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Post Traumatic Stress Disorder and The Reduction of Symptoms: A Review

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Post Traumatic Stress Disorder and The Reduction of Symptoms: A Review

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Abstract

Post-traumatic stress disorder (PTSD) is a life altering and often debilitating disorder that can have a profound effect on someone's life. While there is currently no cure, research into different treatments for PTSD is ongoing. Conditions co-morbid with PTSD can cause difficulty in research. Several illegal drugs like psilocybin, cannabis, lysergic acid diethylamide, and mescaline have shown promise, but need further research as treatments for PTSD symptoms.

Keywords: Post-traumatic stress disorder (PTSD), symptoms, reduction

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Introduction

Post-traumatic stress disorder (PTSD) is a mental disorder that can develop immediately, or have a delayed onset, after exposure to a single traumatic event, or series of traumatic events. Traumatic events can be those events that have resulted in physical harm (or perceived physical harm) or includes other life-threatening components that effect a person's physical, mental, and/or social well-being. A few examples would be combat/war, rape/sexual assault, domestic violence, major accidents, and natural disasters (American Psychiatric Association, 2020).

PTSD has been known by many names including shellshock, post-Vietnam syndrome, combat fatigue, Gulf-war illness, and operational exhaustion. Those with PTSD suffer symptoms that other people can see as well as those that take place inside the mind of the patient. A few of the well-recognized symptoms of PTSD that can be seen include an extreme startle response, unprompted angry outbursts, reckless behavior, and hypervigilance, or "the elevated state of constantly assessing potential threats around you" (Brennan, 2021). Some of the internal symptoms of PTSD are an involuntary recall of the traumatic event(s) also known as flashbacks, extreme internal distress when exposed to a similar situation, and the avoidance of things that remind the patient of the traumatic event(s).

One of the biggest issues when trying to understand and treat PTSD is that not all people exposed to a traumatic event will develop PTSD. One person can be exposed multiple times and never show a symptom of PTSD, while another person can be exposed a single time to the same traumatic event and develop PTSD. Some traumatic events are more likely to result in PTSD than others. "About 3% of the adult population has PTSD at any one time. Lifetime prevalence is between 1.9% and 8.8%, but this rate doubles in populations affected by conflict and reaches more than 50% in survivors of rape" (Bisson et al., 2015, para. 3).

There are several risk factors that increase the chances of developing PTSD. According to the Mayo Foundation for Medical Education and Research, (2022) these factors include childhood trauma, experiencing multiple traumatic events, having a severe injury, watching someone be severely injured or killed, having no support after a traumatic event, dealing with added stress after a traumatic event, having family history of mental illness, and substance abuse. Seeking treatment after a traumatic event is extremely important in order to help the patient begin processing their trauma and to identify possible symptoms of PTSD.

Treatments vary for PTSD depending on what symptoms are present and the severity of those symptoms. Currently, the two most common treatments for PTSD are psychotherapy and medications. According to Vieweg et al. (2006), psychotherapy is the most effective form of treatment for PTSD and includes common therapies such as Cognitive Behavioral Therapy (CBT), Prolonged Exposure Therapy (PE), and Eye Movement Desensitization and Reprocessing (EMDR). Conventional medications may be used to treat common symptoms like sleep disturbances, anxiety, and depression.

How does someone get PTSD?

PTSD is often caused by a person's exposure to intense and/or prolonged traumatic stressors, which can be something the person experiences or witnesses. The development of PTSD is believed to be linked to the threat or danger (even a perceived threat or danger) associated with an experience or combined experiences, as well as how a person reacts to that experience. Intense and prolonged stress is more likely to lead to the development of PTSD if the person perceives the event(s) or experience(s) as highly threatening and/or out of their control. Some people may be more susceptible to developing PTSD because of their genetic makeup, as well as certain psychological characteristics, such as their level of resilience (Miao et al., 2018).

Research shows that the individuals who are most at risk have experienced multiple traumas and long-term exposure to stressors. It is believed that the greater the perceived intensity of the trauma, the greater the risk for PTSD. People who experience high levels of mental/emotional distress or who lack a social support system like close family or friends may be more at risk for developing PTSD. “Women are twice as likely as men to have PTSD. Three ethnic groups – U.S. Latinos, African Americans, and Native Americans/Alaska Natives – are disproportionately affected and have higher rates of PTSD than non-Latino whites” (American Psychiatric Association, 2020, para. 2).

People who develop PTSD may experience a variety of symptoms including nightmares, flashbacks, avoidance behaviors, anxiety, depression, as well as physical symptoms such as insomnia, fatigue, or amplified startle reactions. It’s worth noting that not everyone who experiences a traumatic event will develop PTSD, but if the symptoms last longer than a month and interfere with a person’s daily activities, it is important to seek professional help.

There is no cure for PTSD, but to help manage the symptoms, treatment typically involves a combination of psychotherapy, medications, and lifestyle changes. Psychotherapy techniques like cognitive-behavioral therapy (CBT) can help patients identify and correct maladaptive beliefs and behaviors related to the traumatic event. Medications like antidepressants and anti-anxiety medications may also be prescribed to manage emotions in a healthy way and to reduce symptoms like anxiety and depression. Lifestyle changes like the addition of stress management techniques, exercise, and a consistent bedtime routine that includes sleep hygiene techniques may be recommended to help manage the symptoms of PTSD.

Overall, PTSD is a complex and debilitating mental health disorder that is triggered by a traumatic event or experience. It is believed that the development of PTSD is related to an

individual's reaction to the trauma, as well as their biological, genetic, and psychological makeup. It is interesting to note that "CBT has been found to have an impact on the physiological parameters associated with PTSD" (Kar, 2011 para. 35). Treatment typically involves a combination of psychotherapy, medications, and lifestyle modifications to help manage the symptoms and reduce the risk of further distress.

How is PTSD Diagnosed?

If someone is concerned, they may have PTSD, the first step in a diagnosis is for a mental health professional, such as a psychologist, clinical social worker, or primary care physician, to conduct an initial assessment. This normally includes discussing symptoms and any medical or other mental health issues. It is important to rule out any other psychiatric or medical issues in order to properly diagnose PTSD.

The next step is to conduct a diagnostic interview. In this interview, a clinician will assess an individual for the symptoms related to PTSD by discussing the background of the patient, their current situation, and symptoms. This includes reviewing the criteria for PTSD outlined in the 5th edition of the Diagnostic and Statistical Manual (DSM-5). In addition to a description of the traumatic event or experience, these criteria include recurrent, involuntary, and intrusive memories of the event, avoidance of activities and people associated with the traumatic event, negative changes to beliefs and thought processes, experiences of hyper-arousal (feeling constantly anxious or on-edge), and changes in reactions and emotions.

The clinician may also choose to assess for any other mental health issues that may be typically simultaneously present (or comorbid) with PTSD. "More than 80% of PTSD patients share one or more comorbidities" (Miao et al., 2018, para. 7). This could include substance use disorders, depression, or anxiety. A clinician may also use other diagnostic psychological tests to

assess for other symptoms when determining the presence of PTSD. These tests may include the Clinician Administered PTSD Scale (the CAPS) or trauma-specific questionnaires such as the Impact of Event Scale.

In order for the clinician to make an accurate diagnosis, they must take into account not only the clinical interview, but also the subjective way that the patient views the experience, the patient's current level of functioning and impact the symptoms are having on day-to-day life, and the length of time that the symptoms have been present. An accurate diagnosis is essential for providing the best care and treatment for a person with PTSD.

Symptoms of PTSD

The symptoms of PTSD can vary from person to person and the type of trauma experienced and length of exposure is believed to influence symptoms. In some cases, those suffering with symptoms may notice changes in their behavior and connect the onset of those changes to a traumatic event. They may also have a variety of physical, mental, and emotional symptoms. However, because there are other mental disorders that commonly occur alongside PTSD and some that have similar symptoms, it can sometimes be difficult to diagnose with symptoms alone. "PTSD symptoms and signs are readily identifiable by the general internist. There is, however, considerable overlap between features of PTSD and other anxiety disorders, mood disorders, and substance abuse" (Vieweg et al., 2006). The severity of symptoms can range from mild to severe and can last from a few months to a lifetime.

According to the Mayo Clinic, there are four types of symptoms commonly associated with PTSD: intrusive memories, avoidance, negative changes in thinking and mood, and changes in physical and emotional reactions (*Post-traumatic stress disorder (PTSD)* 2022).

Intrusive thoughts and memories are unwanted, often reoccurring thoughts of the traumatic event (Mayo Clinic, 2022). They may occur at any time and can be accompanied by vivid images or sounds. This can cause great distress and can make it difficult to concentrate on other tasks or activities. Intrusive thoughts can also include nightmares and can interfere with relationships, work, and daily activities.

Patients with PTSD avoidance feel a strong urge to avoid objects or places that remind them of their trauma, along with other circumstances, people, or conversations even mildly related. For example, a veteran whose trauma occurred in combat may stop watching the news or delete their social media because certain words or images are triggering. Even certain smells can cause a flashback and sufferers attempt to avoid them the best they can.

According to the Mayo Foundation for Medical Education and Research, changes in physical and emotional reactions vary from patient to patient like many of the other symptoms can (2022). Patients with PTSD may feel detached from reality and may have difficulty engaging with others and participating in activities they used to enjoy. They may also feel a decreased range of emotions and their speech may become flat or monotone, adding to their sense of disconnection. These changes could also include self-destructive behavior (abusing alcohol, speeding) and hyperarousal (an increase in irritability and aggressive behavior, always looking for danger in their surroundings, overwhelming guilt/shame, being easily frightened).

The final category is negative changes in thinking and mood. Some symptoms in this category may overlap with the previous. Patients may feel emotionally numb or have trouble feeling positive emotions and have negative feelings about themselves or others. They may feel hopeless, like there is not future for them. PTSD sufferers may also have memory issues, short

and/or long-term, and those memory issues might even impair their memories, or parts of the memories of the traumatic event.

Other cognitive issues that people with PTSD may develop are difficulty making decisions and difficulty concentrating on tasks and information. It is important to emphasize that the symptoms of PTSD can vary, based on the individual's unique experience and the type of trauma experienced.

Why people with PTSD don't seek treatment

Unfortunately, many people with PTSD choose not seek out treatment for their symptoms for a variety of reasons. One of the most common reasons is the stigma that surrounds not only mental health disorders, but specifically the stigma of having PTSD. For some people, seeking treatment for a mental health disorder may lead to feelings of shame or failure. In addition, some cultures have stigmatizing beliefs about seeking help for mental health issues, which can be a barrier to treatment. According to PeaceHealth, people "may feel that asking for treatment is a sign of weakness...or may worry that if people find out, it could hurt their career" or other relationships (Husney et al., 2022).

According to Hoge et al. (2014), some of the major barriers to treatment for those with PTSD is the practical considerations involved in seeking help. These include factors such as cost, lack of transportation, and lack of knowledge about mental health services. In some cases, there are significant financial costs associated with treatment those with PTSD, especially if multiple treatments options are recommended by a clinician. In other cases, patients may not have access to reliable transportation to continue to attend therapy sessions or doctor's visits. Still others may be unable to leave their home due to fear or anxiety. Finally, lack of knowledge about available mental health services can be a major obstacle to seeking treatment. Without knowledge of

available resources, people with PTSD may not know how or where to seek help. Furthermore, there may be limited access to mental health services in some areas, especially in rural and low-income communities. This lack of access can further discourage people from seeking treatment.

There are also many emotional reasons why people with PTSD may not seek treatment. These include feelings of guilt, shame, and self-blame that can be associated with having a mental illness. In some cases, these feelings can be so severe that they prevent people with PTSD from seeking help. In addition, feelings of distrust and fear for clinicians or other authoritative figures can also be a major deterrent for seeking treatment or even diagnosis. People with PTSD may be afraid of what the treatment process will entail, or may be apprehensive about discussing their trauma with a stranger. These feelings can lead to avoidance of treatment.

Mental health issues can also be a major factor in why people with PTSD do not seek treatment. Symptoms of PTSD, such as difficulty concentrating, trouble sleeping, and hypervigilance, can make it difficult for people to even consider seeking help. In addition, the disorder itself can lead to avoidance behaviors. People with PTSD may feel that they do not need to seek out treatment, or may simply avoid thinking about their trauma in hopes that after enough time passes, they will get better on their own. They may also engage in unhealthy behaviors, such as self-medicating with drugs or alcohol, in an attempt to cope with their disorder (Husney et al., 2022).

Treatments for PTSD

There are several different methods that are used to help treat the symptoms of PTSD, however there is currently not a cure for the condition. The current methods of treatment focus more on managing the symptoms of PTSD. The most common methods to manage the symptoms are Cognitive Behavioral Therapy, Dialectical Behavior Therapy, Eye Movement

Desensitization and Reprocessing, medication, or a combination of them. There is also a growing trend of alternative treatments of PTSD like, acupuncture, meditation, and relaxation.

Cognitive Behavioral Therapy

During Cognitive Behavioral Therapy (CBT), negative or distressing thoughts and behaviors are changed to more appropriate and positive ones, through an empirical treatment approach. According to the American Psychological Association, “Cognitive behavioral therapy focuses on the relationship among thoughts, feelings, and behaviors; targets current problems and symptoms; and focuses on changing patterns of behaviors, thoughts and feelings that lead to difficulties in functioning” (*Cognitive behavioral therapy (CBT) for treatment of PTSD* 2017). A goal of CBT is to increase a person’s self-awareness and comprehension and to help them understand how unconscious cognitive processes lead to symptoms of PTSD and distress.

