

Exploring the Treatment of Stress, Anxiety, and Depression Through Non-Prescription Medication

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ABSTRACT

This research paper investigates the chemicals produced in the body during periods of stress, depression, and anxiety. Additionally, it identifies effective alternative treatments for stress, depression, and anxiety beyond prescription medications. Our research methodology included reviewing, analysing, and summarising primary sources from peer-reviewed journals and conference publications. We selected articles that examined treatment pathways for different types of emotional distress. Our results suggest that no over-the-counter medications effectively relieve stress, depression, and anxiety. However, plants and essential oils have shown promise in reducing these conditions.

Introduction

Anxiety is considered one of the most pervasive and persistent human emotions, affecting physiological arousal and cognitive functioning (Vitasari et al., 2011). Anxiety disorders affect approximately 40 million people in the United States (about 18% of the population aged 18 to 60) (National Institute of Mental Health, 2007). Anxiety has been defined as a response to a prolonged, unpredictable threat that includes physical, emotional, and cognitive changes (Grillon et al. 1991; Grillon 2008; Davis et al. 2010).

Stress is a natural response of the body, and prolonged exposure to stress can cause varying degrees of damage to the body. Stress can cause memory and concentration loss and lead to emotional disorders such as depression, schizophrenia, and post-traumatic stress disorder (Lupien). Pathophysiological complications of disease are often caused by stress, and people who work or live in stressful environments are more likely to develop many diseases (Yaribeygi). To treat stress, you need to start with the source of the stress. According to research, sleep disorders can cause mental illnesses such as stress anxiety, and depression (Rios et al., 2019), and treating sleep disorders can have a significant impact on reducing stress.

Depression is now the most common type of mental illness, with continuous and prolonged low mood as the main clinical feature and is the most important type of mental illness in modern society. In primary care, it is difficult for clinicians to accurately identify depression and mild depression, with only one-third of people receiving a correct diagnosis (Mitchell et al., 2011). Mild depression and other mental illnesses can lead to major depressive episodes. Therefore, recognizing and treating mild depression is essential for preventing significant illnesses in the future. Mild depression is typically not treated with prescription medication. Therefore, a non-prescription option is needed. The objective of this research is to present multiple, non-prescription methods for treating mild depression.

Methods

Literature Review

Our research methodology included reviewing, analysing, and summarising primary sources from peer-reviewed journals and conference publications. We selected 49 articles that examined treatment pathways for different types of emotional distress. The analysis and conclusions drawn from these articles are presented in this research paper. Our research paper presents the results of our comprehensive analysis, offering a synthesised overview of the various treatment pathways and strategies found in the primary sources. We have drawn evidence-based conclusions from examining these articles, providing valuable insights into the current state of knowledge regarding managing emotional distress.

Selection Criteria

After identifying a plethora of research papers for this research, articles were selected based on several criteria: We considered the publication dates and selected articles that were most recent. Whenever secondary sources were present, we chose the corresponding primary sources from peer-reviewed journals or from national authorities. We also reviewed the abstracts to determine whether the papers were relevant to this research. As a result, the final selection of papers included recent, primary sources from peer-reviewed journals and national agencies.

Results

Biological Reactions to Stress, Anxiety, and Depression

The table below shows the chemicals produced in the body during stress, anxiety, and depressive episodes. Also, it shows the physical symptoms. The table examines reactions to mild, moderate, and severe cases of each episode. These responses stem from established scientific knowledge about the effects of stress on the human body, particularly the activation of the sympathetic-adrenal-adrenal (SAM) axis, the hypothalamic-pituitary-adrenal (HPA) axis, and the release of stress hormones such as norepinephrine (NE), epinephrine (E), and cortisol.

The Chu et al. paper provides a comprehensive review of the existing scientific literature, including research articles, textbooks, and authoritative sources related to physiology and the stress response. They synthesised this information to explain the physiological and chemical responses produced by varying levels of stress, anxiety, and depression.

