently enough to be practiced at it. If PFL is only happening a time or two a year, then proficiency may suffer. Lack of proficiency is another threat to our being able to draw the right conclusion. Regular client flow also permits completion of the data collection in a timely way, which protects from another threat: That things change over time and those changes (not PFL) can affect the results. So, in 2017, when the most recent round of state data collection was done, we used a balanced strategy to try to control as many of these threats as we could and verify our results were because of PFL and not any other factors.

In order to meet these criteria, we first contacted agencies who ordered a minimum of 50 PFL workbooks between December 2016 and February 2017. We had a goal of recruiting approximately thirteen agencies with 200 end users in each state. We included that many participants to obtain 150 completed pre- and post-evaluations. In states where there were more than enough agencies to meet the target enrollment, we selected and evaluated a random sample of participating agencies. Where there were fewer agencies than needed to meet the target enrollment, we included agencies that were just below the target workbook sales in our sampling procedures. Data recruitment and collection lasted from March to November 2017. In all, we collected data from 79 agencies in eleven states - Georgia, Indiana, Iowa, Kentucky, Montana, New Hampshire, North Carolina, North Dakota, South Carolina, Tennessee, and Utah. Our total sample included 1,174 people.

Once we have the sample, we want to ask the right questions. In program evaluation, we move beyond whether the participant learned something new to see if these changes in knowledge correspond with shifts in things such as risk perception, readiness to change, problem recognition, and behaviors and behavioral intentions. This is done by carefully selecting questions to assess these areas. For example, we asked a series of specific questions related to knowledge of alcohol and drug risks, tolerance, and the definition of a standard drink. Participants were also asked questions about general risk perception (e.g., how much people in general risk harming themselves by engaging in high-risk alcohol and drug behaviors), personal risk perception (e.g., the extent to which the participant is personally risking important things by engaging in high-risk alcohol and drug behaviors), and risky drinking (how many drinks most people, and the participant, can have before they will cause injuries and be too impaired to drive). Finally, we ask about participants' recognition of personal alcohol and drug problems, level of readiness to change their alcohol or drug use, their alcohol and drug use in the 90 days before going through PFL, and their intentions for alcohol or drug use in the 90 days following PFL.

What did the data reveal about participants in PFL groups? Looking at all participants, the data shows that prior to attending PFL most were engaging in risky alcohol use and about a fifth used marijuana. After going through PFL, participants demonstrated increased knowledge of the effects of tolerance, risk factors for developing a substance use problem, and what constitutes a standard drink. Participants also reported increased risk perception for others and self, and intention to decrease use of alcohol and/or drugs and to not drive while impaired. When looking at participants from each state individually, we found the same to be true.

Overall, these results are consistent with those from past program evaluations and offer additional evidence to support the use of PFL with individuals who have been arrested for impaired driving. I hope an underlying truth has become apparent in reviewing this process: At PRI, we consistently ask ourselves to evaluate critically what we do and how we do it. In this process, the research team's job is not to confirm what we know, but to actively question and challenge it. We use a phrase here to remind ourselves of that: "The data are always friendly." It means even if we're wrong and research shows us something we didn't want to find, we will learn from it. This stance makes us better and allows you to have faith in the program.

Finally, the newest State Reports are being sent out as this goes to press. If you are an instructor in one of the states that participated in this round of evaluations, you should soon receive a personalized report overviewing the impact of PFL in your state (if you have not already). Copies of these reports will be available on the website shortly. We are extremely grateful to all the instructors and participants who make this research possible and for the opportunity to serve you and your communities.

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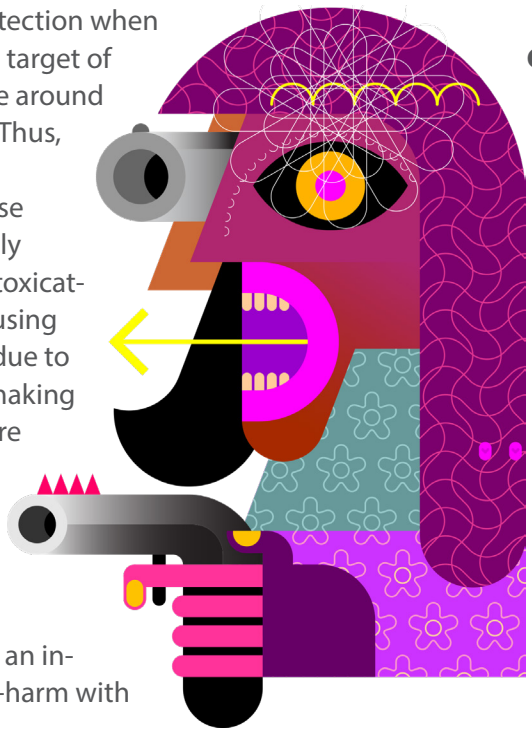
ing which is more associated with violence for social and economic reasons.

