Early Childhood Risk Factors, Dopaminergic Pathways, and Propensity to Social Media Addiction: A Narrative Review

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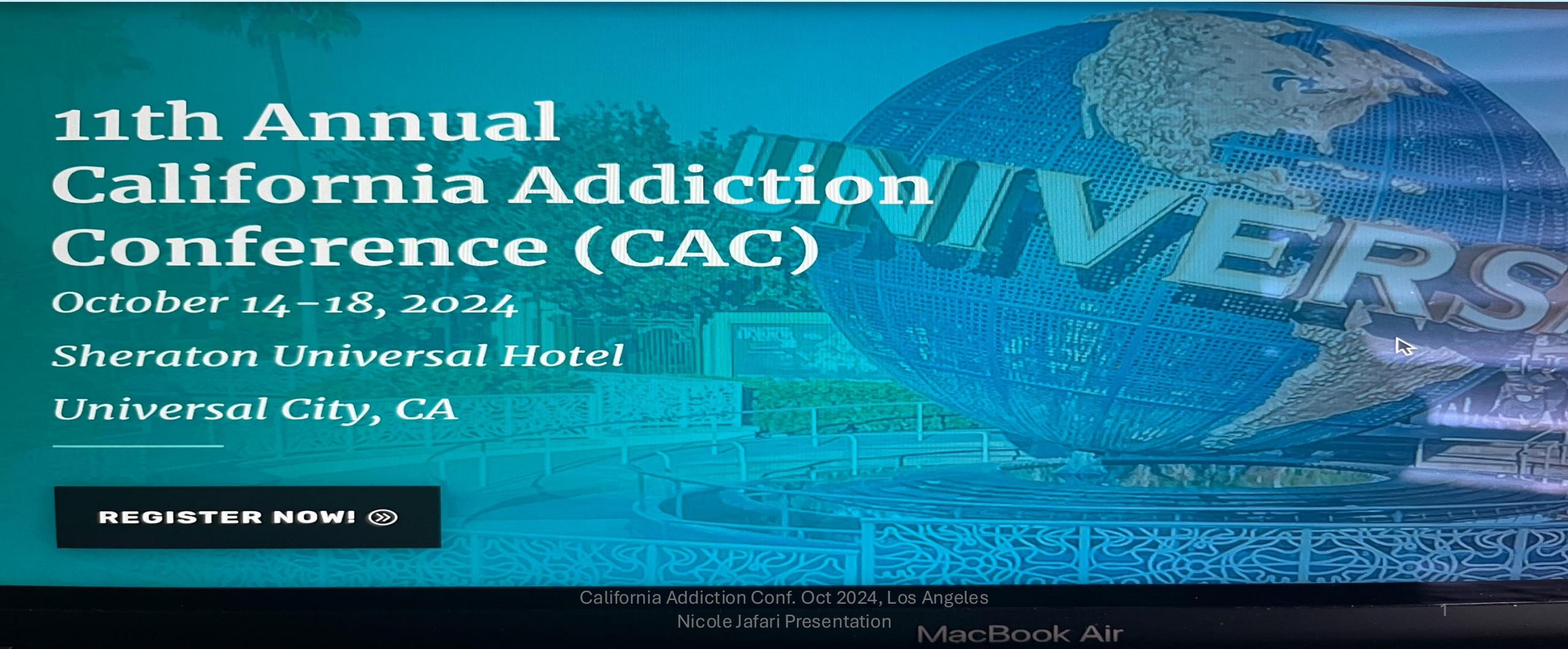

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Nicole Jafari Presentation

What is Addiction?

- Addiction is a strong physical or psychological need or urge to do something or use something.
- It is a dependence on a substance or activity that can cause significant harm to the individual, their relationships, and their daily life.
- Excessive use of Social Media can lead to Behavioral Addiction over time, no matter how it started or why.
- One of the most valuable tools in understanding addiction is the 4Cs:
  - **Craving, Compulsion, Control, and Consequences**.

4 Cs of Addiction

Addictive Behavior Using Screen Time

- Developmental Harms:
  - Screen time affects language development, diminishing the quantity and quality of interactions between children and their caregivers (Sanders et al., 2018).
  - Digital technology negatively impacts a child's behavior, social skills, sleep, and physical activity (Sanders et al., 2018).
  - Screen usage can also lead to problems in social-emotional development, including obesity, sleep disturbances, depression, and anxiety.
  - It can impair emotional comprehension, promote aggressive behavior, and hinder social and emotional competence.

Prevalence of Global Screen Time Addictive Behavior

Video Game Addiction

- Hong Kong: On average, 13.9% of male students play video games over 20 hours a week.

- South Korea declared gaming disorder a public health crisis since more than 600,000 children struggle with it.

    - South Korea declared video game addiction a public health crisis since more than 600,000 children struggle with it.
    - 8.4% of children and teenagers are addicted to gaming, of which 11-12% are boys and 6-7% are girls.

- In the US, UK, Canada, and Germany, 0.3% to 1% of the general population fit the video game addiction diagnosis criteria.
- According to Dr. Alok Kanojia, the world expert in video game addiction psychiatry:
    - The highest prevalence of video game addiction in the world is in Iran, and it's 22.8%.
- Video Game Addiction

Worldwide Video Game Addiction Statistics

- Over 2 billion people play video games globally, of which 150 million are in the United States.
  - Several surveys indicate that Internet Gaming Disorder (IGD) affects between 1-10% of Europe and North America.

- Among adults in the US, UK, Canada, and Germany, 0.3% to 1% of the general population fit the criteria for an IGD diagnosis (Przybylski et al., 2016).

- A national survey of “internet addiction” in Japan showed that 0.7% to 27.5% of the sample population exhibited signs of IGD ranged from (Mihara & Higuchi, 2017).

- A study of Norwegian gamers showed that 1.4% of the sample could be classified as addicted gamers, while 7.3% were problem gamers (Wittek et al., 2016).

Social Media Use Among Young Kids

- Up to 95% of youth ages 13–17 report using a social media platform, with more than a third saying they use it “almost constantly.”
    - Even though a minimum age of 13 is commonly the required minimum age for social media platforms in the U.S.
- Nearly 40% of children ages 8–12 use social media.

