The Not-so-Natural Drug and Its Impact on the Developing Brain

By Sarah

"*It's natural, practically legal, and not nearly as bad as the other stuff I could be doing*." These are common one-liners youth use too often as an effort to justify why smoking weed "*isn't that bad*" for them. Several factors influence this naive perspective, but as educators, we get the opportunity to shed some light on the real impact.

Although some studies show that the percentage of youth using cannabis has slightly decreased over the past couple of years, the 2023 National Survey on Drug Use and Health showed that 6.17% of 12-17-year-olds in Nebraska still reported using drugs in the last 30 days at the time of the survey. Among 12-17 year olds who used illicit drugs in that month, 90% reported marijuana use. A decline in use is a hopeful glimmer, but there's still work to do.

Here's what we know.

1. **New millennium marijuana is different from 1970s marijuana.**

In the 70s, the average level of THC was just 1%. Now, vapes and joints regularly push 30% THC, while some waxes, edibles, and other concentrates hit 90-95% THC. Dr. Beatriz Carlini, a research scientist at the University of Washington's Addictions, Drug and Alcohol Institute, described today's high-THC concentrates being "as close to the cannabis plant as strawberries are to frosted strawberry Pop-Tarts." Not so natural and far more potent, increasing risk of harm and addiction.

2. THC has a harmful impact on the developing brain of an adolescent.

The adolescent brain is still under construction and isn't completely developed until the age of 25. This means that kids are navigating middle school, high school, and a bit beyond without a fully developed brain. The last part to develop is the prefrontal cortex, which plays an important role in regulating mood, attention, impulse control, and the ability to think rationally. The part of the brain in the driver's seat during adolescence is the amygdala, which is activated by potential threats and strong emotions like fear and anger. It's what sounds the alarm if you're in the woods and you see a bear. This explains why teenagers respond to varying levels of stress as if it's a matter of survival. Their brain sees a bear. This contributes to the risk-taking and peer-influenced behavior in youth. It also increases the probability of addiction, as their brains are highly sensitive to substances and experiences that provide that dopamine rush they crave.

Research also shows that marijuana use negatively impacts brain functioning by decreasing synaptic pruning. This leads to more gray matter in the outer cortex and lowers the efficiency of communication between higher-order areas of the brain. Imagine our neurons trying to send messages through mud. The route is unclear, and the message gets lost.

Below are some examples of what this impact can look like in real life.

- Problems with memory and concentration
- Difficulties with learning and problem-solving

- Decreased reaction time and coordination
- Increased aggression
- Decreased motivation and lack of interest
- Car accidents
- Increase in risky behaviors
- Increase use of other drugs or alcohol
- Interference with prescribed medication

3. **THC has long-term implications for mental health and wellness**.
Cannabis use has been linked to a range of mental health problems, such as depression, anxiety, and suicidal thinking. People who use cannabis are 4x more likely to develop temporary psychosis (not knowing what is real, hallucinations, and paranoia) and long-lasting mental disorders, including schizophrenia. The association between cannabis and schizophrenia is stronger in people who start using cannabis at a younger age and/or use more frequently. Approximately 30% of people who use THC develop Cannabis Use Disorder, showing an addiction and dependence on the drug. Some signs and symptoms of Cannabis Use Disorder include unsuccessful attempts to quit despite negative physical, psychological, and social impacts, and giving up important activities with friends and family in favor of using cannabis. Again, the risk of developing an addiction is stronger in people who start using cannabis during their youth or adolescence. Lastly, smoked cannabis can harm lung tissues and cause scarring and damage to small blood vessels. It can also make the heart beat faster and raise blood pressure, which can lead to increased risk of stroke, heart disease, and other vascular diseases.

We know there's power in numbers, and I'll end on a high note. The 2024 National Monitoring the Future Survey showed that 89.5% of eighth graders, 80.2% of tenth graders, and 67.1% of twelfth graders reported abstaining from use of any drug in the past 30 days prior to the survey. For the two older grades, that percentage increased by about 4% from 2023 to 2024. This reiterates an important reality that kids need to hear. Most youth are choosing not to use illicit substances. Kids should feel confident that when they refuse to try or continue drugs or alcohol, the majority are also saying no. Regardless of where kids are in the pressure loop of substance use, we got their backs. I'm grateful to live in a community where people approach kids with compassion and support. Keep up the good fight, empowering all kids to make informed decisions and providing them with tools to improve wellness and achieve success.

Resources
American Academy of Pediatrics https://www.healthychildren.org/English/ages-stages/teen/Pages/Whats-Going-On-in-the-Teenage-Brain.aspx

American Psychological Association
https://www.apa.org/monitor/2025/06/marijuana-potency-policy-risk

American Academy of Child & Adolescent Psychiatry
https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Marijuana-and-Teens-106.aspx

National Center for Drug Abuse Statistics
https://drugabusestatistics.org/teen-drug-use/#:~:text=Marijuana%20Abuse,are%20to%20smoke%20a%20cigarette.