However, adolescent cannabis use may play some causal role as it increases paranoia or psychosis symptoms,[3] which are also associated with increased agitation and aggression.[15] It might also be associated with impaired cognitive function or other mental effects making it harder for a person to negotiate relationships. Finally, those who are cannabis dependent are more likely to engage in drug dealing, an environment where violence is increased. These effects, in the presence of more proximal factors predicting violence, may amplify their effects.

Adult Marijuana Use & Violence

In adult populations, marijuana and violence have a more complicated relationship. While some of the social and psychological factors seen in adolescence can continue, other factors come into play. In a general population study in the U.S., Dawson[10] found that, compared to non-users, male cannabis users with no incidents of past year alcohol intoxication were twice as likely to report fighting while under the influence of only marijuana compared to non-users, however the number of male users who did not become intoxicated on alcohol was a small number. Female cannabis users without alcohol intoxication in the previous year had nearly 5x the rate of fighting while using marijuana only, and among cannabis-using women who became intoxicated on more than half their drinking days the risk for fighting was doubled. Dawson found occasions of aggression by women are often associated with retaliation or self-protection when they have been the target of aggression by those around them, often males. Thus, the reduction from fights between those using marijuana only and those being intoxicated on alcohol and using marijuana may be due to alcohol's effect of making a female victim more docile or unable to respond in the face of aggression.



Dawson also found an increased risk for self-harm with higher rates of suicidal ideation and attempts among marijuana-only users. While the higher rate of suicide attempt was no longer significant after controlling for major depressive disorder, it still suggests cannabis use might promote self-harm in those who are depressed. This is an alarming finding given that many young adults today view marijuana as beneficial for treating depression. Budney reports 71-86% of college freshmen and sophomores believe cannabis has therapeutic benefits for depression (Conference Presentation, July 2019, Research Society on Marijuana).

Rajs & Fugelstad (1999),[34] in a review of deaths in Stockholm, found a disproportionately larger number of deaths related to cannabis were violent (93%) compared to other forensically examined deaths in Sweden (51%). Cannabis-related deaths were also more impulsive, more violent, and when a weapon was involved it was whatever was at hand, suggesting less premeditation. The suicides also appeared to be more impulsive and violent. Suicide was also more prevalent among those who had been previously treated for a cannabis toxic psychosis – a psychotic state brought on by cannabis in the person's system and which clears up with abstinence. This is supported by Niveau & Dang[32] in a series of seven case reports where violence and cannabis use coincided. They found violence did not occur during a phase of the marijuana's well-known sedative effects, but during "an exceptional, cannabis-induced confused or psychotic state" associated with unwarranted feelings of anxiety or persecution. They further report that those in cannabis-induced psychotic states are more likely to be violent than those with schizophrenic psychosis.

Cannabis & Intimate Partner Violence

Violence between individuals might occur between those with whom individuals spend the most time. Six studies[7, 9, 26, 28, 31, 37] explored the relationship between cannabis use and intimate partner violence (IPV), with some distinguishing between IPV perpetration and IPV victimization. There is a relationship between marijuana and increased IPV. In cross-sectional data, Moore & Stuart[28] report a strong association between marijuana use and IPV perpetration. In a cohort of 150 men ordered to batterers intervention groups, 25% of the group used cannabis daily and more used weekly. Those who regularly used cannabis, but used alcohol or other drugs less than monthly, agreed they would need to reduce their marijuana use to avoid physical violence with their partners. The rate of daily cannabis use in that group was 7x higher than the national average. In the Christchurch cohort,[26] after controlling for use of cannabis in the

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young adult years, there were small reductions at ages 24-25 from 2.08 to 1.97 for odds of intimate partner violence perpetration, and reductions from 2.61 to 2.48 for odds of intimate partner victimization. While these reductions in violent episodes were small, they were significant and suggest that cannabis use can increase rates of IPV perpetration and victimization.

In a study of drug use and IPV in a college sample of 1,938 undergraduates where committing physical assault was the variable studied, Nabors [31] found a significant relationship between marijuana and IPV. Out of seven categories of drugs explored – alcohol not included – only cannabis and depressants had a significant positive relationship with intimate partner violence perpetration. After controlling for multiple potential confounders such as alcohol consumption, parental education levels, and exposure to interparental violence, cannabis or depressants were the only drugs predictive of physical assault on an intimate partner in the general population of students. In fact, compared to non-users, cannabis users were 35% more likely to physically assault a partner.

Exploring differences by sex, there were some surprises. Interestingly, male students did not show significant relationship between any drug use and IPV after controlling for confounders. The only statistically significant relationship between male college students' substance use and IPV was an inverse relationship, with anabolic steroid users being 65% less likely to use violence against a partner compared to steroid non-users. Since males are the most likely perpetrators of IPV, it may be that drugs of any kind play an overall smaller role in such incidents compared to other factors.

The findings regarding female students were also surprising. The use of depressant drugs was most associated with female students using violence on a partner, with double the risk compared to those not using depressants. There was also an inverse relationship, with females using narcotics being 65% less likely to engage in IPV.