Table 1. Mental and Physical Impact of Stress, Anxiety, and Depression (Adapted from Chu et al., 2022)

Mental state		Chemical reactions	Physiological reactions
Stress	Mild	<ul style="list-style-type: none"> Elevated norepinephrine (NE) and epinephrine (E) Activation of sympathetic-adrenomedullar (SAM) and hypothalamus-pituitary-adrenal (HPA) axes 	<ul style="list-style-type: none"> Increased heart rate Slight vasoconstriction Mild alertness
	Moderate	<ul style="list-style-type: none"> Continued elevation of NE and E Activation of SAM and HPA axes 	<ul style="list-style-type: none"> Further increased heart rate Increased vasoconstriction Increased alertness and vigilance

			<ul style="list-style-type: none"> ● Enhanced glucose release (glycogenolysis) ● Increased oxygen consumption ● Enhanced cognitive function
	Severe	<ul style="list-style-type: none"> ● Persistent elevation of NE and E ● Activation of SAM and HPA axes 	<ul style="list-style-type: none"> ● Significant increase in heart rate ● Pronounced vasoconstriction ● Heightened alertness and focus ● Marked increase in blood pressure ● Intense muscle tension and readiness for action ● Elevated glucose levels (glycogenolysis and gluconeogenesis) ● Increased oxygen consumption and thermogenesis ● Reduced gastrointestinal motility ● Bronchiolar dilation ● Enhanced pain tolerance
Anxiety	Mild	<ul style="list-style-type: none"> ● Slight increase in NE and E ● Mild activation of SAM and HPA axes 	<ul style="list-style-type: none"> ● Slight increase in heart rate ● Mild alertness ● Slight muscle tension ●
	Moderate	<ul style="list-style-type: none"> ● Moderate increase in NE and E ● Activation of SAM and HPA axes 	<ul style="list-style-type: none"> ● Moderate increase in heart rate ● Increased alertness and vigilance ● Muscle tension and readiness for potential threats
	Severe	<ul style="list-style-type: none"> ● Significant increase in NE and E ● Activation of SAM and HPA axes 	<ul style="list-style-type: none"> ● Pronounced increase in heart rate ● Heightened alertness and focus ● Marked muscle tension and readiness for action
Depression	Mild	<ul style="list-style-type: none"> ● Minor fluctuations in neurotransmitters in certain brain regions 	<ul style="list-style-type: none"> ● Slight decrease in heart rate ● Reduced overall alertness ● Mild fatigue and lethargy
	Moderate	<ul style="list-style-type: none"> ● Reduced levels of serotonin, norepinephrine, and dopamine in specific brain circuits 	<ul style="list-style-type: none"> ● Further decrease in heart rate ● Increased fatigue and apathy ● Reduced motivation and interest in activities
	Severe	<ul style="list-style-type: none"> ● Significantly lowered levels of key neurotransmitters ● Widespread changes in brain chemistry 	<ul style="list-style-type: none"> ● Marked decrease in heart rate ● Profound fatigue and lethargy ● Severe apathy, hopelessness, and social withdrawal

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Prescription Treatment Options for Stress, Anxiety, And Depression

Before examining non-prescription treatment options, we explored a few prescription treatments for the mental health threats explored in this research. For instance, antidepressants are prescription medications that help lead to less stress while relieving depression and anxiety. According to the Centre for Addiction and Mental Health (2009), antidepressants are divided into several categories, such as SSRIs (selective serotonin reuptake inhibitors), SNRIs (serotonin and norepinephrine reuptake inhibitors), NDRI (norepinephrine and dopamine reuptake inhibitors), NaSSAs (noradrenergic and specific serotonergic antidepressants), and MAOIs (monoamine oxidase inhibitors), among others. These medications can treat depression and anxiety but have many side effects. The side effects include nausea, drowsiness, dizziness, nervousness or anxiety, fatigue, loss of appetite, sexual problems, insomnia, weight gain, dry mouth, tremors, constipation, blurred vision, difficulty urinating, and dizziness, to name a few. Furthermore, antidepressants have one thing in common with certain addictive medications: withdrawal effects occur after stopping the medication. These symptoms can occur with any antidepressant. While many over-the-counter medications also have side effects if used in the recommended dosage, over-the-counter medications are usually safe. Prescription medications must be prescribed by a doctor, and we hope to find something relatively safe and easily accessible for treating anxiety, depression, and stress.

Non-Prescription Treatment Options for Stress, Anxiety, and Depression

Through our research, we have identified several non-prescription treatment options for stress, anxiety, and depression (Table 2). These options are readily available because they occur in nature. Each option is further explored following Table 2.

Table 2. Non-Prescription Treatment Options

Treatment Options	Pictures of the Treatment Options
Passion flower	 <p data-bbox="402 1816 667 1848">Figure 1. Passionflower</p>

<p>Valerian root</p>	 <p>Figure 2. Valerian Root</p>
<p>Aromatherapy (Bergamot orange/lavender essence oil)</p>	 <p>Figure 3. Bergamot orange essential oil</p>



Figure 4. Lavender essential oil

Passionflower

Passionflower (*Passiflora incarnata*) is a perennial plant with therapeutic properties. Passionflower and its preparations help reduce stress and help treat insomnia, anxiety, and depression (Janda et al., 2020).