Stress responses play a large role in how individuals process information and develop their reactions to situations. When a person’s behavior or emotions are out of balance, they may find themselves in unhealthy situations, feeling overwhelmed, or being unable to complete tasks in a way they normally would. Through CBT, individuals obtain the tools they need to change their thought patterns and responses, leading to more desirable outcomes.

CBT emphasizes measuring behavior and examining the thought processes that trigger certain behaviors. This approach is based on the idea that all behaviors, even if they’re harmful or unhealthy, are often motivated by unconscious or reflexive thought processes. Individuals who learn to challenge their unhealthy thoughts or assumptions may be able to positively impact changes to their behavior as a result. Someone diagnosed with PTSD who is struggling with anxiety may be taught to recognize when anxious thoughts trigger avoidance behaviors and then work to replace them with more positive coping skills. CBT also works to teach individuals how

to better manage stress levels and help ease those levels with relaxation. This may include a variety of relaxation exercises such as progressive muscle relaxation or breathing. Through CBT, clients can gain control over their emotional reactions and learn how to decrease their own anxiety.

Cognitive Behavioral Therapy clinicians strive to help their patients find a sense of self-efficacy—the belief that individuals have the power to come up with their own solutions to their problems. With the help of a trained therapist, individuals gain the skills to cope more effectively with stressful situations and can learn to develop the strategies they need to manage their thoughts and behaviors.

CBT is an effective and widely-used form of psychotherapy that has been found to be successful in treating many mental health conditions such as depression, anxiety, obsessive-compulsive disorder (OCD), and PTSD. It is a flexible approach that can be used with a wide range of individuals and is appropriate for teens and adults. CBT can be adapted to fit a variety of treatment settings and approaches, making it valuable to many types of therapy. Additionally, research suggests that CBT is both effective and efficient for many individuals and disorders. However, according to the National Library of Medicine and the National Center for Biotechnology Information, “nonresponse to CBT by PTSD can be as high as 50%, contributed to by various factors, including comorbidity and the nature of the study population” (Kar, 2011).

Overall, Cognitive Behavioral Therapy is an evidence-based approach to addressing many psychological issues. Its focus on changing thoughts and behaviors, which in turn influences emotions, is beneficial to a range of individuals. CBT has consistently been found to have positive outcomes for people suffering from a range of mental health issues. With the

assistance of a CBT-trained therapist, individuals can develop the skills to feel more in control of their thoughts and behaviors, leading to more beneficial outcomes (Barrera et al., 2013).

Dialectical Behavior Therapy

Dialectical Behavior Therapy (DBT) is an evidence-based behavioral therapy that was created by Dr. Marsha Linehan. Intended to treat severely mentally ill patients, DBT is now being used to treat individuals struggling with a variety of mental health issues including Borderline Personality Disorder (BPD) and PTSD (Borchard, 2011).

Dr. Linehan was conducting research on suicidal behavior among individuals with borderline personality disorder (BPD). Linehan initially developed DBT as a treatment for individuals with BPD and those who harm themselves. According to PsychCentral, DBT is “a modification of standard cognitive behavioral therapy (CBT), but including elements of acceptance and mindfulness” (Borchard, 2011). Dr. Linehan eventually refined her theories to include treatment for individuals diagnosed with other personality or mental health disorders. The goal of DBT is to help individuals develop coping strategies to increase their quality of life by emphasizing skill-based strategies and techniques.

According to the University of Washington’s Center for Behavioral Technology, DBT is divided into four main components: individual therapy, group skills training, telephone coaching, and therapist consultation team. The individual therapy component of DBT involves the therapist and client discussing the client’s difficulties and developing individualized strategies for dealing with them. During this component, clients are also encouraged to practice the skills they are learning in group skills training. Group skills training is designed to teach clients essential skills for dealing with their emotions, including how to accept emotions, regulate emotions, increase mindfulness, and communicate effectively. Telephone coaching is an additional component in

which the therapist and client develop strategies to apply the skills they have learned in group skills training in real-world situations. Finally, the therapist consult team is a weekly meeting in which the team of DBT therapists gather and discuss ways to improve the quality of treatment they provide to their clients. UW's Center for Behavioral Technology (year) also lists 4 stages of treatment;

The goal of Stage 1 is for the client to move from being out of control to achieving behavioral control... The goal of Stage 2 is to help the client move from a state of quiet desperation to one of full emotional experiencing... The goal is that the client leads a life of ordinary happiness and unhappiness... Linehan has posited a Stage 4 specifically for clients for whom a life of ordinary happiness and unhappiness fails to meet a further goal of fulfillment or a sense of connectedness of a greater whole. In this stage, the goal of treatment is for the client to move from a sense of incompleteness towards a life that involves an ongoing capacity for experiences of joy and freedom. (para., 6)

Eye Movement Desensitization and Reprocessing

Eye Movement Desensitization and Reprocessing (EMDR) is a psychotherapy technique that has been used since the 1990s to effectively treat symptoms of PTSD. (Shapiro, 2014, p71-77). This treatment method uses bilateral stimulation to facilitate the rapid processing of traumatic memories, so that the patient can eventually manage stress and decrease, or eventually resolve, the distressing symptoms of PTSD. Bilateral stimulation refers to a stimulus that is presented to both sides of the body (Mazzei, 2022). Most commonly, the bilateral stimulation occurs by guiding eye movements with a visual stimulus from one side of a person's vision to another which using talk therapy.

The theory behind EMDR is based on the theory of Adaptive Information Processing, which suggests that traumatic memories are stored in the memory network in an unprocessed, or unhelpful, form (Hill, 2020). EMDR activates the brain's neurobiological systems, which ultimately allows the brain to access, process, and realize the emotional, physical, and psychological distress associated with the traumatic event(s) quicker than usual. Therefore, EMDR can help to diminish the symptoms of PTSD as it provides a new beneficial perspective and understanding of the traumatic event.

Although EMDR is a process-oriented psychological therapy, it is not like traditional talk therapy. EMDR incorporates components of cognitive-behavioral therapy, but generally requires only 3 to 8 sessions of treatment on average (some clients may need more or less) and does not rely on analyzing the past. Instead, EMDR helps the patient focus on the present and future, and to gain control of their life, feelings, and experiences as they make sense of their trauma from a new, and improved, perspective.

In the clinical setting, EMDR is conducted by a trained mental health professional, who will use bilateral eye movements to help the patient reprocess memories related to the traumatic event (Shapiro, 2014, p. 71-77). The bilateral stimulation (visual, audio, and/or tactile) helps the patient move back and forth between their current state of being and the memories related to the traumatic event. In this way, the patient may develop a new understanding of the event, and may even develop new coping mechanisms and resilience in the future. There are several theories as to why bilateral stimulation provides such successful results. One theory is that the eye movements created during the bilateral stimulation can suppress the fear response in the brain and aid in memory processing by disconnecting the stressful emotion from the traumatic memory (Mazzei, 2022).

At the end of the session, the therapist and patient will review the progress and the patient's experience to ensure that the EMDR process was effective. The therapist may also provide relaxation techniques or some form of cognitive-behavioral therapy to further support the patient's emotional healing. In the end, EMDR has a proven effectiveness in treating PTSD, and is considered one of the most effective treatments available for resolving symptoms of post-traumatic stress and anxiety (Shapiro, 2014, p. 71-77).

Alternative Treatments

Acupuncture

Acupuncture is a traditional Chinese therapy used to treat various physical and psychological disorders. More recently, it has been studied as a possible treatment for Post-Traumatic Stress Disorder (PTSD). PTSD can lead to significant impairments in functioning and can have serious negative effects on a person's quality of life.

Research suggests that acupuncture may be an effective treatment for PTSD (Hollifield, 2011, p.769-779). Studies have shown that acupuncture may reduce symptoms of PTSD such as anxiety, nightmares, and depression. It may also improve sleep quality and reduce stress levels. There is also some evidence that acupuncture can reduce the intensity of traumatic memories.

Acupuncture works by stimulating certain points on the body with fine needles to induce a healing response (Hollifield, 2011, p.769-779). This response typically involves the release of endorphins, which help to reduce stress and anxiety. It is believed that acupuncture may work to help regulate the body's systems, which in turn may help regulate the brain's response to traumatic memories.

It is important to note that acupuncture is not a substitute for other forms of PTSD treatment, such as cognitive behavioral therapy. Instead, it should be used as an adjunct therapy

to help reduce symptoms and improve functioning. It is also important to consult with a qualified acupuncturist who is experienced in treating PTSD.

Relaxation

Relaxation is often considered to be an effective treatment for Post-Traumatic Stress Disorder (PTSD). As a type of psychotherapy, relaxation techniques can help people manage the distress associated with PTSD and improve the quality of life of those affected by this disabling disorder. Relaxation techniques can include exercising, deep-breathing exercises, progressive muscle relaxation, mindfulness, self-soothing, expressive writing, behavioral activation, distraction, and social support (Tull, 2022).

Relaxation techniques may be used to reduce the physical and psychological symptoms of PTSD. People who experience PTSD may be highly aroused, with their body in constant fight-or-flight mode. Through relaxation, individuals can recognize and accept their physical and emotional feelings to gain relief from their distress. Relaxation also helps people become more mindful of their environment, allowing them to recognize signs of danger, and responding in a more appropriate manner.

Some individuals often practice relaxation techniques like mindfulness on their own, using audio recordings or apps to help them focus in calming their breathing, body muscles, and thoughts. Focusing on deep breathing exercises by breathing from your diaphragm can improve focus and relieve stress (Tull, 2022). Different approaches can be explored to find the best approach for the individual seeking relaxation techniques specific to their own needs.

Relaxation techniques can also be used in group therapy sessions. Group therapy can provide a supportive environment for PTSD sufferers who are able to work through their experiences with the support of others. In group relaxations, participants are guided in breathing

exercises, progressive muscle relaxation, and imagery of relaxation activities. The goal of progressive muscle relaxation is to completely relax your muscles by tensing and then relaxing your muscles (Tull, 2022). This helps relieve stress and can also help relieve muscle tension. If practiced often enough, when your body begins to feel tense, this may signal the brain to begin progressive muscle relaxation automatically.

Relaxation strategies can help people with PTSD to learn positive ways to cope with symptoms, overcome fears, and take control of their suffering. Self-monitoring is another positive coping mechanism. The goal is to go about your day, but to “carefully observing and recording specific thoughts, behaviors, sensations, or emotions (Tull, 2022)”. This allows you to create awareness about yourself and your emotions, which then allows you to address those thoughts and emotions.

Through relaxation techniques, people affected by PTSD can improve their physical and psychological well-being, increasing their ability to face life's challenges and return to daily activities. Self-soothing is a good example of a grounding exercise that can help someone with PTSD calm and refocus (Tull, 2022). There are many different techniques that can be used to self-soothe including use of a weighted blanket, listening to relaxing music, aromatherapy, and using your senses to ground you. This is also a coping technique for anxiety in general.

According to Melissa Nunes-Harwitt with the University of Rochester Medical Center, this is also called Hand on Heart Anxiety Reduction. You first take long, deep breaths and place your hand on your heart. Then, there are five steps of acknowledgement:

- 1) Five things you can see.
- 2) Four things you can touch.
- 3). Three things you can hear.

4). Two things you can smell.

5). One thing you can taste. (Smith, 2018)

Expressive writing, or journaling, is another beneficial technique for coping with PTSD (Tull, 2022). It has been proved to reduce PTSD symptoms like anger and tension and help sufferers cope. According to Tull, it also helps with what he calls post-traumatic growth “the ability to find meaning in and have positive life changes following a traumatic event” (Tull, 2022).

Behavioral activation is a relaxation technique that can help reduce anxiety by creating a list of rewarding activities and setting goals for how many of those you would like to complete in a week (Tull, 2022). This increases the sufferers’ activity level and engagement, reducing symptoms of depression and increasing physical activity.

Meditation

Meditation has become increasingly popular as a treatment for PTSD. People with PTSD may be able to use meditation to help reduce the symptoms of the disorder (Gallegos et al., 2017, p115-124). Meditation is a mental exercise that involves focusing on your breath, an object, or a certain phrase in order to relax the body and mind and to bring you into a mindful, present state. Specific techniques of meditation used for treating PTSD may include focusing on particular body part, like how your feet feel resting on the floor, or feeling a sense of inner calm, such as using mantras or guided imagery.

Studies have suggested that meditation can reduce the symptoms associated with PTSD. It can help to quiet the mind, reduce anxiety, and decrease the intensity of flashbacks or nightmares. Additionally, it can help to build resilience and enable people to regulate their emotions and responses more effectively. In 2013, there was a pilot study done on veterans with

PTSD and a specific meditation technique, loving-kindness meditation, also known as metta. This meditation technique was designed to create feelings of kindness and care for the participants and others around them by using repetitive kindness phrases. The study found that this form of meditation decreased feelings of depression and other PTSD symptoms and increased mindfulness and self-compassion, even when measured three months later (Kearney, 2013).

In addition to the physical benefits of meditation, it can also help to create a sense of safety and help one feel grounded and calm. People can use meditation in combination with mindfulness to acknowledge and validate their experiences and emotions by finding self-compassion, which can be beneficial for those suffering from PTSD.

Overall, meditation can be an effective tool for managing the symptoms of PTSD (Gallegos et al., 2017). However, it should be used in combination with other strategies and interventions that are recommended by a mental health professional.

Medication

There are a wide range of medications available that can be used to help manage the symptoms of PTSD, but determining the most effective treatment plan requires individual assessment of the patient. The most commonly used medications to treat PTSD are antidepressants, but antipsychotics are used in some cases (Adetunji et al., 2005).

Antidepressants are commonly prescribed to treat clinical depression, but they can also be used to help manage the symptoms of PTSD, such as intrusive thoughts, avoidance, and hypervigilance. Antidepressants work by altering the levels of neurotransmitters like serotonin, dopamine, and norepinephrine in the brain, which can help to reduce symptoms of depression and anxiety (NHS24, 2023).