In a study of a midwestern U.S. population of men and women in treatment for various substance use disorders, Chermack et al.[9] reported significantly higher rates of psychological and physical violence compared to a general community population, as well has high levels of injury, both inflicted and received. Depression, binge drinking, use of cannabis, cocaine, and illicit opiates/sedatives were all related to IPV aggression and injury measures. In gender distinctions, females were more likely to be involved as perpetrators in partner violence, although women were also more likely to be injured in those violent events. They also found a family history of alcohol dependence, drug dependence, depression, or a history of physical abuse were correlated with all the aggression and injury outcomes. They found both men and women who experienced parental violence, parental substance misuse, and/or physical abuse were more likely to experience physical aggression in adulthood. However, only a history of childhood physical abuse was related to all aggression and injury outcomes, both as perpetrator and victim, suggesting the importance of childhood physical abuse as a background factor related to aggression and injury in partner relationships. They also report parental aggressiveness appears more strongly related to adult problems with violence among SUD cohorts than family history of alcoholism.

In a nationally representative U.S. sample looking at violence perpetration and victimization related to specific substance use disorder, Smith, et al.[37] found four substances – alcohol, cannabis, cocaine, and opioids – all were significantly related to IPV perpetration, although regarding cannabis, this was only after controlling for victimization. The substances most associated with IPV perpetration were alcohol use and cocaine use disorders, while the SUD most associated with IPV victimization were cannabis and opioid use disorders.

Again, there were some sex-related surprises in the findings. Women in treatment for SUD were slightly more likely to report IPV perpetration than were men (6.9% vs. 4.0% respectively) and conversely slightly more men reported IPV victimization (5.6%) than women (5.0%). The associa-

tion with cannabis use disorder (CUD) and IPV perpetration among women was no longer statistically significant after controlling for victimization. This could indicate that women with a CUD were more willing to defend themselves from violence by returning violence in a domestic dispute. Only after controlling for male victimization did an association with a CUD and male IPV perpetration become significant. Again, this may indicate those with a CUD are more likely to return violence directed toward them. Among both men and women, CUD was more associated with IPV victimization. Since these data do not determine in what order cannabis use and violence occurred, it also might be those with CUD use marijuana as an analgesic or sedative after an incident of IPV.

Cannabis Withdrawal & Violence

An often-overlooked risk factor for marijuana-related violence among friends or intimate partners is more biological, with studies reporting THC withdrawal as an important and often overlooked issue.[17, 21, 22, 28] Kouri et al.[21, 22] report that cannabis withdrawal results in anxiety, irritability, lower mood, heightened tension and more aggressive responding particularly on days 3 and 7 of abstinence. This was compared to controls who were former or light marijuana users, and to the participants' own baseline responding. By day 28 of abstinence, the participants' aggression levels had returned to their own baseline and resembled that of light users. This is supported by Allsop et al.,[1] who found two common THC withdrawal symptoms are irritability and periodic angry outbursts. An angry outburst, while not the most common symptom, was the one the participants themselves found most troubling, indicating they did not view this as their typical behavior. Especially in the presence of other distal or proximal factors that can independently promote violence, withdrawal effects that heighten anxiety, irritability and aggressive responding can increase the odds of a violent event. Indeed, in their discussion of marijuana and intimate partner violence, Cafferky et al. [7] note that, while marijuana has been heralded as a lower-risk drug than others, "this does not necessarily mean marijuana use is less dangerous for the user's intimate partner as marijuana withdrawal symptoms have been linked with irritability, anger, and aggression which could conceivably lead to IPV."

Cannabis, Mental Health & Violence

Several studies also looked at the role of cannabis and violence in those with mental health disorders. One of these, a literature review by Walsh et al. (2017),[40] dismisses findings of a relationship between cannabis and harm to self or others as "equivocal," "controversial," or "inconclusive" based on the direction of causation not being firmly established in some studies. Oddly, although they note the evidence is uncertain, they conclude "Cannabis use does not appear to increase risk of harm to self or others." However, when controlling for multiple substance use disorders and multiple mental health conditions, cannabis use is repeatedly associated with violent offending, self-reported violence, and self-harm. The interplay of cannabis use, psychosis, and violence should not be overlooked.

Johnson, et al. (2016)[20] found patients in a bipolar disorder manic phase admitted to an inpatient facility were more likely to have cannabis metabolites in their urine, had shorter hospital stays prior to being released than did those who tested negative, and were more agitated and more likely to need oral medications to deal with their agitation. The shorter stay might be due to the manic effect being more of a toxic cannabis effect that wore off more rapidly than other causes. This is supported in research reported by Johns (2001)[19] in which 20 patients with both psychosis and high urinary cannabinoids were matched with cannabis-free control patients. The cannabis-positive group had more hypomania and agitation. Hypomania is a milder manic state characterized by increased energy, decreased inhibitions, an inflated sense of self-esteem, and less need for sleep. They further report data from the Epidemiologic Catchment Area Survey, finding 19.2% of those qualifying for a cannabis abuse or dependence diagnosis acknowledged a past year episode of violence such as hitting a partner, bruising a child, or getting into a fight with a weapon. This is compared to 2% of those who had no psychiatric diagnosis reporting violence meaning those with a cannabis abuse/dependence diagnosis were 9 times more likely to report violence. They note this does not establish causation but does suggest a strong correlation. This was a higher risk for violence than was found in those with schizophrenia disorder (6x) without cannabis use, but lower than in those with alcohol abuse or dependence (11.9x).

