Mental Illness: A Review of Causes, Types, and Medicinal Plant Based Therapeutic Interventions

Nehasvita Veeramachaneni[1], Sujana Veeramachaneni[2], Leela Talluri[3], Venkataramana Kandi[4,*]

[1]International Baccalaureate Diploma Programme (IBDP), The Aga Khan Academy, Hyderabad, India
[2]Associate Diploma Coordinator & Science HOD, International Baccalaureate Diploma Programme (IBDP),
The Aga Khan Academy, Hyderabad, India
[3]Manager, Clinical Development and Medical Affairs, Hetero group, Hyderabad, India
[4]Department of Microbiology, Prathima Institute of Medical Sciences, Karimnagar, India
*Corresponding author: ramana20021@gmail.com

Abstract Mental illness is probably the most important silent killer affecting the psychological and overall well-being of humans throughout the world. Humans have been unsuccessful in controlling the adverse effects of this disease which affects all age groups irrespective of their gender. A majority of mental illnesses go undiagnosed due to a lack of knowledge among people. Additionally, this disorder is influenced by social stigma that restricts the diagnosis and treatment-seeking ability of people. Treatment of mental disorders involves psychotherapies, brain stimulation methods, and drugs. Medication, although is available to treat mental illnesses, could be responsible for side effects. Therefore, alternative therapeutic interventions like medicinal plant extracts have been explored in the treatment of mental disorders. In this review, we comprehensively discuss the causes, types, and role of medicinal plants in the treatment and management of mental illnesses.

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1. Introduction

A wide range of conditions that affect mood, thinking, perceptions, feelings, and behavior of a person combinedly represent mental illness/mental disorder. Mental health involves effective functioning in everyday activities that contribute to productive activities (such as work, school, or caregiving), good relationships, the capacity to adapt to change, and the capacity to deal with adversity. Many individuals who suffer from mental illnesses are unwilling to talk about it. Nevertheless, mental illness is not anything to be embarrassed of! Like heart disease or diabetes, it is a medical issue [1]. And it is important that mental health issues are treated [2]. Our knowledge of how the human brain functions has always been advancing, and there are medications and treatments available to assist people in effectively managing mental health disorders. Nothing, however, can be done unless and until the individual decides to get help for themselves [3]. Mental disorder treatments have evolved significantly over a period of time. In the 19th century, this disorder was managed by hypnosis. Later, interventions including shock treatment, and prefrontal lobotomy were applied to manage patients suffering from mental illness.

Different types of drugs are used to treat mental illnesses that include anti-depressants [serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), and norepinephrine-dopamine reuptake inhibitors (NDRIs), tricyclics and monoamine oxidase inhibitors (MAOIs), Esketamine], anti-anxiety medications (SSRIs, SNRIs, benzodiazepines, beta-blockers, Librium, valium, xanax, and buspirone), stimulants (ritalin and adderall), anti-psychotics (clozapine), and mood stabilizers (lithium) [4,5]. Other methods like Bright light therapy and Transcranial Magnetic Stimulation (TMS) therapies have also been explored in the past [5].

2. Causes of Mental Illness

Mental illnesses are conditions that affect emotion, thought, and behavior (or a combination of these). Distress and/or difficulty coping with daily tasks at work, in the family, or in social situations can be symptoms of mental illnesses. Emotions, thinking, communication, learning, resilience, hope, and self-esteem all depend on good mental health. Relationships, emotional and personal well-being, and volunteering to help others in the community or society also all depend on good mental health. A key element of overall well-being is mental health is the status of physical health that could impact and influence the mental health condition of a person.

A majority of mental illnesses have several underlying

causes and risk factors. A person's likelihood of developing a mental health disorder increases as the risk factors increase. Sometimes, the development of mental disease is gradual. It may not show up until a stressful situation triggers it [6].

