

Utilization of Natural Resources in The Management of Neuropsychiatric Disorders Through A Holistic Approach (A Systematic Review)

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ABSTRACT

Neuropsychiatric disorders are a major global health concern due to their high prevalence and significant impact on individuals, families, and society. This paper explores the role of natural resources in enhancing mental health through a holistic approach, including promotive, preventive, curative, and rehabilitative strategies. A systematic review and meta-analysis methodology was employed, analyzing data from peer-reviewed journals and reputable databases such as Elsevier, SAGE, and PubMed, focusing on studies from the past decade. The findings highlight the therapeutic potential of herbal compounds, such as curcumin, flavonoids, and polyphenols. Specific plants like *Passiflora incarnata* and *Melissa officinalis* demonstrate efficacy in reducing anxiety and depression, and in supporting cognitive recovery. Promotive strategies aim to maintain emotional stability, while preventive approaches protect neural cells from oxidative stress. Curative treatments use bioactive components to alleviate symptoms, and rehabilitative interventions aid post-treatment recovery. The integration of herbal medicine into mental health services may improve accessibility and sustainability. This study emphasizes the importance of utilizing natural resources to support mental well-being, reduce the burden of neuropsychiatric disorders, and foster a more comprehensive and sustainable mental health care system.

KEYWORDS: Neuropsychiatric disorders, mental health, herbal medicine, natural resources, holistic therapy

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I. INTRODUCTION

Neuropsychiatric disorders are multifactorial and complex disorders of the nervous system that have a high prevalence and can occur in all age groups ^[1]. These disorders involve the interaction between brain function and human behavior. Neuropsychiatric disorders encompass a wide range of mental health problems characterized by impairments in thoughts, feelings, behaviors, as well as an individual's ability to interact socially ^[2]. The main risk factors for these disorders include genetic influences, social conditions, environmental exposures, and the use of psychotropic drugs ^[3]. With their large impact on the global burden of disease and disability rates, neuropsychiatric disorders are becoming an urgent health issue to be addressed ^[3].

Neuropsychiatric disorders, which are a combination of neurological disorders and mental disorders, contribute significantly to the global burden of disease ^[4]. These disorders account for approximately 13% of the total disease

burden in the world ^[5]. Affecting more than 350 million people, neuropsychiatric disorders are one of the leading causes of global disability and have a major impact on individuals and society as a whole ^[1]. Their global prevalence is estimated at 13% to 49% of the population at some point in their lives ^[4]. In Indonesia, neuropsychiatric disorders include conditions such as anxiety disorders (5.7%), depression (3.7%), schizophrenia (1%), bipolar disorder (0.7-1.5%), and obsessive-compulsive disorder (2.5-3%) ^[6]. Indonesia has a prevalence of people with mental disorders of around 1 in 5, meaning that around 20% of the population in Indonesia has potential mental disorder problems ^[7]. These figures reflect the high need to understand and treat neuropsychiatric disorders in a holistic and integrated manner.

Neuropsychiatric disorders have a significant impact in both health and non-health aspects. From a health perspective, disorders such as depression, migraine,

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dementia, and anxiety disorders are closely correlated with brain function and are a major cause of reduced quality of life and global disability [8]. Beyond the health impacts, these disorders carry serious social consequences. One of these is the stigma that develops due to a lack of public understanding of mental health, which creates discrimination against individuals with neuropsychiatric disorders [9]. In Indonesia, this stigma often leads to sufferers being ostracized from their social environment [10]. In fact, extreme forms of discrimination such as the practice of shackling still occur in some areas, further worsening the physical and mental condition of sufferers [11].