NIH - National Library of Medicine

Global Screen Time and Problematic Behavior

- 1 in 10 adolescents (11%) show signs of problematic social media behavior, struggling to control their use and experiencing negative consequences.
    - Girls reported higher levels of problematic social media use than boys (13% vs 9%).
- Over a third (36%) of young people reported constant contact with friends online, with the highest rates among 15-year-old girls (44%).
- A third (34%) of adolescents play digital games daily, with more than one in five (22%) playing for at least four hours when they engage in gaming.
- 12% of adolescents are at risk of problematic gaming, with boys more likely than girls to show signs of problematic gaming (16% vs 7%).

- World Health Organization

Objective 1:

Identification of The Early Childhood Risk Factors

Indicative

of Triggering Addictive Behavior Later in Life.

Early Childhood Risk Factors of Addictive Behavior

- Psychological
  - Attention-deficit/hyperactivity disorder
  - Oppositional defiant disorder or conduct disorder
  - Major depressive disorder
  - Social anxiety disorder
  - Externalization
  - Internalization
- Environmental:
  - Parenting style, parental addiction, SES, child abuse, contextual stressors, Maltreatment, abuse, etc.

Risk Factors Source

Early Childhood Risk Factors of Addictive Behavior Cont'd

- Neurobiological Differential:
  - The presence of a greater ratio of orbitofrontal-to-amygdala volume,
  - Smaller orbitofrontal cortex volume,
  - Lower levels of P300 amplitude,
  - The P300 (P3) wave, event-related potential (ERP) component elicited in the decision-making process.
  - An endogenous potential, as its occurrence, links not to the physical attributes of a stimulus but to a person's reaction to it.
    - A reduced P300 amplitude may reflect other deficiencies in complex cognitive processes, including working memory and contextual updating (Scharinger et l., 2017; Howe et al., 2014; Cui et al., 2017).
  - Dopaminergic pathways

- Risk Factors Source

Role of Genetics in Addictive Behavior

- A gene variant in the brain reward circuit of the dopamine D2 receptor A1 gene can cause significantly reduced dopamine D2 receptors, possibly 47 million years ago, providing risk-taking behavior and hunter-gatherer benefits (Hammond et al., 2018).

- Early *homo sapiens* evolutionarily relied on strong dopamine release to assist in defense and survival.
  - In modern times, high dopamine (hyperdopaminergia) release seen in adolescence developmentally augments the euphoric response of powerful psychoactive drugs like opioids, cocaine, cannabis, and alcohol, as well as addictiveness to palliative foods (Wang et al., 2021).

- In 1995, one of us coined "Reward Deficiency Syndrome (RDS). " "Reward Deficiency Syndrome" was first coined by Kenneth Blum as:

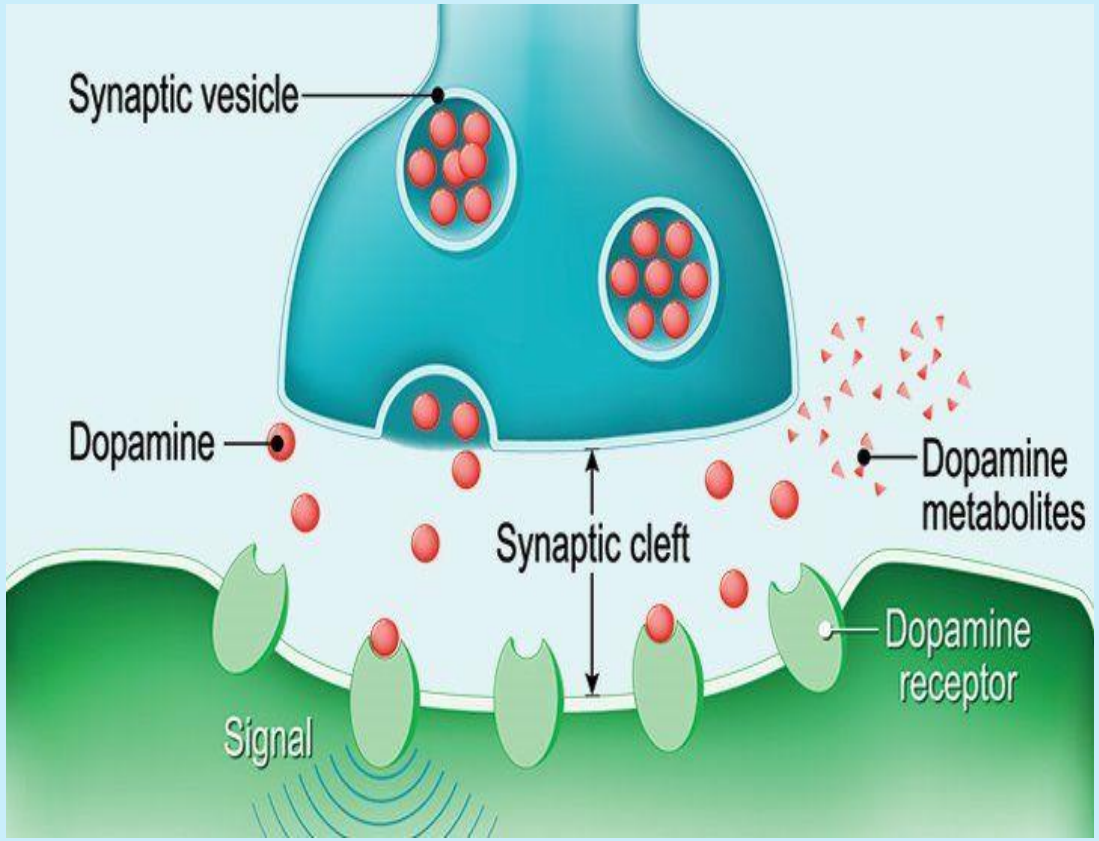
  - A brain reward is genetic dissatisfaction or impairment that results in aberrant pleasure-seeking behavior that includes drugs, excessive food, sex, gaming/gambling, and other behaviors.

  - Based on the overwhelming literature coupled with our recent GWAS and PGX work, we suggest "Reward Deficiency" as a more general term encompassing the nosology of "pre-addiction."(Moran et al., 2021).