There are several risk factors and triggers that include genetic predisposition, stressful situations, environment among others as shown in Figure 1.
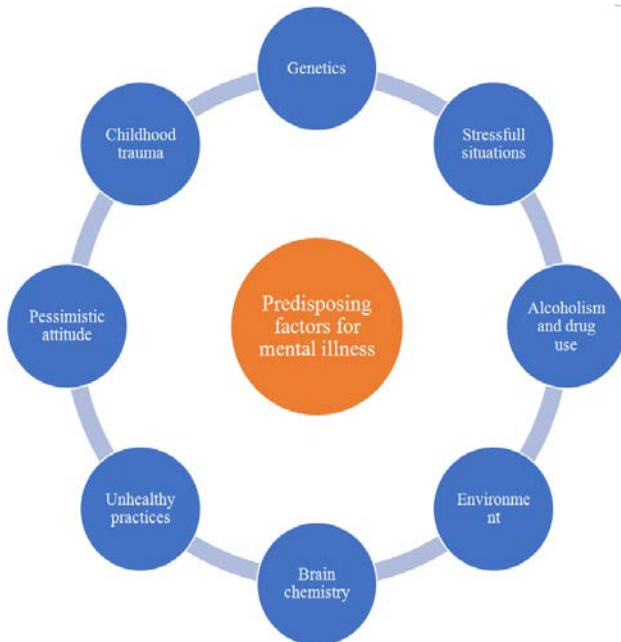

Figure 1. Predisposing/risk factors for mental illness

Genetics: Frequently, mental illnesses have been known to run in families and children born to parents who develop mental illnesses are increasingly predisposed to suffer from mental illness in their lives [7].

Stressful situations: These include situations such as losing a loved one in a vehicle accident or workplace stress, and stressful family relationships among others

Brain chemistry: An imbalance of natural substances in a person's body and brain is frequently a factor in mental illnesses.

Environment: A person's mental health may be impacted by living in a stressful environment. Living in poverty or growing up in an abusive household are two scenarios that place a lot of stress on the brain and can lead to mental health issues.

Unhealthy practices: These include skipping meals or not getting enough sleep among several others

Alcoholism and drug use: Addiction to alcohol and drugs can be hazardous to mental well-being of a person. It might also make recovering from mental illness more challenging

Pessimistic attitudes: People might become trapped in a cycle of despair or anxiety if they are constantly critical of themselves or anticipate the worst

Childhood trauma: Things that happen to a person as a child may still have an effect during adulthood, even though they no longer live in a stressful setting. One mental health issue that affects persons who were abused or neglected as children is complex post-traumatic stress disorder (PTSD).

These risk factors influence more than only who will develop a mental illness. They also have an impact on when and how serious their symptoms will be.

3. Different Types of Mental Illnesses

There are different types of mental illnesses that include anxiety, depression, bipolar disorder among others as shown in Figure 2 [8].
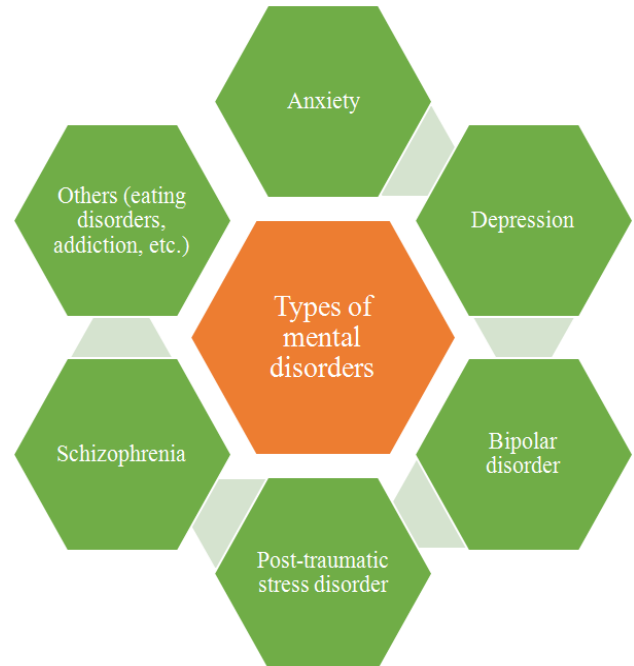

Figure 2. Types of mental illnesses

Anxiety: Approximately 301 million people could be suffering from an anxiety disorder globally. Excessive worry and fear are characteristics of anxiety disorders, along with associated behavioral abnormalities. Anxiety disorders exist in various forms, including generalized anxiety disorder, panic disorder, social anxiety disorder, separation anxiety disorder, and many more.