The passionflower (*Passiflora incarnata* L.) is a “perennial plant which can grow up to 10 m, with egg-shaped edible fruit. The low-calorie fruit (41–53 kcal/100 g) is a rich source of vitamins A, C, B1, and B2, as well as calcium, phosphorus, and iron. The species is native to South America, Australia, and SouthEast Asia, and today is cultivated to source raw material for pharmaceutical use” (Janda et al., 2020).

Passionflower can be used to treat stress as well as “burns, diarrhea, menstrual cramps, hemorrhoids, nervous disorders, insomnia, morphine dependence, and is also helpful for convulsions or neuralgia” (Janda et al., 2020).

Passionflower is an herb used to relieve stress (Da Fonseca et al., 2020). According to experimental studies, long-term use of passionflower can reduce stress levels, increase motivation, and improve exercise capacity (Jawna-Zboińska et al., 2016).

Unlike those prescription drugs, passionflower can treat neuropsychiatric symptoms without side effects. With anti-anxiety effects comparable to those of drugs such as oxazepam or midazolam, passionflower is an effective and safe medication for reducing stress reactions, insomnia, anxiety, and depression-like behaviours (Janda et al., 2020).

Valerian Root

Valerian is one of the medicinal plants used to reduce anxiety and sleep disorders (Shimazaki, 2007), which can significantly improve sleep quality and reduce state anxiety and depression symptoms. State anxiety is a transient emotional state that reflects a person's interpretation of a particular stressful situation or how they feel at a particular moment in time (Vitasari et al., 2011).

“Valerian contains 150 to 200 different substances including volatile oils, ketones, phenols, iridoid esters such as valepotriates, alkaloids, valeric acid, amino acids like aminobutyric acid, arginine, tyrosine, glutamine, and noncyclic, monocyclic, and bicyclic hydrocarbons (Yao, 2007). Valerian/cascade mixture significantly decreased the latency time for sleeping and increased total sleeping time” (Tammadon et al., 2021).

Valerian root extract is now available as an over-the-counter drug in many European countries (Ross, 2014). Valerian root is a safe herbal remedy for stress, nervous tension, disturbed sleep patterns, and anxiety.

It has also been shown to be effective in treating anxiety and depression in menopausal women (Kazemian, Parvin, Raeisi Dehkordi, & Rafieian-Kopaei, 2017). Furthermore, valerian has also shown efficacy with minimal or no side effects when used correctly and following expert advice (Ross, 2014). However, the root is not recommended for acute or chronic sleep disorders (Rios et al., 2019).

Effects of Aromatherapy

Aromatherapy comes from the words "aroma" and "therapy." Aroma" means fragrance or odour, and "therapy" means treatment. This therapy is a natural method of healing a person's mind, body, and soul (Worwood, 2000). It has been used as a popular complementary and alternative therapy in many ancient civilizations such as Egypt, China, and India at least 6000 years ago (Alok, 2000; Manniche, 1999). Aromatherapy has been used as a treatment for various complications and conditions. A literature survey shows that this therapy gained widespread attention at the end of the 20th century and has become very popular in the 21st century. Due to its importance, popularity, and general use, it is recognized as an aroma science therapy (Esposito, 2014). Essential oils have gained importance in therapeutic, cosmetic, aromatic, fragrance, and spiritual uses (Evans, 1997; Svoboda, 1994). Aromatherapy uses essential oils as the primary therapeutic agent, which are said to be highly concentrated substances extracted from flowers, leaves, stems, fruits, and roots and also distilled from resins (Dunning, 2013). Essential oils are mixtures of saturated and unsaturated hydrocarbons, alcohols, aldehydes, esters, ethers, ketones, oxides, phenols, and terpenes that may produce characteristic odours (Schiller, 1994; Wildwood, 1996). They are colourless, pleasant-smelling liquids with high refractive index. These oils are very potent and concentrated and can act on pressure points and rejuvenate.

Various essential oils, including lavender (*Lavandula angustifolia*), rose (*Rosa damascena*), orange (*Citrus sinensis*), bergamot (*Citrus aurantium*), lemon (*Citrus limon*), sandalwood (*Santalum album*), clary sage (*Salvia sclarea*), Roman chamomile (*Anthemis nobilis*), and rose geranium (*Pelargonium* spp.), have been explored for their potential in alleviating symptoms of depression and anxiety (Edge, 2003; Lemon, 2004).