Objective 2:

The association between early childhood risk factors in constructing dopaminergic neural pathways.

How Does Dopamine Work in the Brain?



- Dopamine is produced in several areas of the brain, including **the substantia nigra and the ventral tegmental area**.
- It is a neurohormone that is released by the hypothalamus.
- Its action is as a hormone that inhibits prolactin release from the anterior lobe of the pituitary.

The Benefit of Dopamine in the Brain

- Dopamine helps communicate messages across different parts of the brain and between the brain and the rest of the body.
- Dopamine is a chemical messenger naturally released from nerve cells in the brain. It acts on cells in different brain parts to produce various effects.
- One of its functions is to create a good feeling after you do something enjoyable — this makes you want to do it again, and this is why dopamine plays a role in addiction.

Role of Dopamine in the Human Body

Dopaminergic pathways in the brain are involved in many physiological and behavioral functions, including:

- Movement:
  - The nigrostriatal pathway, a crucial part of the dopaminergic system, not only controls movement but also integrates sensory information, a fascinating aspect of our brain's functioning.

- Reward:
  - The mesolimbic pathway is associated with pleasure and reward, starts in the ventral tegmental area (VTA), and connects to the nucleus accumbens, which are associated with motivation and reward.

Role of Dopamine in the Human Body Cont'd

- Cognition: Dopamine enables successful cognitive control in the prefrontal cortex.
  - Dopamine receptors in the prefrontal cortex intricately control three key aspects of cognitive control: gating, maintaining, and relaying.
  - This showcasing the complexity and sophistication of their role in our cognitive processes is a testament to the brain's intricate design.
  - Early screen exposure has been associated with lower cognitive abilities and academic performance in later years (Sanders et al., 2016).
  - The two prominent dopamine receptor families, D1R and D2R, play complementary roles in cognitive control, a testament to the brain's intricate design.

Cognition & Dopamine Source

Role of Dopamine in the Human Body Cont'd

- Emotional regulation: Dopamine, a key player in our brain's reward system, is intricately involved in emotional regulation. Higher dopamine levels can lead to euphoria, bliss, and enhanced motivation and concentration.
  - Exposure to substances and activities that increase dopamine can become addictive to some individuals.
    - Emotion & Dopamine Source
- Hormone regulation: Dopamine plays a role in hormone regulation.
  - Dopamine also acts as a hormone. Dopamine, epinephrine, and norepinephrine are the central catecholamines (a label based on having part of the same molecular structure).
  - The adrenal gland, a small hat-shaped gland on top of the kidneys, makes these hormones.
  - Dopamine is also a neurohormone released by the hypothalamus in your brain.

Hormone Regulation & Dopamine Source

Dopamine Effect

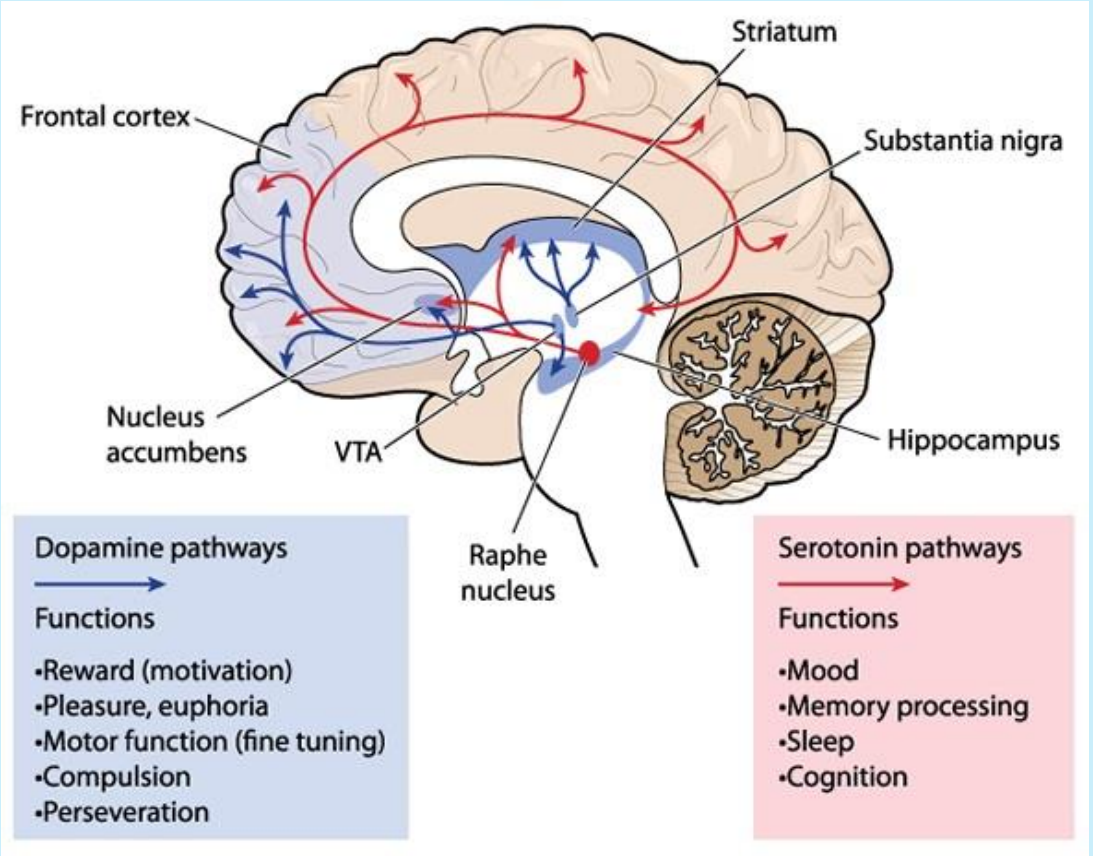
- Dopamine acts on brain areas to give you pleasure, satisfaction, and motivation.
- Dopamine also has a role to play in controlling memory, mood, sleep, learning, concentration, movement, and other body functions.