Eating disorders: Globally, more than 14 million individuals have been suffering from eating disorders. Anorexia nervosa and bulimia nervosa are two examples of eating disorders that feature abnormal eating, obsession with food, and a lot of issues with one's appearance. The behaviors or symptoms have a considerable negative impact on functioning, severe distress, or significant risk to one's health.

Depression: An estimated 280 million people were living with depression worldwide. Depression is different from common mood swings and temporary emotional reactions to problems in daily life. Poor attention, feelings of excessive guilt or low self-worth, hopelessness, suicidal thoughts, disturbed sleep, changes in food or weight, and feeling particularly exhausted or low in energy are some of its symptoms. Moreover, suicide risk is higher among depressed individuals.

Bipolar Disorder: Bipolar disorder is known to have affected 40 million people globally. Periods of manic symptoms alternate with depression in people with bipolar

disorder. The person is in a depressed mood or loses interest in activities. The symptoms of bipolar disorder may include ecstasy/euphoria, irritability, hyperactivity or energy, and other symptoms such as increased talkativeness, racing ideas, inflated self-esteem, decreased need for sleep, distractibility, and sudden careless behavior.

Post-traumatic stress disorder (PTSD): In areas affected by violence, PTSD and other mental problems are very common. Following exposure to a distressing or unpleasant incident or sequence of events, PTSD may develop. It is characterized by everything listed below: 1) Re-living the traumatic incident or events in the present; 2) Avoiding thoughts and recollections of the event(s); or 3) Avoiding actions, persons, or situations that bring back the memory of the event(s).

Schizophrenia: Around 24 million people, or 1 in 300 persons globally, suffer from schizophrenia. The life expectancy of those who have schizophrenia is 10– 20 years lower than that of the general population. Schizophrenia is characterized by severe sensory disabilities and behavioral disturbances. Symptoms might include excessive agitation, persistent delusions, hallucinations, disordered thinking, and disruptive behavior. Schizophrenia patients may also struggle with their cognitive abilities.

4. Impacts of Mental Illnesses on Human Lives

Every person experiences life with a mental health issue in a different form. Some people manage their mental health without it having a major negative effect on their ability to work and live. Others find it to be a big obstacle to work and education. A person is more likely to experience financial stress if they have a mental health disorder, and this pressure can harm a person's health. Additionally, people with mental health issues are predisposed to relationship conflicts/disturbances. Some people who struggle with mental illness may experience feelings of loneliness and disconnection from their communities. Treatment for mental health conditions can occasionally be difficult due to things like various side effects of medicines. Many people who live with mental health conditions experience stigma and mistreatment, which may affect their willingness to disclose their condition and seek treatment. Not all effects of mental health issues are negative. People who live with mental health problems might develop abilities and skills that aid in their recovery [9,10].

Furthermore, the recent Coronavirus Disease -19 (COVID-19) pandemic had a huge impact on the overall mental health and well-being of people across the globe. It led to issues like fear and anxiety, loneliness and isolation disruption or no access to mental healthcare services/treatment centers, and lastly, financial pressures and redundancy [11]. There was a significant increase in the symptoms of anxiety and depression during the COVID-19 pandemic when compared to pre-pandemic levels among people living in United States of America as depicted in Figure 3. 14.5 years is the peak age of the onset of mental illnesses. However, these conditions are