The Benefits of Practicing Gratitude

By Abbe

Practicing gratitude has numerous benefits for both physical and mental well-being. Neuroscience research has shown that expressing gratitude activates areas of the brain involved in reward, which plays a role in the regulation of emotions and behavior (National Institute of Health). When we practice gratitude, our brains release dopamine and serotonin, which increase our feelings of happiness and contentment. While this is helpful for people of all ages, it is especially impactful for kids and teens because their brains are still growing and developing. When youth practice gratitude consistently, it reinforces these positive neural responses, promoting a long-term sense of wellbeing.

In addition to increased happiness, practicing gratitude offers youth numerous benefits, including:

- Reduced negative feelings: Research has found that youth who engage in regular gratitude exercises reported higher levels of life satisfaction and optimism, along with lower levels of stress and depressive symptoms (The Journal of Positive Psychology).
- Improved coping skills: Gratitude builds emotional resilience, enabling youth to handle stress and adversity more effectively.
- Increased self-esteem: Focusing on the positive aspects of life can lead to a boost in self-esteem.
- Stronger relationships: By helping youth recognize the kindness and support of others, gratitude strengthens relationships with family and friends.
- Increased compassion: Practicing gratitude can increase empathy and sensitivity toward others.
- Reduced aggression: Grateful individuals are less likely to show aggression or retaliate when faced with negative behaviors.
- Better sleep: Positive thoughts, including those related to gratitude, can lead to longer and better-quality sleep.
- Boosted immunity: Gratitude is associated with a stronger immune system, possibly due to improved sleep and overall happiness.

Adults can play an important role in helping youth to practice gratitude. In fact, research shows that when parents/caregivers are more grateful, their children often express more gratitude (Anxiety and Depression Association of America). To teach youth gratitude, start by modeling it. For example, express thanks for everyday things in your own life such has a healthy meal or someone's kindness. Below are other strategies adults can use to teach youth the art of gratitude:

- Point out generosity: When you see others being kind, point it out to youth to encourage them to notice it too.
- Start a gratitude routine: Establish a regular practice of gratitude through bedtime reflections or making gratitude part of meal routines.
- Keep a gratitude journal or jar: Have youth write or draw things they are thankful for in a journal or on small notes to put in a jar.

- Use thank you notes: Teach the importance of expressing thanks by having youth write and deliver thank you notes for gifts or help.
- Encourage and engage in acts of kindness: Volunteer to help others or help your child sort and donate items to foster a sense of gratitude for what they have.
- Focus on experiences: Help youth appreciate non-material things like time spent with family or a sunny day.
- Practice mindfulness: Encourage being present in the moment to better appreciate the current one.

Consistently practicing gratitude can help youth develop a resilient and optimistic outlook that can benefit them throughout their lifetime. By incorporating small gratitude habits into daily routines, adults can create supportive environments that encourage kids to recognize and appreciate positive aspects of their lives. The month of November is a great time to start practicing gratitude!

References: Anxiety and Depression Association of America; Harvard Health; National Institute of Health; The Journal of Positive Psychology

Social Media Addiction

By Tessah

I began this article with the intention of exploring various aspects of social media and mental health, including its effects on brain development, social benefits and implications, correlations to attention deficits and sleep, parental controls, etc. However, I quickly realized this topic is too broad for one article. Therefore, I will focus specifically on social media addiction in this piece. For those interested, I have linked additional articles on the SCIP website that cover the other topics mentioned, with a direct link provided below.

Social media addiction is a common term thrown around today, with the caveat that social media addiction is not formally recognized as a disorder within the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, DSM-5, and therefore, cannot be formally diagnosed as a mental disorder. Today, leading experts within the behavioral health field have instead developed terms like “problematic social media use” to describe the negative consequences associated with social media.

To understand how addiction occurs, let's first break down the **brain’s natural reward system**. This is a network of brain structures and pathways developed for an evolutionary purpose to reinforce positive behaviors that help increase the chances of survival and reproduction. Simply explained, when a behavior occurs, such as when water is consumed, the brain’s reward system releases a neurotransmitter called **dopamine**. In turn, dopamine causes a feeling of pleasure, reinforces behavior, and motivates the individual to repeat the behavior. In this example, the person drinks the water again, dopamine is released, the behavior is reinforced and repeated, so the individual ultimately survives and reproduces offspring.