A holistic approach in the management of neuropsychiatric disorders is an urgent need, in line with the principles stipulated in Law No. 18/2014 on Mental Health. This law emphasizes the importance of implementing promotive, preventive, curative, and rehabilitative strategies in an integrated manner [12]. The promotive approach aims to increase public understanding and reduce stigma towards mental disorders. Preventive efforts are made through early prevention of psychiatric problems with timely intervention. The curative approach focuses on providing diagnosis and treatment that supports the recovery of individuals to their optimal functioning. Meanwhile, rehabilitative efforts help restore individuals' social and occupational functions, while encouraging their independence in the community. The implementation of this policy aims to improve the quality of life of sufferers and reduce the social and economic burden of neuropsychiatric disorders.

Natural resource-based medicine offers a potential solution to overcome the limitations of modern therapies, which are often expensive, complicated, and not easily accessible to populations in rural areas [4]. Natural bioactive compounds have shown significant benefits in improving symptoms of various neuropsychiatric disorders, such as depression, anxiety, and cognitive impairment, through mechanisms that include neurotransmitter regulation and neuroinflammation amelioration [8].

This approach to medicine also includes various forms of therapy, such as the use of natural medicinal waters in preventive physiotherapy, which has been implemented in various parts of the world [13]. This study highlights the utilization of natural resources into the formal health system, while opening up opportunities for further exploration of the effectiveness and safety of these therapies. With proper integration into the healthcare system, natural resource-based medicine can be a holistic and innovative alternative to improve the quality of life of patients with neuropsychiatric disorders.

This article aims to contribute to a comprehensive scientific understanding of the utilization of natural resources in supporting the treatment of neuropsychiatric disorders. This is important given the increasing

psychological stress in daily life and the high prevalence of mental disorders. In addition, this article also aims to identify natural resources that have therapeutic potential and understand their mechanisms in the treatment of neuropsychiatric disorders. Based on these two objectives, the results of this study seek to discuss the role of natural resources in various stages of mental health interventions, including health promotion, prevention, treatment, and rehabilitation of mental disorders. It is hoped that this research will broaden insights into the relationship between nature and human mental health, while encouraging the sustainable utilization of natural resources for relevant interventions.

Related research has been conducted to explore the potential of herbs or natural materials in the treatment of neuropsychiatric disorders, such as depression, anxiety, and dementia. Some studies highlight bioactive compounds such as polyphenols, flavonoids, and alkaloids contained in traditional plants, which have pharmacological effects such as anti-inflammatory, antioxidant, and neurotransmitter modulation. For example, curcumin from turmeric has been tested in various animal and human models to treat depression and anxiety through the regulation of neurotransmitters such as serotonin and dopamine [14]. In addition, plants such as *Passiflora incarnata* and *Melissa officinalis* were used traditionally as therapies for anxiety and insomnia, which were later validated in modern clinical studies [15, 16].

Utilization of local biological resources is also a focus in traditional medicine for neuropsychiatric disorders. For example, research in Burkina Faso identified 66 plant species used by traditional healers to treat disorders such as epilepsy and hallucinations, with methods such as maceration and fumigation [4]. This research demonstrates the importance of utilizing traditional knowledge to support local resource-based therapies.

Various research methods have been applied by past researchers in an attempt to understand natural resource use for mental health. One of the most commonly used methods is systematic reviews and meta-analyses, which aim to collect and analyze data from various existing studies on natural resource use. In this way, researchers can draw stronger conclusions about the effectiveness and benefits of natural resources for mental health as well as identify irregularities in the existing literature. For example, a systematic review has been used to evaluate the use of curcumin in the treatment of major depression and anxiety, which involved analyzing from various preclinical to clinical trials [14].

In addition, clinical studies in humans and animals have been used to evaluate the effectiveness of natural ingredients in treating mental health problems. These studies involved testing natural resource-based interventions to

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assess their effectiveness against symptoms of mental illness. For example, controlled clinical trials (randomized RCTs) have been conducted to test the effects of *Passiflora incarnata* on patients with generalized anxiety disorder, which showed significant anxiolytic effects [14]. In animal models, the use of curcumin together with piperine showed positive behavioral changes associated with the reduction of chronic stress and depression [3]. These studies provide empirical evidence supporting the therapeutic benefits of various natural ingredients.