Dopaminergic Effects

- Without enough dopamine, this balance is disrupted, resulting in tremors (trembling in the hands, arms, legs, and jaw); rigidity (stiffness of the limbs); slowness of movement, and impaired balance and coordination

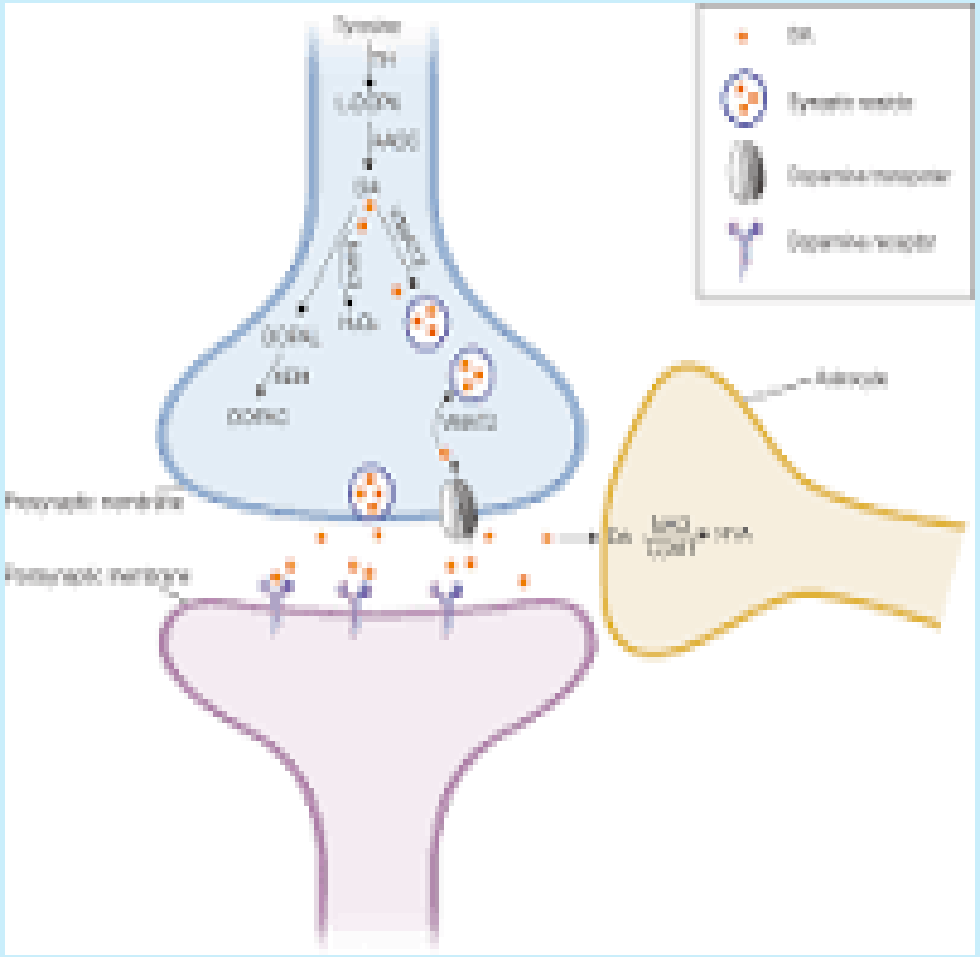
Dopamine Pathways and Dopaminergic

- Dopaminergic means "related to dopamine" (literally, "working on dopamine"), a common neurotransmitter.
- Dopaminergic neurons are a type of neuron in the central nervous system that produce dopamine, a neurotransmitter, and play a key role in brain function.
  - Dopaminergic Neurons
- Dopaminergic substances or actions increase dopamine-related activity in the brain.



Dopaminergic Abnormality

- Malfunctions of the dopaminergic are show in various mental disorders such as addiction, attention- deficit/hyperactivity disorder, Huntington's disease, Parkinson's disease (PD), and schizophrenia.
  - Dopaminergic Dysfunction
- Without enough dopamine, this balance is disrupted, resulting in tremors (trembling in the hands, arms, legs, and jaw), rigidity (stiffness of the limbs), slow movement, and impaired balance and coordination.



Dopamine Overload

- High dopamine symptoms include **anxiety, excessive energy, insomnia, and hallucinations**.
- Low dopamine levels are associated with brain fog, mood swings, and muscle spasms.
- Causes of Dopamine Deficiency include **sleep deprivation, obesity, drug abuse, saturated fat intake, and stress**.

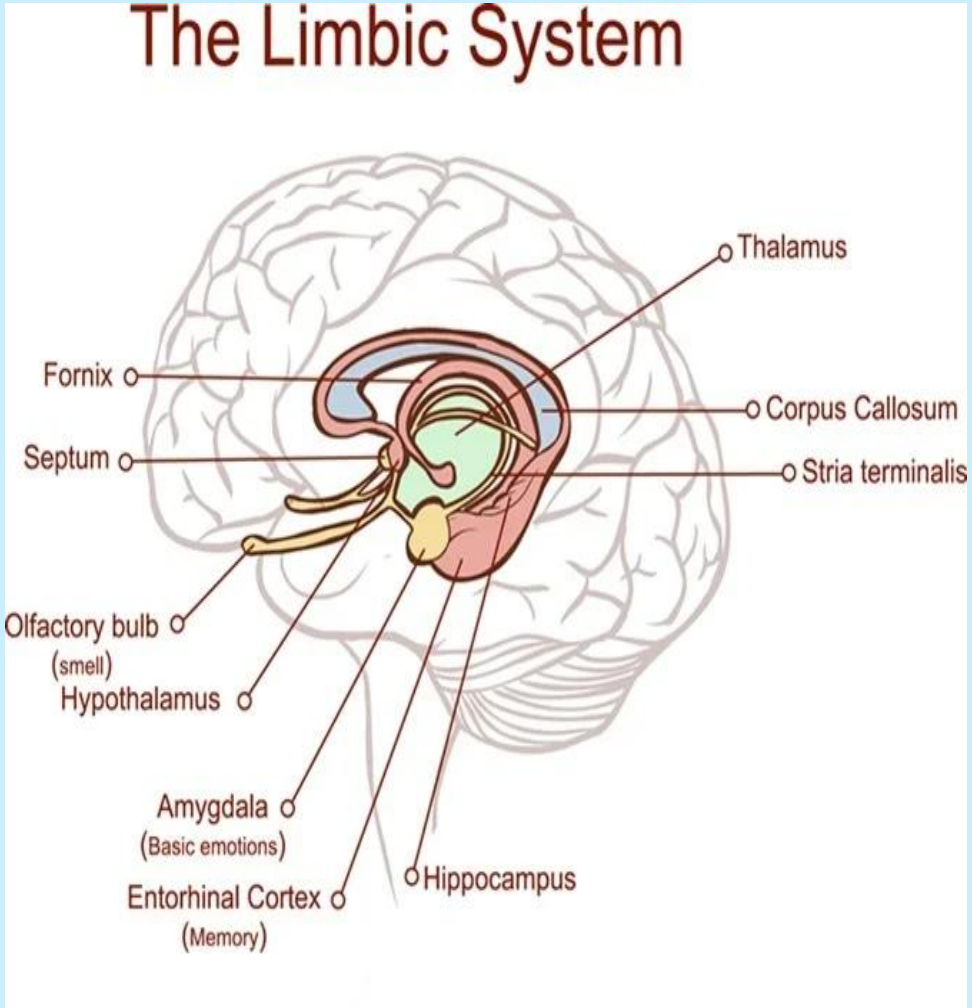
What happens if you have dopamine deficiency?