Different types of antidepressants have been used to treat PTSD, including selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), and monoamine oxidase inhibitors (MAOIs) (Jeffreys, 2014). SSRIs are the most commonly used antidepressants for PTSD and have been found to be effective in reducing symptoms, including intrusive thoughts, avoidance, and general anxiety. The four different SSRIs/SNRIs recommended for PTSD are Sertraline (Zoloft), Paroxetine (Paxil), Fluoxetine (Prozac), and Venlafaxine (Effecor) (Jeffreys, 2014, para. 4).

Antipsychotics are medications commonly used to treat psychotic illnesses such as schizophrenia and mania, but these medications may also be used to treat PTSD (Jeffreys, 2014). While antipsychotics are not FDA-approved for the treatment of PTSD, recent studies suggest that these medications may be beneficial for individuals suffering from the disorder. Antipsychotics are thought to decrease symptoms of anxiety, agitation, and irritability by blocking dopamine receptors and decreasing levels of the neurotransmitter associated with these symptoms.

Common antipsychotics that have been studied for the treatment of PTSD include aripiprazole (Abilify), quetiapine (Seroquel) risperidone (Risperdal), and olanzapine (Zyprexa) (Connell et al., 2013). Studies have shown that patients with PTSD have reported lower levels of anxiety and depressive symptoms, fewer intrusive memories, fewer flashbacks, and improved sleep. They may also exhibit less aggression and explosive episodes.

“When symptoms are very severe and exist with disorganized behavior and marked dissociative symptoms, low-dose atypical antipsychotic medication can be used adjunctively to the standard treatment. They may also be useful when targeted symptoms include explosiveness, aggression, and violent behavior” (Adetunji et al., 2005, p. 46).

The use of medications to treat PTSD can be an effective method of managing its symptoms. SSRIs, other types of antidepressants, and antipsychotics can be useful for reducing the frequency and intensity of symptoms and preventing relapses. However, medications should always be used in conjunction with other types of therapies, such as CBT and EMDR. An individual assessment of each patient is necessary to determine the best possible treatment strategy.

Comorbid Conditions of PTSD

There are many other mental health conditions/disorders that commonly occur alongside PTSD. Studies show that comorbidity can have a significant effect on the course and outcome of PTSD. A patient with comorbid conditions may have more severe symptoms, symptoms that last longer, and have a decrease in positive treatment outcomes (Sheppard, 2022).

Major Depressive Disorder

Major depressive disorder (and other levels of depressions) is one of the most common comorbid conditions associated with PTSD. “Approximately half of people with post-traumatic stress disorder (PTSD) also suffer from Major Depressive Disorder (MDD)” (Flory & Yehuda, 2015, para. 1). This disorder can increase the severity of PTSD symptoms and hamper an individual’s progress in recovery. Depression can lead to feelings of despair, lethargy, and low self-esteem. Individuals with comorbid PTSD and depression are more likely to struggle with interpersonal relationships and have difficulties in social or occupational functioning.

MDD’s effects can range from mild to severe (Flory & Yehuda, 2015). Mild cases may lead varying levels of distress, resulting in a negative effect on mood or functioning. Severe cases may impact everyday functioning and cause changes in behavior. Patients may also experience reduced cognition, increased risk of suicide, and other mental health conditions, often

developing in association with the patient's depressive state, such as obsessive-compulsive disorder, anxiety disorders, and eating disorders (Bains, 2023).

The etiology of MDD is still partially unknown, although research has identified certain risk factors associated with MDD, including genetic vulnerability, early-life stress, childhood trauma, or adjustment of life situations (Bains, 2023). Comorbid medical conditions like cardiovascular diseases, obesity, chronic pain, and obesity are also believed to contribute to MDD. Additionally, exposure to violence and abuse can increase the risk of developing MDD.

The most common treatments for MDD are psychotherapy and medication, although some patients may opt for other forms of treatment, such as electroconvulsive therapy (ECT) or transcranial magnetic stimulation (TMS) (Bains, 2023). Psychological treatments include cognitive-behavioral therapy (CBT), interpersonal therapy (IPT), and dynamic psychotherapy. The primary aim of such treatments is to reduce symptoms, teach problem-solving skills, and help the patient to process their feelings, thoughts, and behavior.

In addition to psychological treatments, antidepressant medications are often prescribed to treat MDD. Monoamine oxidase inhibitors (MAOIs), serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) are commonly used to treat MDD (Bains, 2023). While medication can help manage symptoms of MDD, they also come with their own set of potential side-effects, including nausea, headaches, weight gain, and risk of sexual dysfunction.

Anxiety Disorders

Anxiety disorders are also commonly comorbid with PTSD. These disorders include generalized anxiety disorder, panic disorder, and social anxiety disorder (SAD). These disorders can lead to an increased sense of fear, worry, and avoidance of certain situations or activities.

Individuals with comorbid PTSD and anxiety disorders may develop phobias as a result of the trauma (Sheppard, 2022) and are at an increased risk for suicide.

Generalized anxiety disorder (GAD) and post-traumatic stress disorder (PTSD) have been found to have a high rate of comorbidity because, just as exposure to a traumatic event can result in PTSD, it can also produce GAD (Przeworski & Dunbeck, 2016). The comorbidity of GAD and PTSD is also associated with certain personality characteristics, such as negative thinking, introversion, and a high degree of sensitivity to stress. In the case of comorbidity between PTSD and GAD, the shared environmental factor is exposure to a traumatic event. One shared symptom that can manifest from GAD and PTSD is a negative view of the patients self, including self-blame, and a negative view of the world. In particular, considerable research documents that cognitions about one's incompetence and inadequacy (negative thoughts about the self), the dangerousness and unpredictability of the world (negative thoughts about the world), and self-blame are common in the aftermath of a traumatic event (Beck et al., 2015).

Social anxiety disorder (SAD) is a type of anxiety disorder that is associated with intense fear, avoidance, and distress while interacting with other people. “An estimated 3.2% to 16% of people living with social anxiety disorder also experience PTSD. If a person’s primary diagnosis is PTSD, the co-occurrence of social anxiety disorder increases to about 43%.” (Lovering, 2022, para. 5). The comorbidity of PTSD and social anxiety disorder can have a major impact on an individual’s everyday life and can lead to difficulties in relationships and work. They may avoid social settings altogether, or they may have extreme difficulties when it comes to communicating and forming relationships. Additionally, the fear and avoidance that is associated with social phobia can cause an individual to become isolated and depressed.

Personality Disorders

Personality disorders are also commonly comorbid with PTSD. These disorders include borderline personality disorder, narcissistic personality disorder, and antisocial personality disorder. Individuals with these disorders experience difficulties with interpersonal functioning, have difficulty regulating emotions, and often engage in reckless and impulsive behaviors. Borderline personality disorder (BPD) is one of the most commonly comorbid disorders, with a comorbidity rate of between 25% and 60% (Tull, 2020).

According to the National Institute of Mental Health (NIH), people with BPD experience extreme emotions that can often change rapidly and without warning. These feelings may range from extreme sadness to extreme excitement or aggression. These emotions can fluctuate quickly and often cycle from one extreme to the other, making it difficult for people to keep up with their own feelings and with interactions with other people. Like in PTSD, those with BPD can also have reoccurring thoughts of suicide, often as intrusive thoughts (U.S. Department of Health and Human Services, para. 2).

People with BPD also have difficulty controlling their impulses. This can lead them to act recklessly or take risks, like engaging in self-harming behaviors. Other impulsive behaviors like drug and alcohol use, reckless driving, and overspending are all common for people with BPD. BPD may also cause an intense fear of abandonment. This fear of abandonment can manifest itself in a number of ways, from avoiding relationships to being overly clingy and dependent on others. People with BPD often have a distorted view of reality and often have difficulty separating their own reality from the reality of those around them and can have a distorted sense of self, (U.S. Department of Health and Human Services, para. 2).

Narcissistic Personality Disorder (NPD) is a mental health condition characterized by an inflated sense of self-importance, an excessive need for admiration, and a lack of empathy for

others (Mayo Clinic Staff, 2023a, para 5). People with NPD often believe they are better than everyone else and deserve special treatment and attention. At the core of NPD is an extreme need for admiration and validation. People with this disorder often think of themselves as superior and special, while others are either inferior or non-existent. People with NPD tend to be excessively preoccupied with fantasies of power, success, beauty, or ideal love. They may take part in activities that draw attention to them, such as dressing provocatively or behaving in a dramatic manner. They may also be extremely sensitive to criticism and often respond quite angrily when confronted. Other signs and symptoms of NPD may include arrogant, bragging behavior; expecting special favors without question; avoidance of situations in which they might fail; anger when they don't receive special treatment or recognition (Mayo Clinic Staff, 2023a, para. 5). People with NPD may also have difficulty handling criticism, as they may become easily defensive and angered when their accomplishments or views are challenged. In some cases, they may try to exploit and manipulate others.

Anti-social personality disorder is a mental health condition in which an individual has a long-term pattern of manipulating, exploiting, or violating the rights of others. People with this disorder often lack empathy and disregard the feelings of others. They may repeatedly lie, act impulsively, and behave irresponsibly without considering the consequences, including breaking the law and engaging in aggressive behavior (Mayo Clinic Staff, 2023). Individuals with anti-social personality disorder often come across as charming at first, but may present an abrasive, callous attitude with time. They may engage in risky behaviors such as substance abuse, gambling, criminality, and promiscuity. They may also have difficulty maintaining relationships or jobs for a long period of time due to their disruptive behavior. The cause of anti-social

personality disorder is not known, but it is believed that it is strongly influenced by genetics as well as environmental factors.

Although antisocial personality disorder has no treatment, some symptoms like criminal behavior may decrease as they get older. “It's not clear whether this decrease is a result of the effect aging has on their mind and body, an increased awareness of the impact that antisocial behavior has had on their life, or other factors’ (Mayo Clinic Staff, Feb 2023, para. 5).

Untreated PTSD

We hope that when a person experiences symptoms of PTSD, they will seek out medical help to help them cope and manage the effects of PTSD. However, many people with symptoms choose not to seek help and feel as if they have to deal with symptoms on their own. If PTSD goes untreated, the psychological, emotional, and physical effects can last for a lifetime and cause a great deal of distress. “There are emerging findings showing that PTSD is related to reduced somatic health as well as evidence linking inflammation with disease outcomes in this group, such as heart diseases and early mortality, regardless of age, gender or conventional risk factors.” (von Majewski et al.,2023)

One of the most prominent effects letting PTSD go untreated is an increased risk of mental health conditions. Those who experience PTSD, but do not seek treatment, are more likely to develop other mental health issues such as depression, suicidal thoughts, substance abuse disorder, panic attacks, and paranoia. Left untreated, PTSD can become a chronic lifelong disorder that slowly deteriorates one’s quality of life, making it harder for them to live a normal lifestyle and maintain relationships. “Along with severe depression and anxiety, other serious outcomes may include: increased suicidal ideation and problems managing anger and aggression (What happens if PTSD goes untreated? 2022).

In addition, not treating PTSD can also result in physical effects. Physical symptoms associated with PTSD, include headaches, nausea, muscle tension, increased heart rate, rapid breathing, and insomnia/excessive sleeping. “Physical comorbidities such as obesity, diabetes, and metabolic syndrome are common in people living with PTSD (*What happens if PTSD goes untreated?* 2022). As these symptoms worsen, individuals may find themselves more fatigued, leading to a decrease in productivity and the feeling of being drained and emotionally exhausted. As such, an important point to note is that even without physical injury, people who have gone through a traumatic event can have physical consequences as a result of PTSD. “Several studies have shown that people living with PTSD have significantly elevated levels of inflammatory markers in their blood. Increased inflammation can also affect cognitive function, and PTSD is associated with impaired verbal memory/learning, working memory, attention, and executive functions” (*What happens if PTSD goes untreated?* 2022).

Untreated PTSD can also lead to feelings of isolation and hopelessness. These feelings can cause people to distance themselves, avoiding activities and situations that could be deemed as risky and terrifying. These feelings can interfere with day-to-day activities and prevent individuals from being able to lead a normal, full life without intervention.

Prevalence of PTSD in United States Veterans

PTSD is a very real yet often misdiagnosed issue among U.S. Veterans. Judkins et al. (2020), estimates suggest that PTSD is very common among returning veterans and affect an estimated 2-12% of veterans who have been deployed in a combat zone during their military career (p. 996). This means that PTSD is the second most frequently diagnosed mental health disorder, after major depression, among US veterans. It is also suggested that the actual number of veterans being affected by PTSD is even higher as many veterans are not comfortable

disclosing their symptoms or are not properly diagnosed due to a lack of awareness or access to treatment.

Despite the prevalence of PTSD among US veterans, many do not seek treatment due to stigma surrounding mental health, a lack of awareness and education about the disorder, and even the belief that nothing is wrong with them (Undersea Warriors, 2021). This can lead to veterans feeling reluctant to receive help from mental health professionals or to seek other available services to address the symptoms of their PTSD. Additionally, many veterans feel shame and guilt for their traumatic experiences or feel that they are not deserving of help due to their perceived personal failure to protect their fellow service members or to uphold their commitment to their military.

Prevalence of PTSD in Rape Victims

Studies have shown that approximately 75 % of rape survivors have PTSD (Dworkin et al., 2021). According to Kilpatrick and Amstadter (2007), “an epidemiological survey of 4008 women, found the lifetime prevalence of PTSD resulting from rape and sexual assault to be 32% and 30.8%, respectively, compared with a prevalence of 9.4% caused by non- crime-related trauma” (para. 8). It is a common reaction that can be affected by many factors such as prior life experiences, the severity of the event, and one's access to support resources. People with PTSD may experience persistent fear, flashbacks, nightmares, difficulty sleeping, and social isolation and rape victims are no exception.