Laboratory experiments also play an important role in supporting the understanding of how active compounds in natural resources work. This research has focused on biochemical and physiological analysis to assess their effects on the nervous system and psychological processes. For example, studies on the effects of curcumin in mouse models showed increased levels of BDNF (Brain-Derived Neurotrophic Factor), which plays an important role in neuroplasticity and restoration of brain function [14]. In addition, phytochemical analysis was used to identify active compounds in plants such as *Securidaca longepedunculata*, which has been used traditionally in West Africa to treat epilepsy and hallucinations [4]. The findings from these laboratory experiments not only shed light on the scientific basis of the effectiveness of natural ingredient-based mental health agents but also provide a foundation for future research.

In an effort to improve overall human well-being, the influence of the natural environment on mental health is a very important and relevant subject of research. By understanding the complex relationship between humans and nature, it is hoped to create a healthier, more resilient and sustainable society. This approach requires the development of comprehensive and sustainability-oriented methods, so that the positive potential of the natural environment can be optimally utilized [17].

To support mental health improvement, holistic and sustainable solutions are needed. One promising strategy is the integration of natural resource utilization into the mental health care system. Various natural elements, such as parks, forests, and green spaces, not only provide an environment that supports relaxation, but can also be used as intervention tools in health promotion and prevention of mental disorders. By utilizing natural resources efficiently, mental health management and service delivery systems can be expanded. This approach not only focuses on curative interventions, but also emphasizes promotive and preventive strategies to prevent mental disorders early on and even into rehabilitative care.

II. METHOD

The method used in the preparation of this article is a systematic review or meta-analysis. Relevant articles were

selected through searches of reputable databases, such as Elsevier, SAGE, and PubMed. The search was conducted using specific keywords, including: "Natural resources for neuropsychiatric disorders", "Medicinal plants and mental health", and "Herbal remedies for depression and anxiety". The focus of the search was limited to publications published within the last ten years to ensure that the data and results obtained were the most recent and relevant. The articles included studies with observational and experimental designs, as well as literature reviews that provided a comprehensive overview of the topic.

Once relevant articles were collected, a meta-analysis was conducted to explore the therapeutic potential of natural resources and identify their role in the management of neuropsychiatric disorders. The findings from the articles were then categorized based on the type of intervention proposed, which included promotive, preventive, curative and rehabilitative approaches to neuropsychiatric disorders. This grouping aimed to generate a more in-depth and comprehensive understanding of the contribution of natural resources in treating neuropsychiatric disorders, as well as to identify the mechanisms underlying their therapeutic effects. As such, the results of this meta-analysis are expected to provide broader and more fundamental insights for the development of research and clinical practice in neuropsychiatry.

III. RESULTS

TABLE.1 Summary of research related to natural resource utilization for neuropsychiatric disorders.

Author/Year	Research Objectives	Intervention	Key Results
Hahn (2024)	Explore the effectiveness of traditional Chinese medicine, including Chinese herbs and acupuncture, in treating neuropsychiatric symptoms.	Chinese herbal medicine (CHM) and acupuncture	Tian Wang Bu Xin Dan Suan Zao Ren Tang to calm the soul and treat insomnia. California Poppy for insomnia. Acupoints such as GV20, SP6, and M-HN-1 to calm the soul and treat insomnia.
Halagali et al. (2024)	Highlight the therapeutic potential of	Natural bioactive compounds	Centella asiatica for memory enhancement.