more common among young adults aged 18-25 years compared to adults aged 26 and above [12].
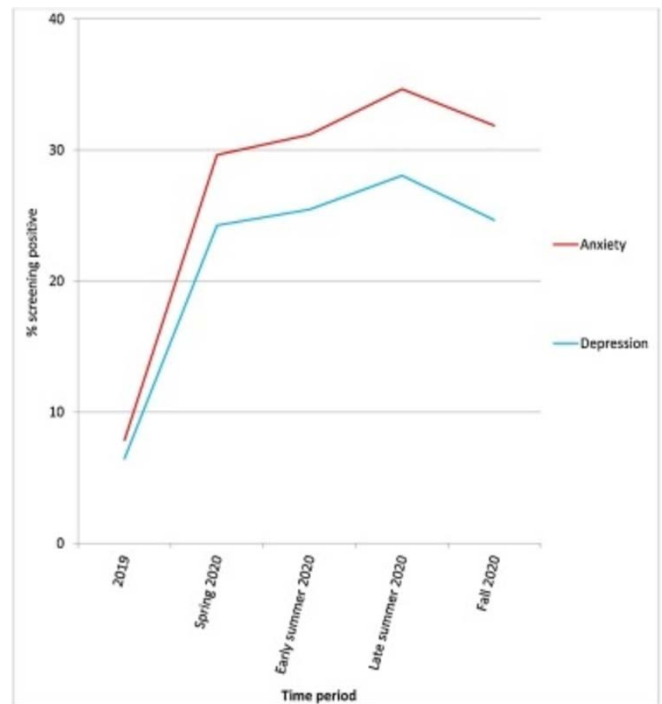

Figure 3. Trends in prevalence of anxiety and depression before and during the COVID-19 pandemic [12]

5. Treatment of Mental Illness

A person's quality of life will be much enhanced by taking treatment for and managing their mental illness. Although dealing with a mental illness will always be difficult, receiving the right treatment will make the situation much more manageable and enable the person to take full advantage of everything life has to offer without the illness getting in the way.

A person's life expectancy may be increased by improving mental health. According to the available literature, even minor mental health issues can affect life expectancy. Regardless of an individual's preferred method of treatment, getting treatment for mental health issues is absolutely essential. Whether it be through medicine or psychiatric counseling, it is crucial that every person suffering from a mental illness desires to get treatment.

Additionally, talk therapy (often referred to as psychotherapy) combined with medication is the most efficient method of treatment for the majority of mental illnesses. This is because talk therapy allows the patient to let go of stress rather than keeping it all to themselves. As they express their feelings, it assists them in coping with situations that they find troubling or uncomfortable. Talk therapy and medication work much better together because medication lessens the symptoms of various mental conditions. A preferable substitute for drugs or psychedelics is medical plants and herbs as medication, as they have less side effects, and thus ensure that they cause no harm to a person's physical health [13].

6. Medicinal Plant Based Interventions for Mental Illnesses

Anxiety

Medicinal plants were found to be increasingly helpful in the treatment of anxiety. A recent met-analysis that assessed the role of various medicinal plants in the treatment of anxiety noted that valerian, chamomile, passionflower, saffron, gamisoyo-san, ginkgo biloba, and kava. However, the results from this study revealed mixed effectiveness of the medicinal plants in comparison to placebo [14,15].

Chamomile: The chamomile plant resembles a daisy in appearance. Roman chamomile and German chamomile are the two varieties of chamomile that can be used medicinally. Chamomile products such as extracts, tea, tablets, and creams can be used to reduce stress and anxiety. Previous studies, including a recent meta-analysis examined chamomile's effectiveness and safety as a long-term therapy for generalized anxiety disorder and insomnia. Researchers observed that people who continued taking chamomile were much less likely to experience symptoms of anxiety despite some mild side-effects [16,17].

Valerian: The plant known as valerian, or *Valeriana officinalis*, is indigenous to Asia and Europe. People have used the root for many centuries to treat depression, anxiety, and sleep issues. Valerian root is available in different forms such as tablets, extracts, or tea. Few high-quality investigations on the effects of valerian have been conducted thus far. According to the National Center for Complementary and Integrative Health (NCCIH), valerian is mostly harmless and safe to use. However, the NICCIH does not recommend this to pregnant women, nursing mothers, and children under the age of 3 as the safety and efficacy of valerian cannot be completely guaranteed in the long term [18].