The effects of rape are not limited to those who have experienced it; family and friends can be affected as well. In addition to the emotional impact, rape can also lead to physical injury and sexual transmitted infections. The survivors may also face financial difficulties due to lost wages and medical bills. The costs associated with PTSD in survivors of rape can be significant.

The effects of PTSD can include lost productivity, lost wages, medical expenses, and psychological trauma. A 2014 study found that the direct medical costs associated with rape-related PTSD were estimated to be over \$1 billion in 2010 (Bocinski & Dusenbery, 2017). This is a large cost to society and can lead to long-term negative effects for both the survivor and those close to them.

Approximately 60% of rape victims choose not to report the crime (Bocinski & Dusenbery, 2017, para. 7). Many rape survivors are reluctant to seek assistance, either because of fear of retribution by the perpetrator, fear of being judged, or the stigma associated with the event. Unfortunately, this can lead to a state of hyperarousal, where the rape survivor is constantly in fear and on high alert, often leading to PTSD.

It is important to recognize that PTSD is a real and treatable condition for those who have experienced rape. While some individuals may struggle for months or even years with PTSD, treatment can help people learn to cope and heal from their trauma. If you or a loved one has experienced rape, it is important to seek help and support from experienced professionals who can help you cope with the trauma and get on the path to healing.

Drugs used to relieve PTSD symptoms

According to the U.S. Food & Drug Administration, a drug is a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease or used to otherwise enhance physical or mental welfare (Center for Drug Evaluation and Research, 2017). SSRIs, MAOIs, and antipsychotics are commonly used to medicate PTSD symptoms. However, many people with PTSD use illegal and un-prescribed drugs to treat themselves. Many people turn to drugs like alcohol, marijuana (THC), opioids, or psychedelics like, lysergic acid diethylamide (LSD), N, N-Dimethyltryptamine (DMT), psilocybin, ketamine, and mescaline.

Drugs effect on brain chemistry with PTSD

The effects of drugs on the brain of someone with PTSD are complex, and require a comprehensive approach that takes into account both the biological and psychological aspects of the disorder. Some drugs can help some of the symptoms of PTSD, including anxiety, depression, and intrusive thoughts or memories, while potentially leading to other disruptive symptoms such as impulsiveness or disinterest. According to Dworkin et al. (2018), “When comparing alcohol and drug use disorders, avoidance symptoms were elevated in those with alcohol use disorder, and hyperarousal symptoms were elevated in those who had a drug use disorder” (p. 189). It is important to know and understand the all aspects and side effects of any treatment, as the wrong medication can ultimately be more detrimental than beneficial.

To begin with, it is important to understand the biological aspects associated with PTSD, and the role that drugs can play in managing these symptoms. Many individuals with PTSD have misfiring sympathetic nervous systems, meaning they experience periods of extreme distress, fear, and panic when confronted with a perceived danger (Davis, 2021). “Increasing PTSD symptom severity is linked to increasing resting HR, greater impairment of arterial BRS, higher levels of inflammation and exaggerated reductions in parasympathetic activity during mental stress” (Fonkoue et al., 2019, para. 1). In situations like this, drugs that are sedative-hypnotic, or drugs used to help sleep, can have a positive effect, particularly in cases of acute stress and trauma. These drugs help the person to manage their fear reactions in a safer, more regulated manner, allowing them to regain a sense of control over their emotions and symptoms.

On the psychological side, drugs can also help to reduce the occurrence of intrusive thoughts that are often associated with PTSD. Antidepressants such as SSRIs have been shown to have a variety of different effects, including reducing the intensity and duration of these

intrusive thoughts. However, another important factor to consider is that some drugs can interfere with the cognitive tools that are important in reducing the overall impact of trauma, such as cognitive-behavioral therapy. Drugs that target serotonin, such as SSRIs, can be less effective when taken in combination with CBT, as the chemical balance that the drug is trying to manage can be disrupted by the coping strategies being used in CBT.

According to the Mayo Clinic (2019), selective serotonin reuptake inhibitors (SSRIs) work by changing the balance of natural chemicals in the brain (para. 3). Specifically, SSRIs increase the level of serotonin, a chemical messenger that acts on various parts of the brain, by blocking the absorption of serotonin back into the nerve cells that released it, also called serotonin reuptake (Mayo Clinic Staff, 2019, para. 4). This increases the amount of serotonin that is available to other cells, which improves communication between nerve cells and other parts of the brain. As a result, mood improves and symptoms of depression, such as feelings of sadness and low energy levels, are reduced.

While SSRI medications can be effective in treating the symptoms of depression and anxiety, they can also have some significant side effects. Common side effects of SSRIs include headache, nausea, difficulty sleeping, irritability, decreased libido, anxiety, dizziness, and dry mouth (Mayo Clinic Staff, 2019, para. 9). More serious side effects may include an increased risk of suicidal thoughts and behaviors in young adults, especially when taken in combination with other antidepressants or medications (Mayo Clinic Staff, 2019, para 18). Some people may also experience withdrawal effects after stopping SSRIs, including dizziness, flu-like symptoms, anxiety, and agitation (Mayo Clinic Staff, 2019, para. 21).

MAOIs are a type of antidepressant that affects the brain by increasing the availability of certain neurotransmitters. This is achieved by blocking the activity of the enzyme monoamine

oxidase, which is responsible for breaking down neurotransmitters (Mayo Clinic Staff, 2019a, para. 5). By doing so, MAOIs can increase levels of serotonin, norepinephrine, and dopamine. These actions can have positive effects on mood and emotions, such as improved energy levels, improved concentration, and increased appetite. Long-term effects can include an increase in overall well-being and a decrease in depression and anxiety symptoms.

MAOIs (monoamine oxidase inhibitors) can produce a number of side effects, including dry mouth, dizziness, trouble sleeping, nausea, low blood pressure, weight gain, muscle cramps, involuntary muscle jerks, and headaches (Mayo Clinic Staff, 2019a, para.10). MAOIs also interact with several other types of drugs, including some over-the-counter and herbal medicines, which can lead to dangerous interactions. Additionally, taking MAOIs can increase the feelings of depression, and even cause suicidal thoughts and feelings in some people (Mayo Clinic Staff, 2019a, para. 13).

Tricyclic antidepressants (TCAs) are a class of antidepressants that were among the earliest medications prescribed for depression in the 1950s. TCAs work by blocking reabsorption of naturally occurring neurotransmitters, like serotonin and norepinephrine, in the brain (Mayo Clinic Staff, 2022, para. 5). They block certain brain receptors that play a role in reabsorbing serotonin and norepinephrine, which increases the amount of these neurotransmitters available to the brain. By doing this, TCAs can improve a person's mood and help alleviate depression. They may also help to regulate certain hormones and reduce tension headaches, fatigue, pain, and anxiety.

The use of Tricyclic Antidepressants (TCAs) can lead to a variety of side effects such as dry mouth, constipation, blurred vision, dizziness, drop in blood pressure when moving, difficulty urinating, excessive sweating, and tremors (Mayo Clinic Staff, 2022, para. 9). In

addition to these physical side effects, TCAs can also cause psychological problems such as anxiety, insomnia, and increased agitation. Furthermore, some patients may develop a tolerance to the drug with time, also called breakthrough depression, leading to a need for higher doses to achieve the same effect (Nestadt, 2021).

Antipsychotics work in the brain by affecting the way that the neurotransmitters dopamine and serotonin are released and accepted by certain cells in the brain (Kapur et al., 2006). When these neurotransmitters interact, they control various brain functions, such as emotions, cognition, and movement. By regulating the way, they interact, antipsychotics are able to reduce the intensity of symptoms associated with PTSD and other mental disorders (Kapur et al., 2006). In some cases, the drugs may also help improve cognition, though this is not always the case. Antipsychotics help to stabilize a person's mental health by regulating the way these neurotransmitters affect the brain.

Side effects of antipsychotics include body temperature problems, drowsiness, liver disorders, heart problems, blood disorders, eye problems, seizures, skin problems, and weight gain (Mind Staff, 2020, para. 2). There are also serious long-term side effects, including an increased risk of stroke, tardive dyskinesia (involuntary movements), and an increased risk of death in older people taking antipsychotics. People taking antipsychotics should be monitored closely for any changes in their physical or mental health.

Some drugs can also often help to improve the overall quality of life in individuals with PTSD. Many anticonvulsants, antipsychotics, and mood stabilizers have been found to reduce the severity of PTSD symptoms, helping the individual to better manage situations and emotions. "Long-term treatment of PTSD with SSRIs improves the psychiatric and clinical outcome of patients with the disorder" (Davis et al., 2006, p. 465). Similarly, anxiety medications can help to

reduce the severity of the person's fear reactions to triggers, which helps prevent or lessen their symptoms.

Ultimately, the effects of drugs on the brain of someone suffering from PTSD are varied and complex. The effects and implications of any treatment program must be thoughtfully considered and discussed with a mental health professional in order to ensure the most effective approach is taken. By understanding the different intricacies involved with drugs, the risks and potential benefits of treatment can be more effectively assessed and managed. In this way, individuals struggling with PTSD can find relief, comfort, and a sense of control in the face of their trauma.

Alcohol as self-treatment of PTSD

Alcohol has long been known to be used as a form of self-medication in people with post-traumatic stress disorder. Despite its calming effect, long-term use of alcohol as a treatment for PTSD is controversial and not recommended by many experts in the mental health field. Nevertheless, some people with PTSD may be attracted to using alcohol as a form of self-medication, which has both positive and negative effects.

When taken in reasonable amounts, alcohol can increase a patient's ability to disassociate and decrease anxiety. This is especially true for people with PTSD, who are often overwhelmed by the persistent intrusive thoughts and memories of their trauma. Unlike pharmaceutical drugs, alcohol is relatively inexpensive and easy to obtain, and can therefore be used in situations where someone is feeling overwhelmed by their PTSD symptoms.

Alcohol use is not recommended overall for treatment of PTSD symptoms in part because alcohol is a depressant. This means that it can increase fatigue and intensify unwanted emotions, such as sadness, anger, and irritability. Using too much alcohol can actually make it more

difficult to cope with trauma and symptoms of PTSD (U.S. Department of Veterans Affairs, 2007). In addition, alcohol use can also increase the likelihood of engaging in reckless or dangerous behavior. This is of particular concern for people with PTSD, who may be struggling with anger management issues or a lack of impulse control. Drinking can also increase suicidal thoughts or self-harm. It can also lead to Alcohol Use Disorder (AUD). “Veterans of the Iraq and Afghanistan wars who had PTSD were twice as likely to report alcohol misuse as those with no PTSD. More than 28% of veterans screened positive for alcohol misuse, and 37% screened positive for PTSD. Of those who met criteria for PTSD, 76% had co-occurring depression, which was more than twice the rate of depression among veterans who did not have PTSD” (Blanco, 2011, p. 51).

Chronic alcohol use has also been linked to an increase in a person’s PTSD symptoms (U.S. Department of Veterans Affairs, 2007). Research suggests that long-term abuse of alcohol can worsen intrusive thoughts, increase agitation, reduce self-esteem, and interfere with the ability to process emotion. This type of drinking can also interfere with important aspects of recovery, such as joining support groups or having access to professional treatment. The bottom line is that while alcohol may provide temporary relief from symptoms of PTSD, it is not a long-term solution.

Cannabis as a treatment for PTSD

Marijuana has been used for medicinal purposes for many years and its potential to treat post-traumatic stress disorder, or PTSD, has been studied as part of this application. According to Abizaid et al. (2019), research is ongoing, but so far studies suggest that marijuana has the potential to be an effective treatment for PTSD and its associated symptoms. There are many

potential positive effects of marijuana treatment for PTSD, and marijuana has potential for further use in treating PTSD.

One of the most significant potential positive effects of marijuana treatment for PTSD is its ability to reduce anxiety. Anxiety is a common symptom of PTSD, as individuals who have experienced traumatic events often experience heightened feelings of fear and stress even after the event has passed. According to Hill et al. (2018), Marijuana has been shown to reduce anxiety by directly affecting the brain's endocannabinoid system. This system affects multiple physiological processes including pain relief, memory, and mood. By stimulating receptors in this system, marijuana can reduce anxiety and even lead to significant improvements in PTSD symptom severity.

Marijuana may also be beneficial for PTSD patients who struggle with nightmares. Nightmares and other intrusive memories are common side effects of PTSD, but marijuana can reduce the frequency and intensity of these occurrences. This is especially true of marijuana extracts such as CBD oil, which is a non-psychoactive substance. According to Elms et al. (2019) CBD can significantly reduce the frequency of nightmares in PTSD patients, making it an appealing alternative to traditional treatments.

Marijuana also appears to be effective in reducing hyperarousal in patients with PTSD. Hyperarousal affects the body's ability to regulate its stress level, leading to excessive fear and anxiety even in non-threatening situations. Studies have found that marijuana is effective in reducing physiological symptoms of hyperarousal such as elevated heart rate, increased respiration, and increased muscle tension (Nacasch et. al., 2023).

At this time, there is not enough evidence to definitively state that marijuana is effective in treating PTSD. However, the potential positive effects of marijuana treatment for PTSD are

promising. Further research is needed to determine the specific benefits of marijuana for PTSD patients, as well as the potential risks and side effects associated with its use. Despite this, current evidence supports marijuana as a possible treatment option for individuals with PTSD.