Psychosis is a known risk factor for violence (Walsh et al., 2002)[39] and cannabis use is a known risk factor for psychosis disorders. Strakowski (2000)[38] found those with bipolar disorder and cannabis abuse symptoms/syndrome were significantly more likely than bipolar non-users to spend a larger percentage of time in manic states but not more in depressed states. Moore, et al. (2007),[29] in a systematic review of multiple studies, also found a clear relationship between cannabis use and psychosis. Pooled analysis found about a

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40% increase in risk among those who ever used cannabis for later psychosis illness to emerge. The risk level increased to 50-200% in those using more heavily and every study found a dose-response effect – the more cannabis used, the higher probability of a future psychosis disorder. Moreover, they note the presence of any substance use disorder along with a psychosis disorder significantly increases the risk of violence.

In a retrospective study of 1,582 patients in an Italian inpatient psychiatric clinic, Carabellese et al.[8] found those who used or abused cannabis were associated with increased violent events. Cannabis users as a group were significantly younger (mean age = 32.2 years) than the rest of the cohort mean age 45.8 years). Of the total cohort only 11.4% used or abused any substance but those who did accounted for 79.5% of violent incidents in the group. Cannabis use/abuse plus a mental disorder was present in 3.9% of those with violent behavior but in only 0.2% of clients without violent behavior. Thus, cannabis use/abuse was nearly 20x more prevalent in the violent group. This does not establish causation, but it suggests the two are intertwined. Multivariate analysis found significant odds for increased violence toward others or self among those using cannabis regardless of the mental health diagnosis or other substance abuse. It is important to note these findings are in a group with mental health diagnoses and cannot be presumed to reflect a general population.

Cannabis use/abuse & Violence Odds Ratios - Carabellese et al.[16]

- Violent episodes = OR 10.2, (CI=3.8-27.5) p=<0.05

More specifically, with a history of cannabis use/abuse odds of violence increased significantly:

- Injuries by beatings – OR = 5.3, (CI=1.6-15.1) p=<0.05
- Maltreatment and beatings – OR = 3.4, (CI=1.4 – 8.3) p=<0.05
- Violence & verbal threats – OR = 3.5, (CI=1.5 – 8.1) p=<0.05

With cannabis use/abuse, odds of self-harm (self-inflicted injuries, mutilation, suicide attempt, suicide) were also increased.

- Overall self-harm - OR = 5.7 (CI 2.4 – 13.5) p=0.05
- Attempted suicide – OR = 17.6 (CI 3.5 – 87.7) p=0.05
- Suicide – OR = 3.2 (CI = 1.2 – 9.6) p=<0.05

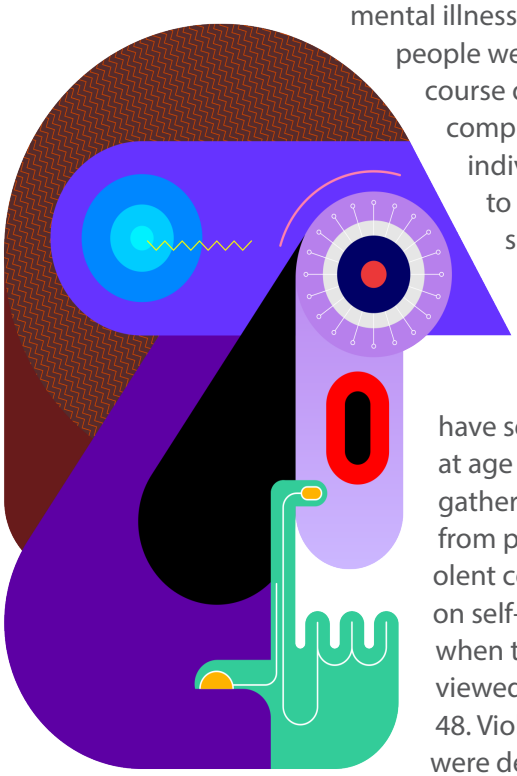
All associations persisted regardless of sex, age, or psychiatric disorder.

These authors conclude by noting: "In our study, substance abuse is confirmed as a specific risk factor for violent behaviour. These results concerning substance use/abuse should be highlighted: 4 out of 5 subjects that use/abuse substances exhibit violent behaviour. Cannabis, particularly, is more proportionately correlated to violent behaviour than other drugs. Regardless of the type of psychiatric disorder, cannabis use/abuse is associated with violent behaviour inflicted on the self and others, and constitutes a specific risk factor. Moreover, in our sample violent behaviour was correlated only to cannabis use/abuse and had a tendency to recur, being 'immediate' and therefore difficult to predict."