Galphimia glauca: The plant species *Galphimia glauca* is native to Mexico. It was traditionally used as a tranquilizer to relieve anxiety. The effectiveness of *G. glauca* as a treatment for anxiety symptoms was examined in a clinical experiment in 2012. And they concluded that it's safe [19].

The evidence for *G. glauca* as a therapy for anxiety, according to a Trusted Source review from 2018 says its results are promising. However, the lack of plant material has kept medicinal firms from exploiting its potential [20].

Cannabidiol: Cannabidiol (CBD) is one of the active components of the cannabis plant *Cannabis sativa*. According to the available evidence, CBD may have a soothing impact on the central nervous system. Despite the Food and Drugs Administration (FDA) of the USA which currently restricts its usage, CBD is a widely available natural substance in forms such as liquid extract, tablets, and creams. The researchers concluded that CBD could be helpful for people with problems associated with anxiety [21,22].

Depression

More than 100 medicinal plants and herbs have been explored for their role in the treatment of depression. Among them St. John's wort, saffron crocus, lemon balm and lavender, turmeric, roseroot, ginkgo, Korean ginseng, borage, brahmi, mimosa tree and magnolia bark and kava have been studied extensively for their usefulness in the treatment of depression [23-26].

Lavender: Lavender oil is a popular essential oil which is frequently used by people to relax, reduce anxiety, and improve their mood. Lavender may have a great potential for lowering anxiety and enhancing sleep, according to a 2013 review [27]. When it comes to reducing anxiety, lavender's effects on studies have been inconsistent. However, there is still strong data to support its efficacy as a therapy for depression currently.

Chamomile: According to a 2012 study, chamomile, which originates from the *Matricaria recutita* plant, has been shown to be effective in treating depression and nervousness [28]. According to the studies, chamomile significantly reduced depression symptoms. However, further research is required to validate the chamomile's other health advantages in treating depression symptoms.

Crocus sativus: According to certain research, like this study from 2018, using saffron to treat symptoms of depression is a completely safe and effective method [29].

The potential advantages of saffron for people suffering from depression, however, would be confirmed by more research. Moreover, researchers have yet to study more about any possible negative effects.

Bipolar disorder

Different medicinal plants/herbs like valerian, ashwagandha, lemon balm, rhodiola rosea, passionflower, and skullcap have been explored in the management of depression [30].

Valerian: Many people experiencing bipolar disorder struggle with anxiety and sleeplessness in between mood episodes and even after their major symptoms have been controlled. Since Ancient Greece and Rome, humans have employed the medicinal plant valerian. It is regarded as a nervine, a kind of plant that supports the nervous system. Given that valerian appears to act on GABA receptors in the brain to lessen anxiety and sleeplessness, research shows that it may be able to treat these symptoms [31]. This doesn't seem to have any major side effects, however, at larger dosages, daytime drowsiness is a possibility.

Rhodiola rosea: People have utilized the adaptogenic plant *Rhodiola rosea*, also known as golden root, for thousands of years to treat depression, fatigue, and stress. Rhodiola has been demonstrated to reduce anxiety, although some experts advise against using it to treat bipolar disorder since it may provoke manic episodes in some people. However, according to some specialists, the herb may be beneficial for those who use anti-depressants and mostly experience depression with occasional hypomanic symptoms [32].

Melissa officinalis: *Melissa officinalis*, also known as lemon balm, is a part of the mint family and has a lemon fragrance. It could help with symptoms of anxiety, memory loss, and insomnia. Since ancient times, people have used lemon balm in traditional medicine for a variety of purposes, including as an astringent, a mood booster, and a treatment for tension headaches. According to research on animals, memory and well-being may be improved by lemon balm [33]. One study found that giving healthy individuals a single dosage of the plant boosted their memory and gave them a calmer sensation [34]. Lemon balm has further been demonstrated to lessen anxiety when taken alongside valerian [35].