- Dopamine deficiency can affect your physical and mental health. Many medical conditions are linked to low levels of dopamine, including Parkinson's disease, restless legs syndrome, depression, schizophrenia, and attention deficit hyperactivity disorder (ADHD).
  - Anxious or moody
  - Depressed or hopeless
  - Forgetful
  - Indifferent about things you used to enjoy
  - Unable to concentrate
  - Unable to sleep
  - Unmotivated
  - Uninterested in sex
  - Withdrawn

- Dopamine Deficiency Source

Other Symptoms of Lack of Dopamine

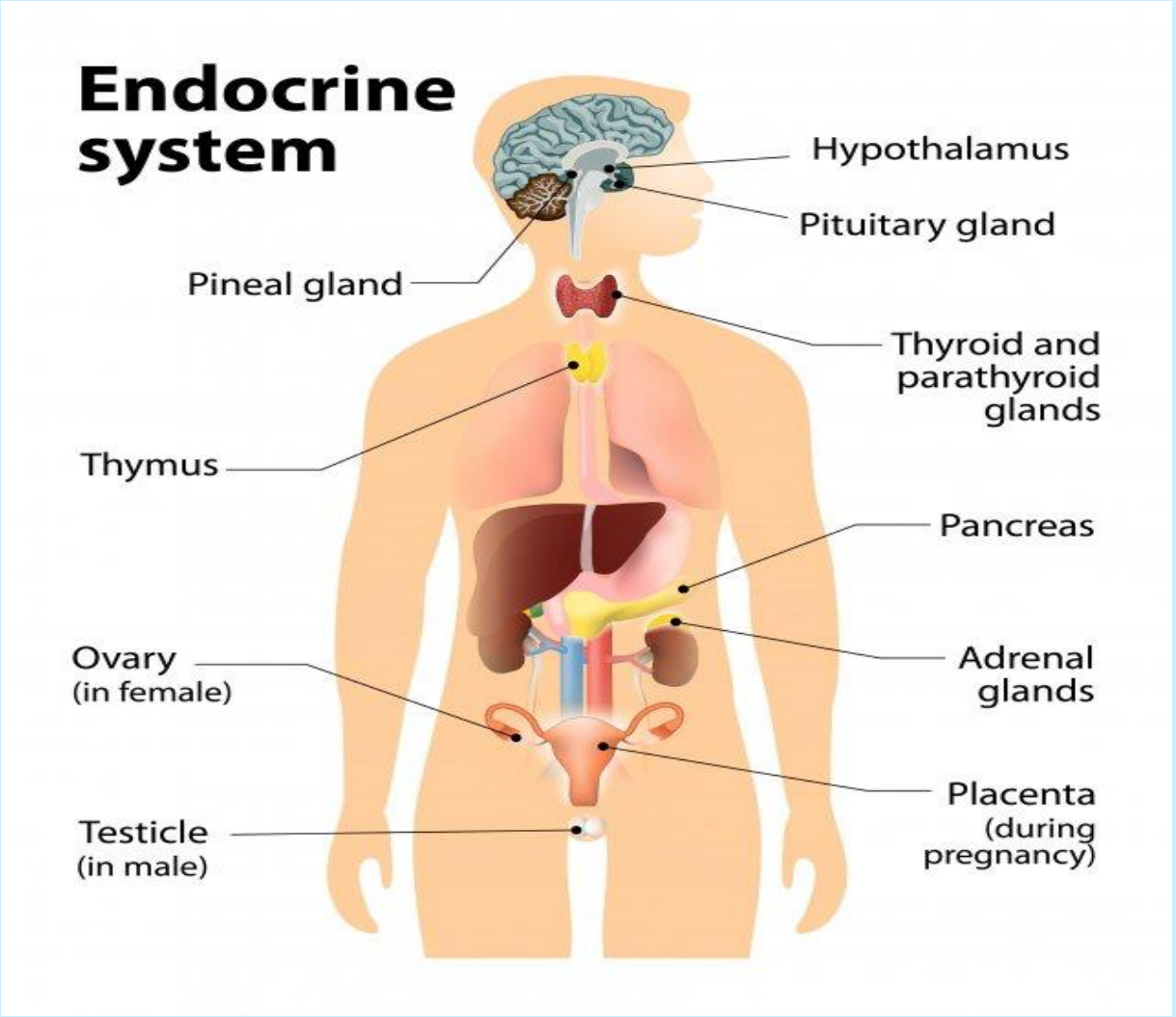
- Can cause:
  - Anxiety
  - depression
  - Fear of missing out (FOMO) Low self-esteem
  - Feelings of isolation and loneliness
  - Exposure to cyberbullying and negative behavior
  - Disruption in normal sleep and eating habits
  - Decreased physical activity Ignoring the “real world”
  - Poor performance at work or school
  - Developing a warped sense of reality
  - Experiencing withdrawal symptoms when not on the internet or social media



- The limbic system consists of several interconnected brain structures, including the amygdala, hippocampus, hypothalamus, cingulate gyrus, mammillary bodies, and the entorhinal cortex; essentially, it is a network of structures primarily responsible for processing emotions, memory, and motivation.