These findings were supported by Dugre' et al. (2017),[13] who followed a group of 1,136 psychiatric patients after discharge from treatment. Using temporal sequencing, generalized estimating equations (GEE), and a study of potential bidirectional association (violence increased cannabis use vs. cannabis use increased violence), they found significant odds that those persisting in cannabis use following discharge were 2.44 times more likely than cannabis non-users to display violent behaviors (OR 2.44, CI 1.06-5.63, p<0.05). In fact, they found a more consistent role for cannabis use in predicting violent behavior in this cohort than did alcohol or cocaine use. They note: "Hence, contrarily to studies reporting a reciprocal relationship [between cannabis use and violence], we rather found that it was cannabis use that predicted future violent behavior. The reverse relationship was not statistically significant."

Three additional studies of the relationship between cannabis use and violence in those with mental health issues[11, 12, 25] had similar findings. Using the Overt Aggression Scale, Maremmani (2004)[25] found past and current cannabis users scored higher than non-users on violence and clastic aggression scales. Clastic aggression is defined as indirect aggression toward another such as efforts to damage the person's standing in a group via gossip, character assassination, and so forth. Dharmawardene & Menkes (2017)[12] note that, in a cohort of 141 mental health patients, a history of cannabis use significantly predicted a lifetime history of violence. Using scoring of the Cannabis Use Disorder Identification Test, revised (CUDIT-R), they found the odds of a violent history increased an average 5.7% for every unit increase in the score. Conversely, gender, age, ethnicity, alcohol use disorder (AUDIT) score, and psychiatric diagnosis did not. Dellazizzo et al. (2019),[11] in a literature review of those with severe mental illness, found an over 3x greater risk for violence (OR 3.02, CI = 2.01 – 4.54, p= 0.0001) among those with severe mental illness who used cannabis versus those who did not. Distinguishing between those using cannabis without a disorder and those with a CUD, the odds ratio for violence in users without a disorder was 2.04, while risk for violence in those with CUD was increased to 5.8x greater odds. They note that, while a literature review cannot establish causation or direction of causation, the association is clearly an issue in the proportion of the population with mental health issues. These multiple studies support a conclusion that cannabis use is uniquely involved in higher rates of violence in those with mental health disorders.

What do we know about a connection between marijuana and violence in a more general population and controlling for other mental health disorders? Schoeler et al. (2016)[36] conducted a longitudinal, multiple time-point study of 411 young males from a homogenous section of working-class homes in London – the Cambridge Study in Delinquent Development. The purpose of the study was to explore the link between cannabis use and violence to establish whether the association was valid, and to specifically explore the direction of causation by controlling for numerous factors over a period of years. The group was 97% white, and all were raised in two-parent homes. They were interviewed eight times from age 8 up to age 48. Researchers controlled for known confounders including social class, family history of violence/criminality, anti-social personality disorder, alcohol abuse, drug use other than cannabis, cigarette use, and mental illness. Seventy-one (71) people were lost during the course of the study, leaving complete data on 340 individuals. Those lost to the study were not significantly different than those who remained except they were somewhat less likely to have self-reported violence at age 18. Researchers gathered data annually from public records on violent convictions and data on self-reported violence when the group was interviewed at ages 18, 27, and 48. Violent convictions (VC) were defined as robbery, assault, threatening behavior, or possessing an offensive weapon, and tracking of public court conviction records was continued each year until the cohort was 56 years old. Self-reported violence (SR-V) included assaults, fights, or use of a weapon in physical fights. This is the longest duration study to explore the issue of cannabis use and violence.



Most of those in the study neither used cannabis nor had violent convictions or self-reported violence. Only 22% self-reported violence after initiating cannabis use and only 7% had violent convictions after beginning cannabis use. While having used cannabis at any one point in time did not predict violence, persistent cannabis use did. Those who reported cannabis use at each of the age 18, 27, and 48 assessments were significantly more likely to have VC and SR-V than those who never used cannabis, even after controlling for the multiple confounders noted above. Those who reported using cannabis at one time point did have increased odds of violence, but the finding was not significant after controlling for confounders. Only continued cannabis use was predictive of future VC (OR 7.08, CI 2.19 – 23.59) and future SR-V (OR 8.94, CI 2.37 – 46.21). In fact, continued cannabis use was the most powerful predictor of violence among all the risk factors. It exceeded the predictive power of antisocial personality disorder for VC (OR 3.23) or SR-V (OR 2.15), and the predictive power of family history of criminality, alcohol or nicotine use for SR-V (OR 2.51, OR 1.65, OR 1.41, respectively).