Post-traumatic stress disorder

The clinical trial evidence identified more than 20 types of medicinal plants like Kava kava (*Piper methysticum*), Chamomile (*Chamaemelum nobile*), Ginkgo (*Ginkgo biloba*), Skullcap (*Scutellaria laterifolia*), Milk Thistle (*Silybum marianum*), Astragalus (*Astragalus membranaceus*), Passionflower (*Passiflora incarnata*), Gotu kola (*Centella asiatica*), Rhodiola (*Rhodiola rosea*), Echium (*Echium vulgare*), Thryallis (*Galphimia glauca*) and Lemon balm (*Melissa officinalis*) being useful in the treatment of mental disorders including PTSD [36].

Dong Quai: Although there's not enough research about Dong Quai and PTSD, the substance was found to help with nervous system management, minimize panic attacks help in stress management, and control the adrenal gland's reaction. The management of the adrenal glands is particularly significant in this case since PTSD patients have been shown to have reactions [37].

Ginkgo biloba: *Ginkgo biloba*, one of the planet's oldest plants, is sometimes referred to as a living fossil. Strong antioxidants found in its leaves can aid in fighting against free radicals, a kind of chemical that kills cells. In doing so, ginkgo also aids in promoting blood flow and circulation in the body and brain. An improvement in brain function, including an enhancement in mental acuity and memory precision, is made possible by this blood flow promotion [38]. As a result, some people believe ginkgo might help treat disorders like this.

Schizophrenia

Treatment and management of schizophrenia using medicinal plants including *Panax ginseng*, *Hypericum perforatum*, *Elettaria cardamomum*, *Glycyrrhiza glabra*, *Phyllanthus emblica*, *Ocimum basilicum*, *Matricaria chamomilla*, and *Ginkgo biloba* were explored since long time [39,40].

Ginseng: Ginseng may lessen the frequency of schizophrenia symptoms, according to research. Ginseng's ability to help with stress relief both mentally and physically is due to its adaptogenic qualities. Additionally, it can increase energy and enhance general mental clarity and cognition. According to studies, ginseng can help lessen negative schizophrenia symptoms such as "the flat affect" (lack of emotional expression) [41].

Withania somnifera: *Withania somnifera*, widely known as ashwagandha, may assist in reducing the intensifying symptoms of schizophrenia according to a small clinical research report in the Journal of Clinical Psychiatry [42]. For thousands of years, this plant has been employed in Indian traditional medicine. Stress levels in patients as well as negative symptoms of schizophrenia were shown to be significantly reduced by it.

While this isn't a complete list of herbs that can be useful, according to the available research, these have proven to be reliable herbs for managing mental health issues. However, we believe that these herbs/supplements are not fully recommended as an alternative choice to conventional medicine. This is because there is scarcity of evidence regarding their efficacy and potential adverse effects. In many ways, medicinal herbs might serve as a therapeutic addition to the conventional treatments. Additionally, it is crucial to communicate with a doctor regarding the dosage, and potential drug interactions before taking any of these herbs discussed in this review.

Yoga, mindfulness, nutritional supplements like omega-3 fatty acids, and invasive and non-invasive electrical stimulation therapies like deep brain stimulation, trigeminal nerve stimulation (TNS), transcranial random noise stimulation (tRNS), transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial ultrasound stimulation (TUS) are some examples of complementary, alternative and specific therapies for mental health issues [43-48]. These methods might improve overall well-being, lessen anxiety, reduce symptoms of depression, and promote relaxation [49,50]. For patients who do not have symptom alleviation through standard medicines or psychotherapy, doctors may advise these alternative treatments.

7. Conclusions

Mental illnesses are complex and therefore people suffering from mental disorders must be carefully managed to improve the quality of life. Physicians/psychiatrists could advise patients to use medicinal plants discussed in this review as a replacement for or preferably in addition to their prescribed medications. There is some evidence to support the advantages of these therapies for mental health issues including depression, anxiety, bipolar disorder, PTSD and schizophrenia. Research regarding medicinal plant utility in treating mental illnesses is limited. As a result, there are still many unanswered questions, and more research in this direction would be helpful in determining the real benefit of these alternative and complementary treatments.

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