Endocrine System:

- Endocrine glands release hormones into the bloodstream.
- The endocrine system includes the hypothalamus, pineal gland, pituitary gland, thyroid gland, parathyroid glands, thymus, adrenal glands, and pancreas.
- It also includes the testes in males and the ovaries and placenta (during pregnancy) in females. Glands and organs of the endocrine system.



Social Media and Dopamine

- Social media can trigger dopamine release because dopamine receptors are activated when users receive positive feedback, such as when the individual receives likes, shares, and comments on social media.
- This type of pleasure experience can trigger the brain's reward center, causing a high similar to gambling or using drugs.
- This fact should raise concerns about the potentially addictive nature of social media.
- However, the workshop aims to provide hope and empowerment by discussing ways to combat social media addiction.
- Additionally, artificial intelligence algorithms contribute to dopamine release, a key feature of many social media platforms.

Signs and Symptoms of Internet and Social Media Addiction

- **Losing Track of Time**
  - They often intend to go on the Internet or check Facebook for just a few minutes but still be scrolling an hour later.
- **Excessive Use**
  - Research suggests that more than *20 hours* of personal internet/social media use per week constitutes an addiction.
- **Compulsive/Constant Accessing**
  - After checking their phone or social media, they re-access it a few minutes later without much thought to see if there are any updates. This may also occur when you are out socializing and accessing their phone/device numerous times throughout your time with others.
- **Irritability**
  - Access to the internet and social media regulates mood. Constantly checking/accessing the device causes agitation and irritability until the individual gets their "fix."
  - This is often referred to as withdrawal.
- **Impact on Relationships**
  - Friends and family become irritated or frustrated that the child/person spends more time on social media than with them.
  - They may be accused of spending more time with their “Facebook family” than the real ones. The individual may even want to lie about internet use or go into another room or outside to access the internet/social media in private.
- **Impact on School or Employment**
  - Due to accessing the Internet for personal reasons or being on social media accounts longer than intended, they often need to complete assignments on time or remember work that needs to be done. They may be browsing more online than they are doing actual work.

Screen Time Withdraw

Consequences for kids of endless screen-time

Objective 3: Investigate the efficacy of protector factors such as cognitive reconstruction, sensorimotor repair, and neuroplasticity:

1) Interventions
2) Strategies
3) Recommendations

1) Interventions: Awareness Integration Theory

- An all-encompassing approach is needed to treat addiction and restore healthy relationships. Awareness Integration Theory (AIT) is a multidimensional therapeutic approach that fosters deep self-awareness, emotional intelligence, and behavioral transformation.
- AIT helps individuals uncover and process underlying emotional wounds, limiting beliefs, and maladaptive patterns that contribute to addictive behaviors.
- Through a structured, step-by-step methodology, AIT facilitates clients in gaining clarity about their inner world, understanding the root causes of their addiction, and developing healthier coping mechanisms.
- The theory's emphasis on self-exploration and accountability empowers clients to break free from the cycle of addiction by promoting sustainable change.
- By integrating insights from cognitive-behavioral therapy, mindfulness, and emotional processing, AIT offers a comprehensive framework that addresses both the conscious and subconscious factors driving addiction and how addiction impacts all areas of life.

Evidence-Based AIT

- AIT's F2FC therapeutic sessions showed a decrease in depression by % 76 and anxiety by %60 while increasing self-esteem by %43 and self-efficacy by %20[3].
- A study on the American college student population using the Awareness Integration Theory in a hybrid modality showed an overall 68% decrease in depression and a 21.72% decrease in anxiety[4].
- In a workshop setting, the AIT has also been tested on separated or divorced individuals, resulting in a 27.5% improvement in depressive moods, a 37% decrease in feelings of anxiousness and anxiety while showing a 15% increase in self-esteem, and a 13% boost in self-efficacy[5].
- Additional studies utilizing AIT via telehealth resulted in a decrease in anxiety by %50 and an increase in self-esteem by %60, and in another case study, decreased depression by %66, anxiety by %75, and post-traumatic stress disorder (PTSD) symptoms by %66[6].