Opioids as a Treatment for PTSD

Opioids are often used as a treatment for PTSD. Opioids are a powerful type of medication often prescribed for severe pain and are classified as narcotic drugs (Chou et al., 2009). They are derived from the opium plant and include drugs such as morphine and codeine. Although opioids can have powerful effects on reducing chronic pain and providing relief for terminal conditions, there is ongoing debate as to their effectiveness in treating PTSD and if the potential risks of taking them outweigh the benefits.

Opioids work by binding to opioid receptors in the brain, spinal cord and digestive tract, leading to changes in how the body perceives and responds to pain (National Institute of Health, 2023). Opioids have a direct depressant effect on the central nervous system and have the ability to alter aspects of perception, pain, emotions, and behavior. When opiates bind to these receptors, they quickly reduce the amount of pain signals one can feel and thus reduce the amount of pain overall (National Institute of Health, 2023). Additionally, the effects of opioid drugs on the brain also induce a sense of pleasure and relaxation.

The use of opioids can often result in several side effects. These can range from mild to severe and can include constipation, nausea, and drowsiness (National Institute of Health, 2023). Long-term use of opioids can also lead to further side effects such as slowed breathing resulting in hypoxia, fatigue, confusion, euphoria, and addiction. In addition, opioids in high doses can further increase the likelihood of severe side effects such as respiratory depression, coma, and in some rare cases, death.

Opioids have been the focus of recent controversy in relation to the treatment of PTSD due to potential risks of dependence and tolerance. Opioids can cause physical dependence, which occurs when the body needs to increase doses to achieve the same level of pain relief. As the drug interacts with the brain's natural opioid systems, there is a risk of developing an addiction or tolerance. Chou et al. (2009) found that long-term opioid use has also been linked to a range of other side-effects including constipation, nausea, confusion, and depression.

Despite the risks and potential long-term health impacts of taking opioids, there is some evidence that they can be beneficial in treating PTSD. One study by Bryant et al. (2009) looking at the use of morphine in treatment of acute pain and PTSD showed that the administration of morphine reduced the severity of PTSD. Similarly, another study by Holbrook et al. (2010) soldiers with chronic pain complicated by PTSD found that opioid use successfully reduced the symptoms of PTSD.

Overall, the use of opioids in treating PTSD is controversial and must be thoroughly considered on an individual basis. The high risk of addiction and tolerance associated with opioids must be weighed against the potential benefits of pain relief and improved management of PTSD symptoms (Chou et al., 2009). It is important to note that opioids should only be used in combination with psychotherapy and other treatments to reduce the risk of addiction and tolerance.

Psychedelics as a treatment for PTSD

Psychedelics have become a topic of interest recently due to the growing evidence of their potential therapeutic benefits (Krediet et al., 2020). One area where psychedelics have shown promise is in the treatment of post-traumatic stress disorder (PTSD). Several recent studies have investigated the use of psychedelic drugs, such as lysergic acid diethylamide (LSD),

N,N-Dimethyltryptamine (DMT), psilocybin, ketamine, and mescaline to treat symptoms of PTSD.

LSD

The use of lysergic acid diethylamide (LSD) and other psychedelics, for treating PTSD is a controversial topic (Krediet et al., 2020). Nonetheless, recent evidence from clinical trials has shown that LSD may be a valuable tool in helping those suffering from the disorder.

LSD is a psychoactive drug that works by interacting with serotonin receptors in the brain and binding to the receptor to force it through one of two specific pathways in the brain (National Institute of Health, 2017). Serotonin receptors in the brain are responsible for regulating mood, cognition, and perception. This can lead to changes in behavior, thought patterns, and an altered sense of reality.

The mesolimbic dopamine system is responsible for reward and pleasure. When LSD interacts with this system, it sends out signals of pleasure that may lead to an increased sense of sensory, emotional, and spiritual awareness. This interaction can also exaggerate the effects of other drugs, including marijuana and alcohol, leading to further changes in consciousness, and potentially causing hallucinations, changes in perception, and altered states of awareness (Serafini et al., 2020). LSD also binds to serotonin receptors in the brain, which are responsible for regulating mood, cognition, and perception. This can lead to changes in behavior, thought patterns, and an altered sense of reality.

LSD can produce adverse side-effects that can diminish a person's ability to function. The most common side effects of LSD include dilation of pupils, confusion, fast heartbeat, visual and auditory hallucinations, vomiting, euphoria, and headaches (Alcohol and Drug Foundation, 2022). In extreme cases, users may experience terrifying delusions and psychotic breaks. One of

the most dangerous potential side-effects of LSD is the risk of flashbacks, which can occur months or even years after the drug has been taken (Alcohol and Drug Foundation, 2022).

Recent clinical trials have tested the safety and effectiveness of LSD for the treatment of PTSD. While results from these trials are still limited, they generally suggest that LSD is both safe and effective in reducing symptoms of the disorder. A study by Oehen and Gasser (2022) found that LSD significantly reduced the severity of PTSD symptoms in combat veterans, and that these benefits lasted for several weeks. Additionally, another study by Gregorio et al. (2021) found that LSD combined with psychotherapy produced larger reductions in PTSD symptoms than psychotherapy alone.

The reason LSD can be used to help with symptoms of PTSD is still unclear. One explanation might be that the hallucinogenic effects of LSD induce changes in the way the brain processes memories, allowing those affected by PTSD to let go of traumatic experiences with less fear and anxiety (Gregorio et al., 2021). LSD has also been found to increase psychological openness, which may help reduce symptoms of PTSD and encourage individuals to take a more reflective approach to their traumas.

Although the potential of LSD for treating PTSD symptoms is promising, more research is needed to confirm its effectiveness and safety. For instance, larger, placebo-controlled studies are needed to investigate the effects of LSD and to identify the optimal dose for treatment. Additionally, it is important to consider the potential risks associated with LSD, including anxiety and panic reactions, perceptual distortions, dissociation, and impaired judgment (Oehen & Gasser, 2022). As with other treatment options, LSD should only be used as part of a comprehensive treatment program and should never be taken recreationally.

Overall, LSD may be a valuable tool for treating PTSD, but more evidence is needed to confirm its efficacy. Although the results from clinical trials have been positive, the risks associated with LSD use still outweigh the potential benefits. As such, it is important to consider LSD only as part of a comprehensive treatment program.

DMT

The use of Dimethyltryptamine (DMT) as a treatment for PTSD is a relatively new concept, but one that holds a great deal of promise. DMT is a naturally occurring psychedelic drug that has been used in various traditional cultures for thousands of years. Research suggests that DMT may have potential therapeutic benefits when used to treat PTSD and other mental health illnesses (Davis et al., 2020).

When DMT is ingested, it produces intense visual and auditory hallucinations as well as altered states of consciousness. The primary way that DMT works in the brain is through its action on the neurotransmitter serotonin (Davis et al., 2020). DMT binds to serotonin receptors on neurons, increasing both the amount of serotonin released and the duration of the effect of serotonin. This has the effect of stimulating visual and auditory pathways in the brain, leading to the psychedelic experience. Positive effects of DMT include an increase in mindfulness and decrease in negative symptoms like depression and stress (Davis et al., 2020). According to Davis et al., “DMT also demonstrates neuroprotective, regenerative, and anti-inflammatory properties which may prove therapeutic in addressing the underlying etiology of cognitive impairment and PTSD”. Aside from its effects on serotonin, DMT also appears to influence other neurotransmitters and brain regions, leading to its full range of psychedelic effects.

The most commonly reported effects of DMT use include changes in heart rate and blood pressure, trembling, heart palpitations, fear, anxiety, grief, guilt and sadness (Davis et al., 2020).

In rare cases, DMT has been associated with acute panic reactions resulting in hallucinations, seizures, and sleep disturbance. In the long-term, DMT use can lead to dependence, memory abnormalities, and psychotic episodes.

Psilocybin

Psilocybin is a natural compound found in some types of edible mushrooms. Researchers and physicians have begun to explore the potential benefits of psilocybin, in the treatment of PTSD. While much remains to be researched, early studies suggest that psilocybin therapy may prove to be an effective method of managing and reducing symptoms of PTSD (Gregorio et al., 2021).

When psilocybin is ingested, it can produce profound psychological effects, such as altered perception, reduced inhibitions, and feelings of openness. On a neurological level, psilocybin works by targeting the receptor sites in the brain that are responsible for serotonin (Gregorio et al., 2021). By interacting with these receptors, psilocybin can disrupt existing neural pathways and create new ones, potentially leading to greater creativity, self-exploration and a sense of connection. Psilocybin also induces increased activity in the brain's prefrontal cortex, leading to improved mood, reduced stress and enhanced mental clarity (Gregorio et al., 2021).

Some common side effects of psilocybin can include nausea, vomiting, heightened senses, and changes in visual, auditory, or tactile perception (Sellers, 2021). It can also cause confusion, paranoia, feelings of dread, and feelings of unreality. Unpleasant physical effects such as muscular weakness, lack of coordination, dilation of pupils, increased heart rate, and increased blood pressure can also occur. In some cases, people may experience psychedelic-induced "bad trips" that consists of unpleasant physical and psychological effects such as fear, panic, anxiety,

and confusion. Long-term side effects can include flashbacks, mood disturbances, and psychotic-like behavior.

Psilocybin therapy is the use of synthetic (or natural) psilocybin, a naturally occurring psychoactive compound found in some types of mushrooms, to treat medical conditions such as anxiety, depression, addiction, and PTSD. It is usually administered in the form of carefully prepared capsules or in the form of a dried powder. Through the use of a combination of psychotherapy, cognitive behavioral therapy, and interpersonal therapy, a person's reaction to psilocybin can be managed in a controlled environment (Carhart-Harris et al., 2016).

A 2016 study by Carhart-Harris et al. explored the potential effects of psilocybin treatment on the symptoms of depression in people who had previously been diagnosed with the disorder. The study, which involved the administration of psilocybin to 20 participants, found that a significant reduction in the symptoms of depression, anxiety, and anhedonia were observed in all participants after treatment, with the average reduction being approximately 75%. All three of these symptoms are highly co-morbid with PTSD. These symptoms were shown to stay reduced even three months after the administration of psilocybin. Other studies have similarly demonstrated the potential of psilocybin therapy in treating PTSD symptoms, although further research is needed to fully understand the potential efficacy of this type of treatment.

The potential benefits of psilocybin therapy in treating PTSD extend beyond simply reducing the symptoms of the disorder. In addition, psilocybin has been shown to reduce the occurrence of flashbacks, nightmares, insomnia, irrational fear, increased anxiety, and generalized distress, all of which are common symptoms of PTSD that often are resistant to more traditional treatments (Bird et al., 2021). This is especially beneficial in treating individuals who

have experienced significant trauma as the therapeutic effects of psilocybin may help them to overcome their fears and increase their sense of self-confidence.

Finally, the use of psilocybin therapy has been associated with a variety of positive psychological and spiritual benefits. In a 2015 study, participants reported that their use of psilocybin in therapy sessions led to an increased sense of spirituality and connection to nature, a heightened state of self-awareness, and a greater sense of life satisfaction, awe, and appreciation for life (Lebedev et al., 2015). These findings suggest that psilocybin therapy may be used to help individuals with PTSD to cultivate greater peace and wellbeing in their lives.

As with any type of therapy, there are potential risks associated with the use of psilocybin. Despite the potential risks, however, the current evidence suggests that psilocybin therapy shows great promise in the treatment of PTSD. The benefits of psilocybin therapy extend beyond simply reducing symptoms, and may extend to the development of spiritual and psychological elements that can increase the quality of life of individuals living with PTSD. Healthcare providers should consider including psilocybin therapy as part of an overall treatment plan in cases where it is deemed appropriate. As research into the potential of psilocybin therapy progresses, there may be an even greater understanding of the potential benefits that this type of therapy can provide.

Ketamine

Ketamine has become an increasingly popular treatment option for PTSD. The use of ketamine as a psychiatric treatment can be shown back into the 1970s (Khorramzadeh & Lotfy, 1973). It is important to note that while there is considerable evidence that ketamine has promising therapeutic benefits for PTSD patients, there is also evidence that it can increase the risk of adverse effects and further psychological and physical complications.

Ketamine works in the brain by blocking NMDA receptors, which makes it a NMDA receptor antagonist (Otto, 2022). This blocks the flow of dopamine, serotonin and glutamate which helps to reduce pain and depression, as well as to produce a dissociative effect. The exact mechanisms of its antidepressant effects are still unclear, but researchers believe it may involve a reduction in glutamate levels or a disruption of glycine receptors.

Ketamine is a general anesthetic drug which has a variety of effects on the central nervous system including anxiolytic, sedative, and potent analgesic effects. It has a mechanism of action which is quite distinct from traditional antidepressants, which works to reduce symptoms of PTSD by increasing levels of N-methyl-d-aspartate (NMDA) receptor agonist neurotransmitter glutamate in the brain (Gregorio et al., 2021). This allows for a more constructive interpretation of traumatic events and can help to reduce intrusive memories and recurrence of symptoms. In addition, ketamine can increase neuronal plasticity and neurogenesis in the hippocampus, which is essential for memory formation and emotional processing.

Studies of ketamine treatment for PTSD have generally produced favorable results. A review of a small randomized placebo-controlled study involving a total of 57 participants not only showed ketamine to be effective for both reducing symptoms of PTSD in the short-term, but also found that the effects of ketamine lasted weeks after the final dose (Feder et al., 2014). More recently, a randomized controlled study involving 30 participants showed that those treated with a single intravenous dose of ketamine reported significantly decreased severity of PTSD symptoms after a follow up (Feder et al., 2021).