However, when addictive behaviors are enacted, a series of processes occur that hijack the brain’s natural reward system. When the addictive behavior is introduced, the brain’s reward system releases more dopamine compared to natural behavior. As a result, the person experiences a more intense feeling of pleasure, and this addictive behavior is more strongly reinforced. Over time, this becomes problematic because the brain develops a tolerance to addictive behavior and reduces the amount of dopamine and dopamine receptors released when the addictive behavior is enacted. Therefore, the individual no longer feels the same heightened pleasure. To compensate, the person must engage in the addictive behavior for increasing amounts of time to receive pleasure, and before long, the individual needs to engage in this addictive behavior to experience any pleasure or to avoid withdrawal symptoms. Eventually, addictions begin to interfere with a person’s ability to meet their regular responsibilities and disturb their interpersonal relationships. This overly simplified explanation of how a behavioral addiction occurs can be explored in depth by evaluating articles posted to the SCIP website.

Still, how is social media addictive?

"Social media platforms drive surges of dopamine to the brain to keep consumers coming back over and over again. The shares, likes, and comments on these platforms trigger the brain’s

reward center, resulting in a high similar to the one people feel when gambling or using drugs." In this quote, Dr. Nancy DeAngelis, CRNP, and Director of Behavioral Health at Jefferson Abington Hospital, explains how social media's engagement features and notifications seize the brain's natural reward system to feed addictive behavior and keep the user coming back to the platform.
Let's break this statement down:

Each platform utilizes **engagement features**, such as likes, shares, comments, saves, direct messages, and mentions. These features measure engagement and/or provide more engagement opportunities for the platform's users. When a user receives one or many of these features, for example, a like, dopamine is released. As we've already established, when dopamine is released, behaviors are reinforced and, therefore, the user is incentivized to repeat the action: in this case, to post again.

All platforms use **notifications** to inform their users of these engagement features and to re-engage their users. For example, when receiving a push notification (when the user is not already on the platform) of a new like, comment, or share, this invites the user to open the platform to seek more rewards and to reinitiate engagement. Notifications for direct messages and new connections are more random and build anticipation for the user.

Social media platforms use **algorithms** to drive engagement. An algorithm is a process used to develop a cultivated social media feed that keeps the users on the platform for as long as possible. This process analyzes all the users' interactions (likes, shares, comments, saves, etc.) with their feed, their mood, the user's preferences/ interests, their relationships/ connections, and time spent on each post to determine what content to show the user in order to keep that user on the platform and to ensure the user comes back.

Social media's engagement features, notifications, and cultivated feeds are examples of **variable rewards**. A variable reward system is inherently addictive because it uses unpredictable incentives (likes, shares, saves, comments, notification of new connections, etc.) that release dopamine to keep the users engaged in a constant cycle of anticipation and craving. This can be explored more in depth by reviewing the article Reward Variability and Frequency as Potential Prerequisite of Behavioral Addiction, see below.

Because social media addiction is not a formal diagnosis with specific criteria, finding statistics to use to show its prevalence, risk factors, and protective factors has been challenging, as the research is limited.

One study titled, Understanding Social Media Addiction: A Deep Dive suggests that up to 20% of teenagers meet specific criteria for social media addiction. In 2024, the World Health Organization reported that 11% of adolescents show signs of problematic social media behavior, with a higher rate being females. Another stat was that 36% of young people reported constant contact with friends online, and the highest rates were among 15-year-old females at 44%.

A literature review titled Research Trends in Social Media Addiction and Problematic Social Media Use: A Bibliometric Analysis assessed social media addictions and the Big Five

personality traits and found three groups of individuals with increased social media use and addictions: individuals with high extraversion scores, individuals with social anxiety, and individuals with psychiatric disorders. As for mental health disorders, social media usage has a positive association with individuals with attention deficit hyperactivity disorder, obsessive compulsive disorder, and anxiety. The same review found that when social media addiction decreases, life satisfaction increases.

Furthermore, we can assess the etiologies of all addictions to determine what the potential causes of social media addictions are. There are three overarching themes: biological, psychological, and environmental factors that interact with each other and contribute to why an individual becomes addicted to a substance and/or behavior. As for biological factors, a person may be predisposed to addiction because of their genetics. The individual's neurobiology and brain development influence their susceptibility to addictions as well. Psychological factors like a preexisting mental health condition, experiencing trauma during their lifetime, and personality traits like impulsivity and having a low tolerance for stress can make a person vulnerable to addictions. Environmental factors, such as peer pressure, socioeconomic factors, significant and recurring stress, and the individual's home environment (family's values and norms), including their parents' involvement and parenting styles, also play key roles in this complex determination of an individual's susceptibility to addiction. Age of introduction, frequency, and duration of use are important to evaluation as well.

On a final note, as with all addictions, social media addiction causes a physiological effect to occur within the brain's natural reward system that causes that addicted individual to seek out the social media platform, despite serious consequences for doing so. So, the next time you see a child or adolescent reacting intensely to having their device or social media account taken away, consider that their brains have undergone the same alterations as a person who experienced an addiction to alcohol and drugs.

More articles with information on social media within the mental health domain can be found on the SCIP website and are linked below.

Sources:

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