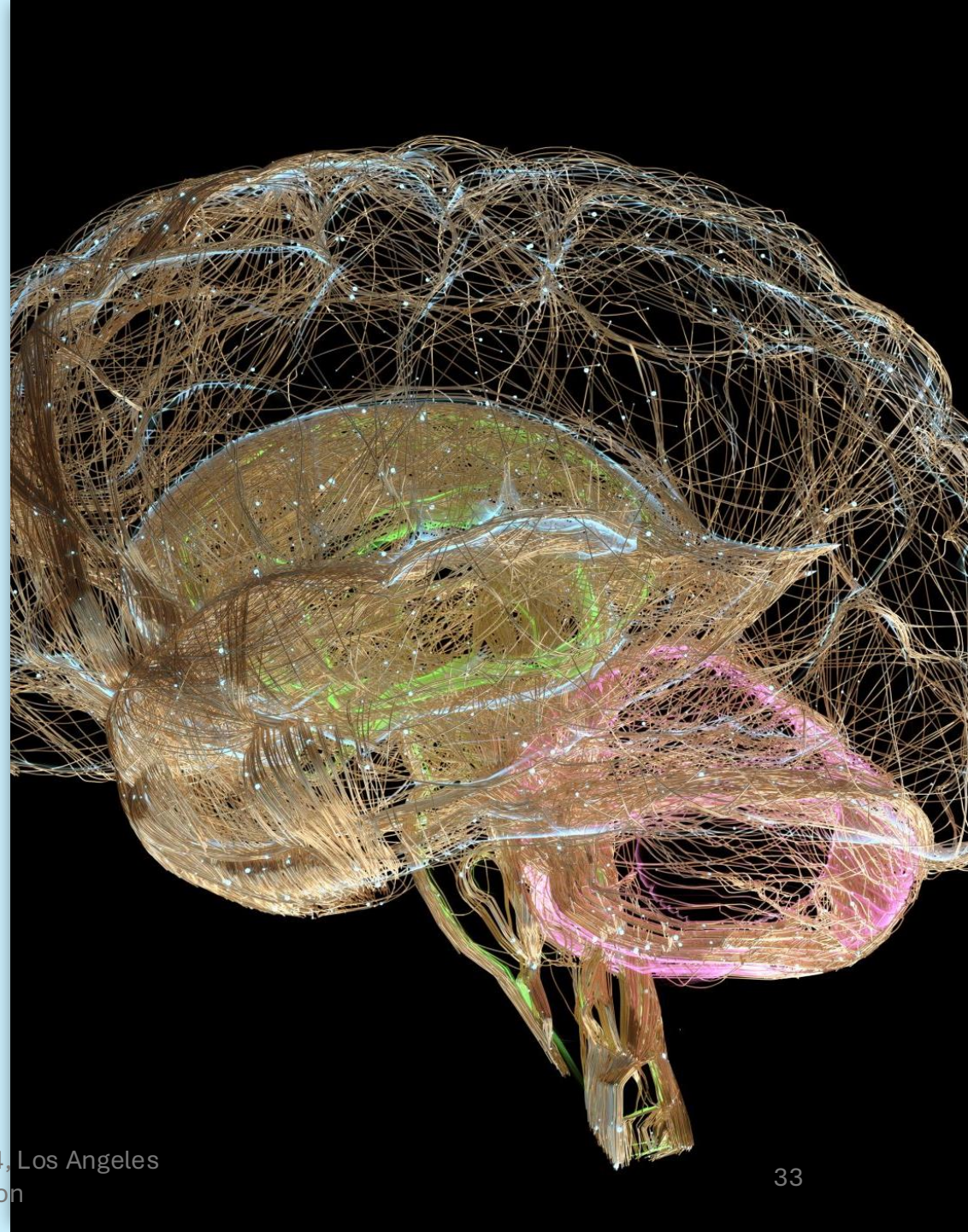
The Antecedent of Genetics and Self-Awareness

- A high degree of stress brought on by traumatic experiences can lead to the malfunction of the brain reward circuitry.

- Dopamine neurotransmitters responsible for pleasure, learning, and motivation can run low or be blocked from reaching the intended brain receptors by stress.

- Low dopamine secretion in a stressed individual may lead to unhealthy behaviors and post-traumatic stress disorder. Blum and colleagues have linked this poor circulation of dopamine to Reward Deficiency Syndrome (RDS) (Blum et al., 1996; Blum et al., 2000).

- Dopamine deficiency may also be correlated to hereditary and genetic dispositions.



AIT's Primary Goal

To foster awareness as well as an integration of all the split parts of the self from the past into the present. This is achieved by utilizing the following interventions:

- Exploring one's thought patterns, feelings, behaviors, and the impact of that attitude on every realm of life
- Exploring the assumptions that one lives by about others and the corresponding actions and reactions arising from these assumptions
- Identifying negative and/or irrational core beliefs that are creating limitations in the client's life
- Dismantling negative core beliefs into neutral/positive and functional beliefs and attitudes in every area of life
- Integrating the separated parts into the system as a whole
- Choosing workable and healthy values and ways of thinking, feeling, and behaving in all areas of life
- Envisioning tangible goals and systematic action plans for each area of life-based on the chosen values
- Establishing external feedback systems to ensure the sustainment of healthy values, thought patterns, emotional regulation, and behaviors

Building Interpersonal Allies

- AIT helps individuals identify and recognize their strengths and build vital interpersonal allies (Zeine, 2016).
- Finally, focusing on an individual's strengths and empowering them to build on them while developing more vital coping skills provides a healthy foundation for individuals to fall back on if and when they stop receiving services.
- In Phase Five, the therapist investigates the client's selected values concerning areas of life previously discussed.
- Encouraging clients to think, feel, and act to actualize a chosen value system from their robust and proven skill set will result in a desired attitude and identity.
- Due to this new commitment, short—and long-term goals are created and scheduled, and action plans are set to achieve the intended outcome.
- During this phase, the therapist determines the client's abilities and skills that require improvement. The ability to choose who one wants to be and act creates a powerful identity and a fulfilled life (Zeine, 2016).

Final Phase: Integration

- In Phase Six, the client selects a set of values, situationally suitable emotions, and behaviors from which to operate and live.
- The client then designs an external symbol or structure as a reminder to reinforce these beliefs and self-programming.
- Collaborating with friends, family, colleagues, and the community to form sustainable structures around goals ensures attaining a fulfilled life (Zeine, 2016).

2) Strategies to Address Internet/Social Media Addiction

- Try taking a few days off a week or month to disconnect and focus on other things.
- Delete the apps from your phone.
- By deleting the apps from your phone and/or tablet, you can significantly reduce your access to social media, making it easier to resist the urge to check your accounts frequently.
- This can help you avoid checking your accounts immediately when you pull out your phone.

2) Strategies - How to Treat Low Dopamine Symptoms

Low dopamine levels can produce adverse reactions throughout the body. Some things you can do to fix low dopamine include regular exercise, eating foods that support dopamine production, consuming probiotics, and listening to music.

- **Exercise**
  - Working up a sweat by running, swimming, dancing, or other forms of movement can help increase dopamine levels.
  - Studies on animals have shown that certain portions of the brain are flushed with dopamine during physical activity.
  - This is why exercising may sometimes produce a high.21
- **Natural Sources**
  - External sources may support your body's supply of dopamine. Natural sources such as bananas, plantain, and avocado have been found to contain high levels of dopamine. Apples, eggplant, spinach, and tomatoes have also been recognized as dopamine sources. Proteins are also notable components in the dopamine production process.22
- **Probiotics**
  - Probiotics may get more notice for promoting gut health, but this bacteria is not only an essential part of the body's microbiome; it may also be helpful for the production of dopamine and other neurotransmitters.23
- **Music**
- Music has been shown to stimulate dopamine production in the brain, generating the familiar feelings of pleasure and excitement you experience when you listen.24

2) Strategies to Address Internet/Social Media Addiction for Adults

1. Go on a Digital Detox

- Begin to reduce the amount of time that you plan to access the internet/social media.
- You can do this by setting specific times in the day when you can access the Internet or social media (e.g., during the lunch hour).
- There are also apps available that allow you to set a time limit for your social media use.
- Once that time limit is up, you can only access the internet or social media site once it resets the next day.