This study was specifically designed to overcome the limitations of self-reported violence, associational findings, brief follow-up, simple intoxication, personality disorders, and other confounders. The authors note that, to appreciate the significance of this finding, the odds of violent convictions or self-reported violence in those using cannabis over an extended period of time (40 years) was roughly equivalent to the odds of developing lung cancer after a similar period of nicotine use in the UK (OR 8.3, CI 2.3 – 29.7). The largest limitation of this study was that it included only males, mostly Caucasian, and findings could be different for females or other racial/ethnic groups.

Such a finding begs for a mechanism to explain it. There are several known mechanisms that might contribute to this finding, and they are not mutually exclusive, meaning an individual could have one or several of these factors at play in the lead-up to a violent episode. Acute cannabis intoxication, while often calming to many, may lead to lower inhibitions in the case of provocation and a more impulsive response. Those who experience a cannabis-induced psychosis are more likely to engage in violence. Marijuana is also known to impact cognitive function in a way that might create frustration or misunderstandings in dealing with others. Also, THC withdrawal is known to produce uncharacteristic irritation and angry outbursts. In some settings, these symptoms could enhance the odds of violence. This would make even more sense considering a longer history of use, and therefore a higher likelihood of cognitive impairment or physical dependence, was what best predicted a link between cannabis use and aggression.

A final and admittedly more speculative possibility, and not

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one explored explicitly in any of the more current research on cannabis and violence, is that THC is known to suppress REM sleep and dreaming (Schierenbeck et al.).[35] In animal studies, suppressed REM cycles are associated with more aggressive responding in social settings.[2] In addition, THC withdrawal is associated with sleep deprivation, with longer times needed to get to sleep and vivid dream states attributable to REM rebound which can further disrupt sleep patterns. That is, one of the most reliably reported symptoms of THC withdrawal is vivid, disturbing dream states that can interrupt sleep.[1] In research not related to cannabis use, aggression can result from disrupted rhythms in the sleep-wake cycle (Bronsard & Bartolomei, 2013)[6] because disrupted sleep appears to increase negative responses to neutral stimuli, promote stronger defensive reactions to perceived threats, and heighten an individual's threat-perception, especially when provoked or frustrated (Krizan & Herlache, 2106).[23] More research is needed to clarify how significant this potential mechanism might be of marijuana-disrupted sleep and aggression.

This is important because marijuana is becoming widely viewed as a good coping tool for PTSD, especially for its ability to improve sleep.[40] It is easy to see how this belief might arise. If THC suppresses REM sleep and its accompanying dream states, and those with PTSD have troubling dreams, then THC certainly could improve sleep quality in the short term, and that effect is reported anecdotally. It is important to keep in mind the much of the evidence for positive effects of marijuana on PTSD symptoms is either anecdotal or some clinical trials with short durations. However, longer term use or developing physical dependence (and a period of abstinence/withdrawal) might disrupt sleep and increase irritability, threat perception, or aggression in those with PTSD as an unintended consequence. This suggests that, over time, cannabis use for PTSD may increase problems with sleep and violence. Well designed, long-term clinical trials are needed to explore this issue.

Conclusion

While not all studies have found a link between marijuana use and violence, the evidence trends in the direction of that connection being real. In fact, multiple factors link marijuana use to violence. Some are associations without causal links. Those with conduct disorder, antisocial personality disorder, or certain other personality disorders are more likely to use marijuana recreationally, and they are also more likely to engage in disruptive, violent behavior. Drug dealing also appears more common in young people with a cannabis use disorder, and participation in such an illicit economy increases the risk for violence. These factors appear to explain a good deal of, but not all, the association between cannabis use and violence in younger populations. Having a family history of parental aggression or childhood abuse is predictive of violence and might also be predictive of cannabis use. Therefore longitudinal, prospective studies give us the best information on cause versus simple correlation.

However, in both youth and adults, there is evidence of causal associations. These can be linked to increased paranoia and toxic psychosis states while under the influence. They can be related to irritability and angry outbursts during withdrawal. They might even be linked to changes in threat perception due to cannabis-induced disruptions of sleep. Each of those in the presence of heightened emotions of frustration, fear, paranoia, or excitement can lead to violence. If there are distal factors (e.g., a history of childhood abuse, antisocial personality disorder, peer influences, etc.), these cannabis related factors can take on even more power.

The associations found in these studies are not good news for those wishing to portray marijuana as a benign substance. If the associations between marijuana and violence are non-causal, they suggest that marijuana use might serve as a marker for more violence-prone individuals. If marijuana use becomes more normative, this association could weaken if more people who are not so violence-prone begin to use it. However, when the association is likely to be causal, it suggests marijuana use – particularly in paranoid or psychosis states and marijuana withdrawal states – may be a condition making a person more violence prone, especially in settings where they feel threatened or where emotions are running high.