Despite the evidence of possible beneficial effects of ketamine, there are also potential risks associated with its use. Ketamine may cause increased anxiety and agitation, dissociative symptoms, and impaired cognition. It can also cause impairments in certain motor skills,

including balance, coordination, and hand-eye coordination (Niesters et al., 2014). Long-term use, especially in patients who are already predisposed to addiction, can lead to a development of tolerance and dependence. In some cases, especially with higher doses, adverse psychological side effects can be severe and long lasting, leading to an increased risk of suicidal behavior as well as exacerbation of pre-existing mental health conditions.

Overall, while evidence suggests that ketamine may be a promising treatment for PTSD, there is still a lack of reliable evidence to suggest that it is a safe and effective treatment option. As research on the efficacy of ketamine for PTSD continues to grow, so too should the understanding of its potential risks and benefits.

Mescaline

Mescaline is a naturally occurring hallucinogen derived from the peyote cactus. It has been used for centuries by some cultures as part of traditional spiritual practices and as a medication (Kovacic & Somanathan, 2009). In recent years, however, mescaline has been gaining attention for its use as a potential treatment for PTSD.

Mescaline is a psychoactive drug that affects the brain through various biochemical pathways. It is a potent hallucinogen that affects the neurotransmitters in the nervous system, specifically serotonin, dopamine, and epinephrine, similar to the way that LSD and psilocybin do. It is believed that these altered states of consciousness arise from changes in neural network activity (Kovacic & Somanathan, 2009).

Mescaline has been found to increase a person's openness and willingness to discuss the memories or emotions connected to a traumatic experience with a therapist. It may also reduce the fear or pain associated with these memories, providing a supportive environment for individuals to safely explore these memories or emotions (Agin-Liebes et. al, 2021). Agin-Liebes

study found that a single mescaline experience was associated with significant reductions in PTSD symptoms, with 76% of respondents reporting improvement in mental health conditions (Vamvakopoulou et. al., 2023).

In addition, mescaline has been found to have antidepressive effects in individuals with PTSD, possibly due to its ability to reduce cortisol levels, which are elevated in people with PTSD (Vamvakopoulou et. al., 2023). This suggests that mescaline may have a therapeutic effect not just on the symptoms of PTSD, but also on the underlying biology of the disorder.

Despite the promise of mescaline and other psychedelic drugs as a potential treatment for PTSD, much more research is needed before it can be recommended for clinical use. Currently, the long-term effects of these drugs are unknown. More research is also required to find the most effective dosing frequency and quantity. Furthermore, mescaline is currently illegal in the United States, so further research into its efficacy as a treatment for PTSD faces legal hurdles.

Legal Issues

The use of illegal drugs in medical research has been an issue of debate and discussion for some time now. On one side, proponents argue that these substances have potential medicinal value and should be studied further. On the other side, opponents argue that these substances should remain illegal and never be researched due to the dangers and health risks associated with them.

The use of illegal drugs in medical research is subject to strict regulations and laws, which vary by jurisdiction. In the United States, the Food and Drug Administration (FDA) regulates the use of illegal drugs in medical research. The FDA's Investigational New Drug (IND) program is a special protocol designed to evaluate the safety and efficacy of investigational drugs for human use (Center for Drug Evaluation and Research, 2022). In order

to obtain an IND, researchers must demonstrate that the drug in question is safe and effective for human use. Furthermore, researchers must obtain approval from the FDA before conducting any clinical trials and researchers must adhere to safety protocols and recordkeeping requirements in order to ensure the safety of those participating in the trial.

In addition to the FDA, the NIH also regulates the use of illegal drugs in medical research. The NIH's Center for Disease Control and Prevention (CDC) also has guidelines for the approval and conduct of medical research using controlled substances. These guidelines require researchers to obtain approval from the Drug Enforcement Administration (DEA) as well as approval from the FDA and an Institutional Review Board (IRB) (Kaylor, 2022).

According to a study in the American Journal of Bioethics,

It is likely that several drugs currently classified under Schedule I have significant therapeutic potential for relieving symptoms and managing the underlying chronic conditions. Without research, that potential cannot be detected or verified and the potential benefits cannot be dispersed. The Catch 22 of the status quo is that the classification of drugs as Schedule I amounts to an unsurmountable barrier to research. (Andreae et. al., 2016)

The use of illegal drugs in medical research also raises some ethical issues. One of the main ethical concerns is the potential misuse or abuse of the drug. Researchers must ensure that the participants in the study are not exposed to any risks or harm associated with the drug. Furthermore, researchers must also respect the autonomy of the participant and obtain informed consent before conducting any research.

Another ethical concern associated with the use of illegal drugs in medical research is the potential for the drug's illicit use. While some proponents of using these drugs in medical

research argue that they offer potential medical benefits, there is also the potential for them to be misused or abused. For this reason, researchers must be mindful of the potential for the compassionate use of these drugs and ensure that they are being used correctly and safely.

Conclusion

There has been a great deal of research done on post-traumatic stress disorder (PTSD). This life altering mental disorder can develop after exposure to a traumatic event, or series of traumatic events. PTSD is diagnosed by a mental health professional who may use the DSM-5 criteria of a traumatic event along with the outlined criteria of PTSD. There are many traumatic events that can cause PTSD such as rape, combat, and abuse. The symptoms of PTSD can include an increased startle response, often unprompted outbursts of anger and aggression, reckless behavior, hypervigilance, and involuntary recall of the traumatic event.

Not all people with exposure to a traumatic event will develop PTSD, but there are several risk factors that can increase the likelihood of developing it. A family history of mental illness, substance abuse, and a lack of support system after a traumatic event are just a few risk factors. Other risk factors include sex, age, and race.

Unfortunately, not all people with PTSD seek treatment. The cost of treatment, time involved in treatment, stigma associated with mental health disorders, and the lack of knowledge of the condition and treatment options are a few reasons why people do not seek help. There is currently no cure for PTSD. Treatment often involves using a combination of techniques including Cognitive Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT), Eye Movement Desensitization and Reprocessing (EMDR), acupuncture, relaxation, meditation, and medication.

Most treatments for PTSD revolve around lessening the symptoms of PTSD. Cognitive Behavioral Therapy (CBT) gives patients the ability to manage stressors by changing unconscious or automated thought processes. The focus of CBT is to change certain negative thoughts and behaviors that are influenced by negative or unwanted emotions. Dialectical Behavioral Therapy (DBT) focuses on accepting, regulating, and communicating emotions successfully. Eye Movement Desensitization and Reprocessing therapy (EMDR) is very different from CBT and DBT. EMDR uses bilateral alternating external stimuli while a patient is focusing on a memory to allow the patient to reprocess a negative episodic memory. Reprocessing a traumatic event can allow a patient to make that memory less intense, thus lessening the symptoms associated with it.

Co-morbid conditions of PTSD make treatment of the condition very difficult. Nearly half of the people suffering from PTSD also report suffer from Major Depressive Disorder (MDD). MDD can make an individual have feelings of low self-esteem, despair, and lethargy. There are 2 main anxiety disorders are also co-morbid with PTSD: generalized anxiety disorder (GAD), and social anxiety disorder (SAD). GAD produces symptoms like negative thinking, introversion, and sensitivity to stress. Social anxiety disorder produces symptoms of intense fear, avoidance, and interpersonal distress.

Personality disorders that are commonly co-morbid with PTSD include borderline personality disorder (BPD), narcissistic personality disorder (NPD), and anti-social personality disorder (ASPD). People with BPD experience extreme emotions that often change rapidly. NPD is characterized by a sense of self-importance, great need of admiration, and absence of empathy for others. Patients with anti-social personality disorder tend to manipulate, exploit, and violate

the rights of others. The different co-morbid conditions of PTSD make it difficult to treat a patient with PTSD.

There are alternative treatments to PTSD like acupuncture, relaxation, and meditation. These treatments can not only alleviate the symptoms of PTSD, they have also been proven effective in alleviating symptoms of co-morbid conditions of PTSD. Acupuncture uses fine needles to stimulate certain points of the body to induce healing and can lead to relief from anxiety, nightmare, depression, and reduced stress. Relaxation techniques that have been found helpful in alleviating symptoms include mindfulness, expressive writing, deep-breathing, and exercise.

Although considered an alternative treatment, there are several meditations that have been proven to help reduce PTSD symptoms, including metta. Meditation is when an individual focuses on breathing, an object, or a phrase to relax the mind and body. This state of relaxation also increases mindfulness, which helps alleviate symptoms of anxiety and depression.

There are many medications to help relieve PTSD symptoms. The most common medications are serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), and antipsychotics. Antidepressants work by altering the amount of serotonin, dopamine and norepinephrine in the brain. Anxiety and depression symptoms of PTSD can be treated with antidepressants. Antipsychotics work very similarly to antidepressants, but decrease anxiety agitation and irritability. Antipsychotics are not FDA approved for treatment of PTSD. If PTSD is untreated it can lead to higher risk of co-morbid conditions.

People with PTSD will sometimes seek methods of relieving the symptoms on their own. The more common methods include use of alcohol, cannabis, opioids, lysergic acid diethylamide (LSD), Dimethyltryptamine (DMT), ketamine, mescaline, and psilocybin among other

substances. With the exception of alcohol all, of these substances are illegal and strict laws on the use and research of the effects of illicit drugs make it difficult to safely and accurately determine the effectiveness and importance of these substances on PTSD symptoms.

While all of these substances have proven effective in some capacity during the course of research, there are other negative side effects to consider. Alcohol can decrease anxiety and increase a person's ability to dissociate, but alcohol is a depressant that can increase depression, anger, and irritability. Opioids can be used to reduce the severity of PTSD symptoms, but they are highly addictive. LSD has been found to severely reduce the symptoms of PTSD even for weeks afterwards, but flashbacks are commonly an unfortunate side effect of LSD use. DMT can be used to decrease symptoms of depression and stress, but long-term use of DMT can cause memory problems, psychotic episodes, and dependency. Ketamine can reduce depressive symptoms and allow the reprocessing of memories, but Ketamine can also cause increased anxiety and agitation. Mescaline allows patients to open and discuss past trauma which helps reduce PTSD symptoms, but the long-term effects of mescaline use are unknown. The use of psilocybin to treat PTSD has been shown to highly reduce symptoms of PTSD and co-morbid conditions, but, like with the other illicit substances listed, there has still not been enough research conducted into its safety and efficacy to support a push to legalize the substance.

PTSD is a serious mental health condition that affects thousands. While current treatments prove effective for some, many still struggle with symptoms for this mental health disorder which currently has no cure. With several new promising avenues of treatment, researchers should continue to pursue investigating both those methods that are currently approved and those that require additional trials. Although there are legal concerns with substances like psilocybin, perhaps continued research will not only lead to a better

understanding of the drugs and their effect on the brain, but also to a better understanding of PTSD and potentially a cure for the disease.

References

- Abizaid, A., Merali, Z., & Anisman, H. (2019). Cannabis: A potential efficacious intervention for PTSD or simply snake oil? *Journal of Psychiatry and Neuroscience*, 44(2), 75+. <https://link-gale-com.ezproxy.waterfield.murraystate.edu/apps/doc/A577208709/HWRC?u=murr79496&sid=bookmark-HWRC&xid=637959ec>
- Adetunji, B., Mathews, M., Williams, A., Budur, K., Mathews, M., Mahmud, J., & Osinowo, T. (2005, April). *Use of antipsychotics in the treatment of post-traumatic stress disorder*. Psychiatry (Edgemont Township). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3004738/>
- Agin-Liebes, G., Haas, T. F., Lancelotta, R., Uthaug, M. V., Ramaekers, J. G., & Davis, A. K. (2021). Naturalistic Use of Mescaline Is Associated with Self-Reported Psychiatric Improvements and Enduring Positive Life Changes. *ACS pharmacology & translational science*, 4(2), 543–552. <https://doi.org/10.1021/acspsci.1c00018>
- Alcohol and Drug Foundation. (2022, August 26). *ADF - Drug Facts - LSD*. ADF - Alcohol & Drug Foundation. <https://adf.org.au/drug-facts/lsd/>
- American Psychiatric Association. (2020, November). *What Is PTSD?* Psychiatry.org; American Psychiatric Association. <https://www.psychiatry.org/patients-families/ptsd/what-is-ptsd>
- American Psychological Association. (2017, July 31). Cognitive behavioral therapy (CBT) for treatment of PTSD. American Psychological Association. <https://www.apa.org/ptsd-guideline/treatments/cognitive-behavioral-therapy>
- Andreae, M. H., Rhodes, E., Bourgoise, T., Carter, G. M., White, R. S., Indyk, D., Sacks, H., & Rhodes, R. (2016). An ethical exploration of barriers to research on controlled drugs. *The*

- American Journal of Bioethics: AJOB*, 16(4), 36–47.
<https://doi.org/10.1080/15265161.2016.1145282>
- Bains N, Abdijadid S. *Major Depressive Disorder*. [Updated 2023 Apr 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK559078/>
- Barrera, T. L., Mott, J. M., Hofstein, R. F., & Teng, E. J. (2013). A meta-analytic review of exposure in group cognitive behavioral therapy for posttraumatic stress disorder. *Clinical Psychology Review*, 33(1), 24–32. <https://doi.org/10.1016/j.cpr.2012.09.005>
- Blanco, C. (2011). Epidemiology of PTSD. *Post-Traumatic Stress Disorder*, 49–74. <https://doi.org/10.1002/9781119998471.ch2>
- Beck, J. G., Jones, J. M., Reich, C. M., Woodward, M. J., & Cody, M. W. (2015). Understanding the role of dysfunctional post-trauma cognitions in the co-occurrence of posttraumatic stress disorder and generalized anxiety disorder: Two trauma samples. *Behaviour Research and Therapy*, 70, 23–31. <https://doi.org/10.1016/j.brat.2015.04.011>
- Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science*, 11, 7-10.
- Bird, C. I. V., Modlin, N. L., & Rucker, J. J. H. (2021). Psilocybin and MDMA for the treatment of trauma-related psychopathology. *International Review of Psychiatry*, 33(3), 229–249. <https://doi.org/10.1080/09540261.2021.1919062>
- Bisson, J. I., Cosgrove, S., Lewis, C., & Robert, N. P. (2015). Post-traumatic stress disorder. *BMJ (Clinical research ed.)*, 351, h6161. <https://doi.org/10.1136/bmj.h6161>
- Bocinski, S. G., & Dusenbery, M. (2017, June 28). The financial cost of rape. Institute for Women’s Policy Research. <https://iwpr.org/the-financial-cost-of-rape/>