2. Spend Time Away From Screens

- Another strategy is to create balance in your life by setting aside specific times of the day when you are screen-free.
  - Mealtimes and before bed are perfect opportunities to enjoy peace without the distraction of technology.
- For instance, you could stop all internet use each night at 8:00 PM, allowing you to unwind and relax until 7:00 AM the next day.

3. Establish a Contingency Plan

- Build a plan around only accessing the internet/social media once you have accomplished something.
- For example, you only get to access the internet/social media after you do one hour of schoolwork, get groceries, water the plants, go for a walk, etc.

4. Reduce Your Contact and Access List

- One way to spend less time online is to reduce your number of friends/contacts on social networking sites, delete unused apps, and unsubscribe from websites with few benefits or send too many notifications.
- Also, delete time-consuming game apps.
- While few of us will ever develop an addiction to the internet or social media, we could all benefit from being mindful about our use and considering if there are areas where we need to cut back. This will contribute to our overall well-being and mental health!
  - https://ctrinstitute.com/blog/how-to-overcome-social-media-addiction/

2) Strategies - Reducing Screen Time in the Home

- Monitor children's time with all screen media
- Never put a television set in a child's bedroom
- Eliminate background television
- Limit to television on school days
- Identify non screen, in-home activities that are pleasurable to children

2) Strategies - Defining Media Literacy

- Media Literacy is the ability to access, analyze, evaluate, and create media in different contexts.

- *Media Literacy is a 21st-century approach to education. It provides a framework to access, analyze, evaluate, and communicate messages in various forms — from print to video to the Internet.*

2) Strategies - Uses of Media Literacy

- Teaching media techniques and associated critical thinking, such as:
  - Teaching how to read movies, TV, the Internet, and other nontraditional image-based texts media
- It is to engage students in exploring economic, political, social, and cultural issues in contemporary society
  - Investigate media-related issues and produce prosocial attitudes, behaviors, and solutions
- Media interventions – standard school disciplines to anti-drug programs, smoking prohibition, antipoverty efforts, positive body image, antiviolence, sobriety, nutrition education, and help-the-homeless efforts
  - Many activists are attempting to use media literacy to control absenteeism, raise grades, promote self-esteem, and reduce teacher/student/parent friction.

2) Strategies - How to do teach media literacy

- Become informed
- Become an advocate
- Understand the strengths and weaknesses
- Become and activist
- Family media literacy

2) Strategies - Teaching Media Literacy

- Media literacy & public health
  - Tobacco, alcohol, and drugs
  - Nutrition and obesity
  - Body image
- Use of emotion
  - Emotional activation techniques, participation in advocacy work, anger at tobacco companies, mistrust of alcohol corporations.
- Conundrum: Big Money
  - Organizations with vested interests see an advantage in working with media education, creating "Astroturf" (fake grassroots group), fake news reports, and articles that attack their opponents.
- Violence
  - Co-viewing
    - Adults' comments before or during media exposure can reduce the impact of violent programming on children's aggressiveness under some circumstances.
  - Changing the Media Diet
    - Restricting children's media consumption

2) Strategies - Media Literacy Programs as a Violence Intervention

- Using media production
  - Ex: Antirape productions when viewed by appropriate age group
- Channel One Research
  - Effective advertising?
  - Media Literacy Curriculum
  - Current Research
- Media Literacy & Parents
  - Parents can reduce undesirable media effects, including media-induced aggression.
- Media Literacy & Corporate Funding
  - Wealthy conglomerates can take over the media education of our children to benefit their reputation and bottom line.
    - They Do now

2) Strategies - Teaching Media Literacy

- Except for complex research interventions that use parents and limit kids' media diets, it is unclear how to use media education to change behavior; however, Media education certainly can teach:
    a. Information about the media
    b. Skills of analyzing media
    c. Techniques of media production
    d. Strategies of active involvement in media-related issues
- Affect is more important than content
- Emotion is crucial to media education

2) Strategies - Teaching Media Literacy Cont'd

- Emotion is primary
  - Dealing with media, the class must be involving and entertaining
- Asking questions about media examples and providing a guided discussion
  - Learning about media is a lifelong process
- Insert information into the discussion in a natural way
  - Information should be given as needed
- Credibility is crucial
  - Media criticism is not media education
- Fascinate students with the reality of media techniques
  - Teach about the construction and power of images but avoid continually using examples of what is wrong
  - Challenge students
  - Use of multimedia data base

2) Strategies - Content of Media Literacy

- Five traditionally accepted “basic principles” of media literacy:
  1. Media messages are constructed
  2. Messages are representations of reality with embedded values and points of view
  3. Each form of media uses a unique set of rules to construct messages
  4. Indiduals interepret media messages and create their own meaning based on personal experience
  5. Media are driven by profit within economic and political contexts

2) Strategies - How effective is Media Literacy

- They are designed to involve the whole community
- School that participated in media education classes for parents and children showed a decrease in favorable attitude towards alcohol lifestyles, alcohol and tobacco companies, and tobacco use in students
- Overall participants were happy with having taken these units

3) Recommended Healthy Use of Screen Time

- The Centers for Disease Control and Prevention (CDC) and other organizations/studies have indicated that parental restrictions on screen time and the absence of screens in bedrooms significantly lower screen time (Carlson et al., 2010; Ramirez et al., 2010).
- Ideal discretionary screen time limits are 0.5-1 hour/day for three to seven-year-olds, one hour for 7-12-year-olds, 1.5 hours for 12-15-year-olds, and two hours for 16+-year-olds.
- Role modeling is also another crucial element. The amount of screen time parents and kids watch is closely associated; kids who live in homes where watching TV is encouraged (e.g., meals eaten in front of the TV and the TV is on when the child gets home from school) are more likely to engage in binge-watching themselves.
- If parents watch television for more than four hours every day, their sons and daughters will, respectively, have a 10.5-fold and a three-fold increased likelihood of doing the same (Jago et al., 2010).

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