Most researchers recommend further longitudinal research be undertaken to better understand the marijuana/violence connection and to define the mechanisms of causation, should they exist. This is especially important considering changing social policy giving more access to cannabis and lowered public perception of risk from its use. Finally, several studies also strongly recommend those programs seeking to reduce violence should do a careful assessment of substance use, substance use disorders, and especially cannabis use disorder. Addressing those dependence issues appears to have the potential to significantly reduce the risk for aggression and violence in treatment groups, intimate relationships, and possibly in larger communities.

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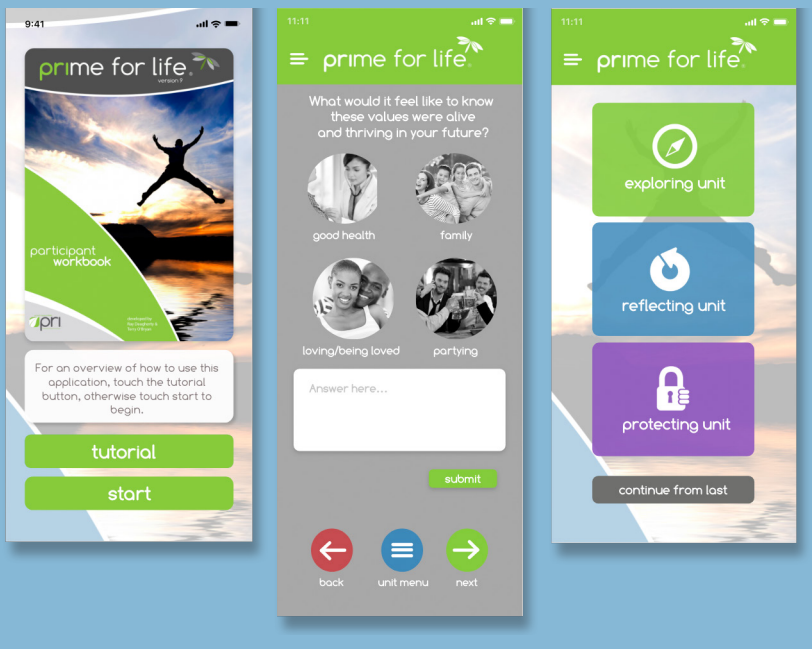
Looking to the future

Mobile Workbook App on the horizon

Before our world changed forever with recent events surrounding COVID-19, PRI had already been thinking about the future of delivery of Prime For Life. One of our most exciting intiatives is the development of a native mobile device (phones, tablets) app for the participant workbook.

While it's still early in development (prototyping), the app will allow students to fully interact with the workbook via their mobile device while going through Prime For Life. We'll share more as we get closer to delivery. We hope you'll be as excited as we are!



Supervision:
Does it matter in client outcomes?

David Rosengren, President, PRI

We frequently hear about the importance of supervision, but we rarely see research that carefully evaluates its effects. Bosari and colleagues (Bosari et al., 2019) recently published a remarkable little article evaluating what effects supervision had on practitioner behavior over time, and then examined what impact this had on client outcomes. The results are intriguing.

The Executive Director listened politely. He used evidence-based programs and was on the cutting edge of treatments for his methadone clinic. I was a researcher at the University of Washington's Alcohol and Drug Abuse Institute, and we'd been discussing what it takes for practitioners to learn and use an evidence-based practice. We'd bumped up against the importance of supervision and that most agencies either did not do it or only did reviews of paperwork and case conceptualization. He was not unsympathetic to the argument, but he threw down two gauntlets. First, his organization wouldn't be reimbursed for this time and so this became a burden of cost-efficiency. Second, he'd be willing to absorb that cost if there were good data showing improved practitioner skill leading to better outcomes for clients. At that point, 20 years ago, he was indeed accurate on this last point. The research was showing promise, but there were limits to the tools and data demonstrating supervision changed outcomes.

Fast forward 20 years and the situation has changed in many ways, but not in others. Reimbursement for time remains a challenge for programs offering services. Business owners are left with competing values of being profitable and providing the care clients require. But, for the other challenge – research demonstrating effectiveness – the sky is much clearer. The research literature has been gathering and, in particular, the research in motivational interviewing (MI) has been leading the way in establishing what is needed for effective use of evidence-based practices.

Let's be clear. Implementation science points toward the essential nature of supervision after initial training in maintaining and enhancing skills. For example, a recent meta-analysis by Schwalbe, Oh, & Zweben (2014) suggests that without coaching and feedback, MI skills tend to erode six months after training. This is the same finding for other evidence-based practices. Moreover, we know something about what's important (coaching and feedback using a coding instrument), and the frequency (at least four times over six months). Despite having this knowledge of what matters, it is also clear the supervisors often engage in other types of supervision behavior (Beckman et al., 2017). Indeed, the modal form of supervision in the drug and alcohol treatment field seems to remain a review of paperwork completion and case discussion.