Lavender Essence Oil

Lavender essential oil may be the quintessential herbal/aromatherapy treatment for anxiety, states of mood swings, and feelings of emotional instability (Lemon, 2004). Lavender aromatherapy has been found to reduce excessive or agitated behaviour (Lin et al., 2007), improve mood and reduce anxiety (Lehrner et al., 2005), and reduce depression (Cavanagh and Wilkinson, 2002).

Bradley et al. conducted a study examining the effects of oral lavender essential oil on anxiety responses in movie clips. They found that lavender had anxiety-reducing (anxiolytic) effects, especially in people with low anxiety levels. However, these effects were not evident in cases of high anxiety (Bradley et al., 2009). Essential oils are often questioned as having only a placebo effect, but this study used a relatively rigorous double-blind experiment to minimise the placebo effect and bias; This makes the conclusion that lavender can relieve anxiety more plausible.

Previous studies have demonstrated that lavender essential oil can provide some degree of anxiety relief. Shaw et al. compared the effects of lavender oil to those of the prescription anxiolytic drug chlordiazepoxide (CDP). It was demonstrated that the anxiolytic effects of inhaled lavender essential oil were comparable to the known anxiolytic drug chlordiazepoxide (Shaw et al., 2007). The lavender essential oil may be more powerful than thought.

Bergamot Orange Essence Oil

Aromatherapy, a simple, low-risk, and cost-effective approach, utilising essential oils, has demonstrated its potential to positively impact the health status of patients by alleviating anxiety (Wotman et al., 2017). Research findings have suggested that aromatherapy can effectively mitigate pain and anxiety in individuals undergoing cholecystectomy (Seyyed-Rasooli et al., 2015; Eslami et al., 2018). Among the various essential oils employed

in aromatherapy, bergamot, a member of the citrus family, stands out. Extracted from the outer skin layer of the Bergamot orange, it contains significant concentrations of limonene, linalool, and linalyl acetate (Han et al., 2017; Setzer, 2009). Studies conducted by Watanabe et al. have unveiled that the inhalation of bergamot orange essence can induce both physiological and psychological effects (Watanabe et al., 2015). Despite the limited availability of evidence-based information, aromatherapy utilising bergamot essential oil has been associated with stress and anxiety reduction (Saiyudthong, 2011). Furthermore, it has been empirically demonstrated that the application of bergamot orange essence in aromatherapy can effectively lower patients' levels of anxiety, and depression, as well as blood pressure and heart rate (Ni et al., 2013).

Bergamot essential oil may have anxiolytic properties by influencing neurotransmitter release, reducing stress-induced anxiety symptoms, and decreasing biomarkers of stress and anxiety. It is reported that bergamot essential oil exhibited anxiolytic-like effects in behavioural tasks in rats (Rombolà et al., 2017). Additionally, the inhalation of bergamot was associated with a decrease in anxiety symptoms in stressed rats, and it influenced the release of neurotransmitters, including gamma-aminobutyric acid (GABA), which is known for its calming effects (Pasyar, 2020). This reduction in anxiety was further corroborated by the improvement in feelings and relief from stress-induced anxiety symptoms (Han et al., 2017; Ni et al., 2013). Furthermore, the study indicates that the use of bergamot essential oil as aromatherapy has the potential to reduce the level of salivary alpha-amylase, a biomarker of stress and anxiety in patients before laparoscopic cholecystectomy (Rombolà et al., 2019).

Discussion

Our research suggests that plants and essential oils hold promise in reducing the effects of stress, depression, and anxiety. Specifically, passionflower, valerian root, and aromatherapy offer a more natural and non-prescription approach to these emotional distressed states. The inclusion of non-pharmaceutical alternatives in the treatment toolkit provides individuals with a broader range of options that may have fewer or no side effects. Nevertheless, future research should be conducted to better understand the effectiveness and safety of these alternative treatments. While the initial findings suggest promise, more in-depth studies are needed to examine the specific mechanisms through which plants and essential oils work to alleviate stress, depression, and anxiety. Additionally, exploring potential combinations or complementary therapies involving these natural remedies could enhance their effectiveness. This research highlights a more holistic and personalized approach to emotional well-being, addressing the diverse needs and preferences of individuals experiencing stress, depression, and anxiety.

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