- Borchard, T. J. (2011, June 28). Marsha Linehan: *What is dialectical behavioral therapy (DBT)?*. Psych Central. <https://psychcentral.com/blog/marsha-linehan-what-is-dialectical-behavioral-therapy-dbt#1>
- Brennan, D. (2021, October 25). *Overly alert? Hypervigilance and your health*. WebMD. [https://www.webmd.com/mental-health/what-is-hypervigilance#:~:text=Hypervigilance%20%E2%80%94%20the%20elevated%20state%20of,\(PTSD\)%20can%20exhibit%20hypervigilance.](https://www.webmd.com/mental-health/what-is-hypervigilance#:~:text=Hypervigilance%20%E2%80%94%20the%20elevated%20state%20of,(PTSD)%20can%20exhibit%20hypervigilance.)
- Bryant, R. A., Creamer, M., O'Donnell, M., Silove, D., & McFarlane, A. C. (2009). A study of the protective function of acute morphine administration on subsequent posttraumatic stress disorder. *Biological Psychiatry*, *65*(5), 438–440. <https://doi.org/10.1016/j.biopsych.2008.10.032>
- Carhart-Harris, R. L., Bolstridge, M., Rucker, J., Day, C. M. J., Erritzoe, D., Kaelen, M., Bloomfield, M., Rickard, J. A., Forbes, B., Feilding, A., Taylor, D., Pilling, S., Curran, V. H., & Nutt, D. J. (2016). Psilocybin with psychological support for treatment-resistant depression: an open-label feasibility study. *The Lancet Psychiatry*, *3*(7), 619–627. [https://doi.org/10.1016/s2215-0366\(16\)30065-7](https://doi.org/10.1016/s2215-0366(16)30065-7)
- Carhart-Harris, R. L., Roseman, L., Bolstridge, M., Demetriou, L., Pannekoek, J. N., Wall, M. B., Tanner, M., Kaelen, M., McGonigle, J., Murphy, K., Leech, R., Curran, H. V., & Nutt, D. J. (2017). Psilocybin for treatment-resistant depression: fMRI-measured brain mechanisms. *Scientific Reports*, *7*(1). <https://doi.org/10.1038/s41598-017-13282-7>
- Center for Drug Evaluation and Research. (2017, November 14). *Drugs at FDA glossary of terms*. U.S. Food and Drug Administration. <https://www.fda.gov/drugs/drug-approvals-and-databases/drugsfda-glossary->

- Davis, S. (2021, January 18). *The human autonomic nervous system and emotional flashbacks*. CPTSDfoundationorg. <https://cptsdfoundation.org/2021/01/18/the-human-autonomic-nervous-system-and-emotional-flashbacks/>
- Dialectical Behavior Therapy. Behavioral Research Therapy Clinics. (n.d.).
<https://depts.washington.edu/uwbrtc/about-us/dialectical-behavior-therapy/>
- Dworkin, E. R., Wanklyn, S., Stasiewicz, P. R., & Coffey, S. F. (2018). PTSD symptom presentation among people with alcohol and drug use disorders: Comparisons by substance of abuse. *Addictive Behaviors*, 76, 188–194.
<https://doi.org/10.1016/j.addbeh.2017.08.019>
- Dworkin, E. R., Jaffe, A. E., Bedard-Gilligan, M., & Fitzpatrick, S. (2021). PTSD in the year following sexual assault: A meta-analysis of prospective studies. *Trauma, Violence, & Abuse*, 24(2), 497–514. <https://doi.org/10.1177/15248380211032213>
- Elms, L., Shannon, S., Hughes, S., & Lewis, N. (2019). Cannabidiol in the treatment of post-traumatic stress disorder: A Case Series. *Journal of alternative and complementary medicine (New York, N.Y.)*, 25(4), 392–397. <https://doi-org.ezproxy.waterfield.murraystate.edu/10.1089/acm.2018.0437>
- Feder, A., Costi, S., Rutter, S. B., Collins, A. B., Govindarajulu, U., Jha, M. K., Horn, S. R., Kautz, M., Corniquel, M., Collins, K. A., Bevilacqua, L., Glasgow, A. M., Brallier, J., Pietrzak, R. H., Murrough, J. W., & Charney, D. S. (2021). A randomized controlled trial of repeated Ketamine administration for chronic post traumatic stress disorder. *American Journal of Psychiatry*, 178(2), 193–202. <https://doi.org/10.1176/appi.ajp.2020.20050596>
- Feder, A., Parides, M. K., Murrough, J. W., Perez, A. M., Morgan, J. E., Saxena, S., Kirkwood, K., aan het Rot, M., Lapidus, K. A. B., Wan, L.-B., Iosifescu, D., & Charney, D. S.

- (2014). Efficacy of intravenous Ketamine for treatment of chronic posttraumatic stress Disorder. *JAMA Psychiatry*, 71(6), 681. <https://doi.org/10.1001/jamapsychiatry.2014.62>
- Flory, J. D., & Yehuda, R. (2015, June). *Comorbidity between post-traumatic stress disorder and major depressive disorder: Alternative explanations and treatment considerations*. Dialogues in clinical neuroscience. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4518698/>
- Fonkoue, I. T., Marvar, P. J., Norrholm, S., Li, Y., Kankam, M. L., Jones, T. N., Vemulapalli, M., Rothbaum, B., Douglas Bremner, J., Le, N.-A., & Park, J. (2019). Symptom severity impacts sympathetic dysregulation and inflammation in Post-Traumatic Stress Disorder (PTSD). *Brain, Behavior, and Immunity*, S0889-1591(19)307032. <https://doi.org/10.1016/j.bbi.2019.10.021>
- Gallegos, A. M., Crean, H. F., Pigeon, W. R., & Heffner, K. L. (2017). Meditation and yoga for posttraumatic stress disorder: A meta-analytic review of Randomized Controlled Trials. *Clinical Psychology Review*, 58, 115–124. <https://doi.org/10.1016/j.cpr.2017.10.004>
- Gregorio, D. D., Aguilar-Valles, A., Preller, K. H., Heifets, B. D., Hibicke, M., Mitchell, J., & Gobbi, G. (2021). Hallucinogens in mental health: Preclinical and clinical studies on LSD, Psilocybin, MDMA, and Ketamine. *Journal of Neuroscience*, 41(5), 891–900. <https://doi.org/10.1523/JNEUROSCI.1659-20.2020>
- Healthmatch. (2022, September 5). What happens if PTSD goes untreated? HealthMatch. <https://healthmatch.io/ptsd/what-happens-if-ptsd-is-left-untreated#how-is-ptsd-usually-treated>

Hill, M. D. (2020). Adaptive information processing theory: Origins, principles, applications, and evidence. *Journal of Evidence-Based Social Work, 17*(3), 317–331.

<https://doi.org/10.1080/26408066.2020.1748155>

Hill, M. N., Campolongo, P., Yehuda, R., & Patel, S. (2018). Integrating endocannabinoid signaling and cannabinoids into the biology and treatment of posttraumatic stress disorder. *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology, 43*(1), 80–102. [https://doi-](https://doi-org.ezproxy.waterfield.murraystate.edu/10.1038/npp.2017.162)

[org.ezproxy.waterfield.murraystate.edu/10.1038/npp.2017.162](https://doi-org.ezproxy.waterfield.murraystate.edu/10.1038/npp.2017.162)

Hoge, C. W., Grossman, S. H., Auchterlonie, J. L., Riviere, L. A., Milliken, C. S., & Wilk, J. E. (2014). PTSD treatment for soldiers after combat deployment: Low utilization of mental health care and reasons for dropout. *Psychiatric Services, 65*(8), 997–1004.

<https://doi.org/10.1176/appi.ps.201300307>

Holbrook, T. L., Galarneau, M. R., Dye, J. L., Quinn, K., & Dougherty, A. L. (2010). Morphine Use after Combat Injury in Iraq and Post-Traumatic Stress Disorder. *New England Journal of Medicine, 362*(2), 110–117. <https://doi.org/10.1056/nejmoa0903326>

Hollifield, M. (2011). Acupuncture for posttraumatic stress disorder: Conceptual, clinical, and biological data support further research. *CNS Neuroscience & Therapeutics, 17*(6), 769–

779. <https://doi.org/10.1111/j.1755-5949.2011.00241.x>

Husney, A., Romito, K., Maldonado, C., & Hamblen, J. (2022, October 20). Deciding to get treatment for PTSD. PeaceHealth. [https://www.peacehealth.org/medical-](https://www.peacehealth.org/medical-topics/id/ug4372spec)

[topics/id/ug4372spec](https://www.peacehealth.org/medical-topics/id/ug4372spec)

Jeffreys, M. (2014). Clinician's Guide to Medications for PTSD - PTSD: National Center for PTSD. Retrieved from Va.gov website:

https://www.ptsd.va.gov/professional/treat/txessentials/clinician_guide_meds.asp

Judkins, J. L., Moore, B. A., Collette, T. L., Hale, W. J., Peterson, A. L., & Morissette, S. B.

(2020). Incidence rates of posttraumatic stress disorder over a 17-year period in active duty military service members. *Journal of Traumatic Stress, 33*(6), 994–1006. [https://doi-org.ezproxy.waterfield.murraystate.edu/10.1002/jts.22558](https://doi.org.ezproxy.waterfield.murraystate.edu/10.1002/jts.22558)

Kapur, S., Agid, O., Mizrahi, R., & Li, M. (2006). How antipsychotics work—from receptors to reality. *NeuroRX, 3*(1), 10–21. <https://doi.org/10.1016/j.nurx.2005.12.003>

Kar, N. (2011). Cognitive behavioral therapy for the treatment of post-traumatic stress disorder: A Review. *Neuropsychiatric disease and treatment*.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3083990/>

Kaylor, A. (2022, March 29). *How regulation stymies medical research of controlled substances*.

PharmaNewsIntelligence. [https://pharmanewsintel.com/features/barriers-to-medical-research-constructed-by-federally-controlled-substance-scheduling-and-](https://pharmanewsintel.com/features/barriers-to-medical-research-constructed-by-federally-controlled-substance-scheduling-and-classification#:~:text=To%20conduct%20medical%20research%20on,the%20US%20FDA%20approval%20process.)

[classification#:~:text=To%20conduct%20medical%20research%20on,the%20US%20FDA%20approval%20process.](https://pharmanewsintel.com/features/barriers-to-medical-research-constructed-by-federally-controlled-substance-scheduling-and-classification#:~:text=To%20conduct%20medical%20research%20on,the%20US%20FDA%20approval%20process.)

Kearney, D. J., Malte, C. A., McManus, C., Martinez, M. E., Felleman, B., & Simpson, T. L.

(2013). Loving-kindness meditation for posttraumatic stress disorder: A pilot study.

Journal of Traumatic Stress, 26(4), 426–434. <https://doi.org/10.1002/jts.21832>

- Kilpatrick, D. G., & Amstadter, A. B. (2007). Rape-related PTSD: Issues and interventions. *Psychiatric Times*, 24(7). <https://doi.org/https://www.psychiatrictimes.com/view/rape-related-ptsd-issues-and-interventions>
- [Khorramzadeh, E., & Lotfy, A. O. \(1973\). The Use of Ketamine in Psychiatry. *Psychosomatics*, 14\(6\), 344–346. https://doi.org/10.1016/S0033-3182\(73\)71306-2](https://doi.org/10.1016/S0033-3182(73)71306-2)
- Kovacic, P., & Somanathan, R. (2009). Novel, unifying mechanism for mescaline in the central nervous system: electrochemistry, catechol redox metabolite, receptor, cell signaling and structure activity relationships. *Oxidative medicine and cellular longevity*, 2(4), 181–190. <https://doi.org/10.4161/oxim.2.4.9380>
- Krediet, E., Bostoen, T., Brecksema, J., van Schagen, A., Passie, T., & Vermetten, E. (2020). Reviewing the potential of psychedelics for the treatment of PTSD. *International Journal of Neuropsychopharmacology*, 23(6). <https://doi.org/10.1093/ijnp/pyaa018>
- Lebedev, A. V., Lövdén, M., Rosenthal, G., Feilding, A., Nutt, D. J., & Carhart-Harris, R. L. (2015). Finding the self by losing the self: Neural correlates of ego-dissolution under psilocybin. *Human Brain Mapping*, 36(8), 3137–3153. <https://doi.org/10.1002/hbm.22833>
- Lovering, N. (2022, August 17). *PTSD and Social Anxiety: The connection*. Psych Central. <https://psychcentral.com/ptsd/childhood-trauma-social-anxiety>
- Mayo Clinic Staff. (2023, February 24). *Antisocial personality disorder*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/antisocial-personality-disorder/symptoms-causes/syc-20353928>
- Mayo Clinic Staff. (2023a, April 6). *Narcissistic personality disorder*. Mayo Clinic. Paragraph 5. <https://www.mayoclinic.org/diseases-conditions/narcissistic-personality->

disorder/symptoms-causes/syc-20366662

Mayo Clinic Staff. (2022, March 30). *Tricyclic antidepressants (TCAS)*. Mayo Clinic.