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We also know that therapist behavior influences client behavior (e.g., Apodaca et al., 2015), which in turn influences outcomes (e.g., Gaume et al., 2016). It's not a matter of just engaging in MI consistent behavior, but rather how these behaviors are deployed (Barnett et al., 2014). What's been missing in this sequence of research is a study demonstrating that supervision improves performance over time, and that this in turn influences outcome. This is what Bosari and colleagues set out to investigate in a secondary analysis of data gathered about the value of a single session of brief motivational interviewing (BMI) done with college students following an alcohol policy violation. This evaluation spanned two separate studies done in two locations, but which shared comparable methods and instruments.

Implementation science points toward the essential nature of supervision after initial training in maintaining and enhancing skills.

Let's review a few ideas about the methodology that matter. First, they used standardized measures evaluating outcomes for alcohol use and alcohol problems. These were evaluated 6 months post completion of the intervention for outcomes. Second, there was a standardized coding instrument used to evaluate practitioner and client behaviors. Third, there was a total of 14 therapists, with three therapists in Study 1 completing an average of 30 BMI sessions, while 11 Study 2 therapists completed an average of 15 sessions. Fourth, therapists had varying degrees of prior experience with MI, with the Study 1 therapists having no prior experience and 7 of 11 Study 2 therapists having served in a prior BMI study; but all received the same 20 hours of initial MI training and completed pilot clients to criterion before beginning the trial. Fifth, the investigators statistically accounted for a number of "nuisance variables" like the intensity of treatment (e.g., did therapists who saw more people, or more people in a shorter period of time, differ from other therapists?). Sixth, the sample of students were from two universities in the northeastern United States and were primarily white and male. Seventh, the therapists received weekly supervision that included coaching of skills in using MI and feedback on their use of MI using a standardized instrument (MI Skill Code 2.0; Miller et al., 2003).

What did Bosari and colleagues discover?

To begin, regardless of being a novice or experienced MI user, therapists improved their use of MI over the course of the two trials. This was measured by an increase in MI consistent skills (MICO), a decrease in MI inconsistent skills (MIIN), and a reduction in other therapist behaviors (Other; e.g., giving information, disclosing personal information). That is, sessions done later in the study showed therapists doing better quality MI, regardless of beginning experience level.

Second, they found over this same set of sessions clients decreased their neutral language (typically done after an "other response" by therapists) and increased their change talk. Sustain talk remained low throughout, but did show a nonsignificant upward movement. This was likely a function of therapists remaining on topic, eliciting more ambivalence about the change, and exploring this in an effort to elicit motivation for change. Relatedly, when they engaged in MICO they were less likely to stray into off-topic discussions facilitated by therapists' use of "other responses."

If we want this evidence-based practice to improve outcomes, supervision of our actual practices is important.

Third, the authors found that, as MICO behavior increased, drinking outcomes improved, particularly in heavy drinking clients. For lighter drinking clients, the supervision did not appear to influence the outcomes. That is, lighter drinking people early in the intervention sequence did as well as those later in the sequence. It might be that skill level was not quite as important with this group, but rather the intervention alone was enough.

Fourth, therapists' initial experience did not predict outcomes, but experience with supervision in these sessions over time did.

Finally, in a somewhat surprising finding, Bosari and colleagues did not find that change talk predicted outcomes; this is contrary to other research by the authors and by others. They note several possible explanations for this outcome, including the structure of the intervention, the timing

of the change talk (early vs. late in a session), and potential less investment in the change talk because of the session elements.

What does this mean for us? It once again suggests that simple exposure to a new, evidence-based practice is not typically enough. A well-designed intervention with lighter drinking clients and adequate counselor behavior may be enough, but our clients usually have more alcohol (and drug) engagement than that. If we want this evidence-based practice to improve outcomes, supervision of our actual practices is important. Finally, being experienced is not enough either. As we all know, we can fall into habits of things we like and do, which have little relationship to what make changes in client behaviors. The good news? PRI has coaching and feedback available if we want to continue to improve our skills. To register for Prime Solutions Coaching: primeforlife.org/Event (choose top Webinar)
For more information: david.rosengren@primeforlife.org

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Fourth and finally, there is still uncertainty in our field about these conditions as well, and there is a very important distinction we need to make. For decades, professionals have been trying to fit DSM concepts with their own understanding of alcohol and drug use and misuse. Terms like "alcohol dependence" and "drug dependence" have been used interchangeably with alcoholism and addiction, even though dependence was actually a broader construct than either alcoholism or addiction. While the three-part – mild, moderate, and severe use disorder – continuum represents a research-based advance in nosology, we still believe it lacks explanatory power for what happens when people pass a trigger point and experience loss of control. Given this condition – loss of control – determines whether a person with alcohol-related problems can drink small quantities of alcohol without problems, it is of great practical importance to identify it correctly. We need language that accurately distinguishes that condition, where the only known low-risk option is abstinence, from those conditions where this is not the case. Use disorder labels do not make this important distinction.

For these reasons, we retained the terms of alcoholism and addiction. However, I want you to know we took your concerns seriously and it sparked an in-depth discussion as a training and curriculum development team in response to them.

Cheers! David

Thanks to Alicia, and to all of you, for helping us be our best!