<https://www.mayoclinic.org/diseases-conditions/depression/in-depth/antidepressants/art-20046983>

Mayo Clinic Staff. (2019, September 17). *The most commonly prescribed type of antidepressant*.

Mayo Clinic. [https://www.mayoclinic.org/diseases-conditions/depression/in-depth/ssris/art-](https://www.mayoclinic.org/diseases-conditions/depression/in-depth/ssris/art-20044825#:~:text=SSRIs%20treat%20depression%20by%20increasing,reuptake)%20of%20serotonin%20into%20neurons.)

[20044825#:~:text=SSRIs%20treat%20depression%20by%20increasing,reuptake\)%20of%20serotonin%20into%20neurons.](https://www.mayoclinic.org/diseases-conditions/depression/in-depth/ssris/art-20044825#:~:text=SSRIs%20treat%20depression%20by%20increasing,reuptake)%20of%20serotonin%20into%20neurons.)

Mayo Clinic Staff. (2019a, September 12). *An option if other antidepressants haven't helped*.

Mayo Clinic. [https://www.mayoclinic.org/diseases-conditions/depression/in-depth/maois/art-](https://www.mayoclinic.org/diseases-conditions/depression/in-depth/maois/art-20043992#:~:text=An%20enzyme%20called%20monoamine%20oxidase,have%20been%20impacted%20by%20depression.)

[20043992#:~:text=An%20enzyme%20called%20monoamine%20oxidase,have%20been%20impacted%20by%20depression.](https://www.mayoclinic.org/diseases-conditions/depression/in-depth/maois/art-20043992#:~:text=An%20enzyme%20called%20monoamine%20oxidase,have%20been%20impacted%20by%20depression.)

Mayo Foundation for Medical Education and Research. (2022, December 13). Post-traumatic

stress disorder (PTSD). Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/post-traumatic-stress-disorder/symptoms-causes/syc-20355967>

Mazzei, R. (2022, August 9). *How to use bilateral stimulation from EMDR to reduce stress*.

Evolutions Behavioral Health Services. [https://www.evolutionsbh.com/articles/how-bilateral-stimulation-can-help-you-feel-](https://www.evolutionsbh.com/articles/how-bilateral-stimulation-can-help-you-feel-better/#:~:text=What%20Is%20Bilateral%20Stimulation%3F,Desensitization%20and%20Reprocessing%20(EMDR).)

[better/#:~:text=What%20Is%20Bilateral%20Stimulation%3F,Desensitization%20and%20Reprocessing%20\(EMDR\).](https://www.evolutionsbh.com/articles/how-bilateral-stimulation-can-help-you-feel-better/#:~:text=What%20Is%20Bilateral%20Stimulation%3F,Desensitization%20and%20Reprocessing%20(EMDR).)

- Miao, XR., Chen, QB., Wei, K. *et al.* Posttraumatic stress disorder: from diagnosis to prevention. *Military Med Res* 5, 32 (2018). <https://doi.org/10.1186/s40779-018-0179-0>
- Mind Staff. (2020, September). Side effects of antipsychotics. Mind. <https://www.mind.org.uk/information-support/drugs-and-treatments/antipsychotics/side-effects/>
- Nacasch, N., Avni, C., & Toren, P. (2022). *Medical cannabis for treatment-resistant combat PTSD*. *Frontiers in Psychiatry*, 13. <https://doi.org/10.3389/fpsy.2022.1014630>
- National Institute of Health. (2023, May 25). *Prescription opioids Drugfacts*. National Institutes of Health. <https://nida.nih.gov/publications/drugfacts/prescription-opioids#:~:text=snort%20the%20drug,-,Opioids%20bind%20to%20and%20activate%20opioid%20receptors%20on%20cells%20located,want%20to%20repeat%20the%20experience.>
- National Institute of Health. (2017, February 28). *Protein structure reveals how LSD affects the brain*. National Institutes of Health. <https://www.nih.gov/news-events/nih-research-matters/protein-structure-reveals-how-lsd-affects-brain>
- Nestadt, P. (2021, October 13). *Why aren't my antidepressants working?* JHM. <https://www.hopkinsmedicine.org/health/wellness-and-prevention/why-arent-my-antidepressants-working#:~:text=If%20you%20feel%20like%20your,antidepressants%20%E2%80%94%20it's%20called%20breakthrough%20depression.>
- NHS 24. (2023, February 13). *Antidepressants. Tests & treatments*. NHS inform. <https://www.nhsinform.scot/tests-and-treatments/medicines-and-medical-aids/types-of->

medicine/antidepressants#:~:text=It's%20thought%20that%20antidepressants%20work,p
rocess%20isn't%20fully%20understood.

Niesters, M., Martini, C., & Dahan, A. (2014). Ketamine for chronic pain: risks and benefits.

British Journal of Clinical Pharmacology, 77(2), 357–367.

<https://doi.org/10.1111/bcp.12094>

Oehen, P., & Gasser, P. (2022). Using a MDMA- and LSD-group therapy model in clinical practice in Switzerland and highlighting the treatment of trauma-related disorders.

Frontiers in Psychiatry, 13. <https://doi.org/10.3389/fpsyt.2022.863552>

Otto, F. (2022, December 1). *A peek of how ketamine acts as “switch” in the brain.*

<https://www.pennmedicine.org/news/news-releases/2022/december/a-peek-of-how-ketamine-acts-as-switch-in-the-brain>

Przeworski, A., & Dunbeck, K. (2016, June 2). Generalized anxiety disorder: How it compares to PTSD. SpringerLink. [https://link.springer.com/referenceworkentry/10.1007/978-3-319-08359-](https://link.springer.com/referenceworkentry/10.1007/978-3-319-08359-9_118#:~:text=Overlap%20Between%20PTSD%20and%20GAD,2001%3B%20Newman%20et%20al.)

[9_118#:~:text=Overlap%20Between%20PTSD%20and%20GAD,2001%3B%20Newman%20et%20al.](https://link.springer.com/referenceworkentry/10.1007/978-3-319-08359-9_118#:~:text=Overlap%20Between%20PTSD%20and%20GAD,2001%3B%20Newman%20et%20al.)

Sellers, A. (2021, February 10). *Psilocybin and magic mushrooms*. Medical News Today.

<https://www.medicalnewstoday.com/articles/308850>

Serafini, R. A., Pryce, K. D., & Zachariou, V. (2020). The Mesolimbic Dopamine System in chronic pain and associated affective comorbidities. *Biological Psychiatry*, 87(1), 64–73.

<https://doi.org/10.1016/j.biopsych.2019.10.018>

Shapiro, F. (2014). The role of eye movement desensitization and reprocessing (EMDR) therapy in medicine: Addressing the psychological and physical symptoms stemming from

adverse life experiences. *The Permanente Journal*, 18(1), 71–77.

<https://doi.org/10.7812/tpp/13-098>

Sheppard, S. (2022, March 26). *The prevalence of comorbidity in PTSD*. Verywell Mind.

[https://www.verywellmind.com/common-ptsd-comorbidities-](https://www.verywellmind.com/common-ptsd-comorbidities-5213758#:~:text=Comorbidity%20and%20PTSD,-PTSD%20often%20occurs&text=In%20addition%20to%20PTSD%2C%20you,disorders%20because%20symptoms%20often%20overlap.)

[5213758#:~:text=Comorbidity%20and%20PTSD,-](https://www.verywellmind.com/common-ptsd-comorbidities-5213758#:~:text=Comorbidity%20and%20PTSD,-PTSD%20often%20occurs&text=In%20addition%20to%20PTSD%2C%20you,disorders%20because%20symptoms%20often%20overlap.)

[PTSD%20often%20occurs&text=In%20addition%20to%20PTSD%2C%20you,disorders](https://www.verywellmind.com/common-ptsd-comorbidities-5213758#:~:text=Comorbidity%20and%20PTSD,-PTSD%20often%20occurs&text=In%20addition%20to%20PTSD%2C%20you,disorders%20because%20symptoms%20often%20overlap.)

[%20because%20symptoms%20often%20overlap.](https://www.verywellmind.com/common-ptsd-comorbidities-5213758#:~:text=Comorbidity%20and%20PTSD,-PTSD%20often%20occurs&text=In%20addition%20to%20PTSD%2C%20you,disorders%20because%20symptoms%20often%20overlap.)

Smith, S. (2018, April 10). *5-4-3-2-1 coping technique for anxiety*. BHP Blog - Behavioral

Health Partners (BHP) - University of Rochester Medical Center.

[https://www.urmc.rochester.edu/behavioral-health-partners/bhp-blog/april-2018/5-4-3-2-](https://www.urmc.rochester.edu/behavioral-health-partners/bhp-blog/april-2018/5-4-3-2-1-coping-technique-for-anxiety.aspx)

[1-coping-technique-for-anxiety.aspx](https://www.urmc.rochester.edu/behavioral-health-partners/bhp-blog/april-2018/5-4-3-2-1-coping-technique-for-anxiety.aspx)

Tull, M. (2020, March 25). *Symptoms and diagnosis of PTSD with borderline personality*

disorder. Verywell Mind. [https://www.verywellmind.com/having-both-ptsd-and-](https://www.verywellmind.com/having-both-ptsd-and-borderline-personality-disorder-2797510#:~:text=Post%2Dtraumatic%20stress%20disorder%20(PTSD)%20and%20borderline%20personality%20disorder,the%20experience%20of%20traumatic%20events.)

[borderline-personality-disorder-](https://www.verywellmind.com/having-both-ptsd-and-borderline-personality-disorder-2797510#:~:text=Post%2Dtraumatic%20stress%20disorder%20(PTSD)%20and%20borderline%20personality%20disorder,the%20experience%20of%20traumatic%20events.)

[2797510#:~:text=Post%2Dtraumatic%20stress%20disorder%20\(PTSD\)%20and%20bord](https://www.verywellmind.com/having-both-ptsd-and-borderline-personality-disorder-2797510#:~:text=Post%2Dtraumatic%20stress%20disorder%20(PTSD)%20and%20borderline%20personality%20disorder,the%20experience%20of%20traumatic%20events.)

[erline%20personality%20disorder,the%20experience%20of%20traumatic%20events.](https://www.verywellmind.com/having-both-ptsd-and-borderline-personality-disorder-2797510#:~:text=Post%2Dtraumatic%20stress%20disorder%20(PTSD)%20and%20borderline%20personality%20disorder,the%20experience%20of%20traumatic%20events.)

Tull, M. (2022, October 3). 9 ways to relieve anxiety associated with PTSD. *Verywell Mind*.

<https://www.verywellmind.com/ways-of-coping-with-anxiety-2797619>

Undersea Warriors. (2021, November 10). PTSD therapy. *Undersea Warriors*.

[https://underseawarriors.org/article/2021/11/10/why-veterans-often-don-t-look-for-](https://underseawarriors.org/article/2021/11/10/why-veterans-often-don-t-look-for-ptsd-and-how-you-can-help#:~:text=Due%20to%20any%20number%20of,them%20or%20to%20their%20family.)

[ptsd-and-how-you-can-](https://underseawarriors.org/article/2021/11/10/why-veterans-often-don-t-look-for-ptsd-and-how-you-can-help#:~:text=Due%20to%20any%20number%20of,them%20or%20to%20their%20family.)

[help#:~:text=Due%20to%20any%20number%20of,them%20or%20to%20their%20famil](https://underseawarriors.org/article/2021/11/10/why-veterans-often-don-t-look-for-ptsd-and-how-you-can-help#:~:text=Due%20to%20any%20number%20of,them%20or%20to%20their%20family.)

[y.](https://underseawarriors.org/article/2021/11/10/why-veterans-often-don-t-look-for-ptsd-and-how-you-can-help#:~:text=Due%20to%20any%20number%20of,them%20or%20to%20their%20family.)

U.S. Department of Health and Human Services. (n.d.). Borderline personality disorder. National Institute of Mental Health. <https://www.nimh.nih.gov/health/publications/borderline-personality-disorder#:~:text=Borderline%20personality%20disorder%20is%20a,impact%20their%20relationships%20with%20others.>

U.S. Department of Veterans Affairs. (2007, January 1). *Va.gov: Veterans Affairs*. PTSD and Problems with Alcohol Use. https://www.ptsd.va.gov/understand/related/problem_alcohol_use.asp#:~:text=Alcohol%20Can%20Make%20PTSD%20Symptoms%20Worse&text=Using%20too%20much%20alcohol%20makes,numb%20or%20having%20no%20emotions

Vamvakopoulou, I. A., Narine, K. A. D., Campbell, I., Dyck, J. R. B., & Nutt, D. J. (2023). Mescaline: The forgotten psychedelic. *Neuropharmacology*, 222. <https://doi.org/10.1016/j.neuropharm.2022.109294>

Vieweg, W. V. R., Julius, D. A., Fernandez, A., Beatty-Brooks, M., Hetteima, J. M., & Pandurangi, A. K. (2006). Posttraumatic stress disorder: Clinical features, pathophysiology, and treatment. *The American Journal of Medicine*, 119(5), 383–390. <https://doi.org/10.1016/j.amjmed.2005.09.027>

von Majewski, K., Rohleder, N., & Ehring, T. (2023). Peripheral inflammation over the course of a cognitive behavioral intervention in PTSD. *Brain, behavior, & immunity - health*, 30, 100620. <https://doi-org.ezproxy.waterfield.murraystate.edu/10.1016/j.bbih.2023.100620>

Wegener, D. T., & Petty, R. E. (1994). Mood management across affective states: The hedonic contingency hypothesis. *Journal of Personality and Social Psychology*, 66, 1034-1048.