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	traditional plant compounds in treating neuropsychiatric diseases.		Bacopa monnieri for neuron protection. Withania somnifera for antidepressant effects. Curcuma longa (kunyit) to protect synapses from dysfunction.
Asgharian et al. (2022)	Identify bioactive compounds that may serve as adjunctive therapies or substitutes for conventional drugs.	Natural bioactive compounds	- Curcumin from Curcuma longa (Kunyit) and Hypericin and hyperforin from perforatum showed oxidative stress reduction and serotonin modulation. - Piperine from Piper nigrum showed decreased hyperactivity and increased attention.
Le dkk. (2021)	Assess the evidence of interaction between herbal medicines and prescription drugs used in neuropsychiatric therapy.	Herbal products	- The interaction of St. John's wort with paroxetine or sertraline causes serotonin syndrome. - Ginkgo biloba interaction with risperidone causes

			- priapism. - Ginkgo biloba interaction with trazodone causes coma. - Kava's interaction with alprazolam causes coma.
Ghazizadeh et al. (2021)	Provide a historical overview of the application of lemon balm (Melissa officinalis L.) for neuropsychiatric disorders.	Lemon balm	Lemon balm has anxiolytic (anxiety-reducing) and antidepressant properties. Lemon balm is effective in reducing insomnia and improving sleep quality in patients with anxiety disorders. Lemon balm protects the nervous system and improves cognitive function, including memory and concentration.
Mok et al. (2020)	Explore the potential of natural compounds in stimulating the peripheral immune system to treat neuropsychiatric disorders	Natural compounds & immunomodulatory compounds	18β-Glycyrrhetic Acid from Glycyrrhiza radix) reduces inflammation in the brain associated with neuropsychiatric disorders. - Cinnamaldehyde (from

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	(NPDs).		cinnamon bark) protects nerve cells from oxidative damage and inflammation . • Geniposide (from Gardenia jasminoides fruit) reduces inflammation and protects nerve cells				• Passiflora edulis (Passionflower) as a sedative and to treat anxiety. • Valeriana wallichii (Valerian Root) as a natural tranquilizer for sleep disorders, helps relieve stress, aids in recovery from conditions such as depression or nervous system disorders.
Janda et al. (2020)	Evaluate the effectiveness of Passiflora incarnata (passion flower) in treating neuropsychiatric disorders	Passiflora incarnata (passion flower)	• Passiflora incarnata shows effectiveness in reducing anxiety and can improve sleep.				
Rehman et al (2019)	Explore the role of natural compounds and nutraceuticals in preventing and treating neurological disorders and other neurodegenerative diseases.	Natural products and bioactive compounds	• Ginseng and extract Withania somnifera improve nerve regeneration and cognitive function, reducing damage caused by brain ischemia.				• Securidaca longepedunculata to treat epilepsy and mental disorders. • Calotropis procera is used for anxiety and insanity. • Annona senegalensis is used for epilepsy and hallucinations. • Allium sativum (garlic) as an adjunct in the treatment of mental illness.
Kumar et al (2019)	Review the use of medicinal plants as an alternative in treating neuropsychiatric disorders.	Herbal medicine	• Hypericum perforatum (St. John's Wort) for mild to moderate depression. • Panax ginseng to improve cognitive function and reduce stress.				
				Kinda et al. (2017)	Identify medicinal plants with psychoactive properties used in the treatment of neuropsychiatric disorders.	Medicinal plants	
				Lopresti (2017)	evaluate the potential of curcumin as a therapeutic	Curcumin	• Curcumin (from turmeric) shows

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	agent for neuropsychiatric disorders		significant antidepressant and anxiolytic effects in animal models and human patients. Curcumin can increase the expression of BDNF, which plays an important role in neuroplasticity and brain function.
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IV. DISCUSSION

Furthermore, the discussion will focus on the relevance of the interventions summarized in Table 1 to promotive, preventive, curative, and rehabilitative efforts in the management of neuropsychiatric disorders. However, some studies did not explicitly state the purpose of the intervention in terms of promotive, preventive, curative, or rehabilitative. Therefore, this classification is based on the information available in each study. In order to simplify the classification, the parameters listed in Table 2 were used.

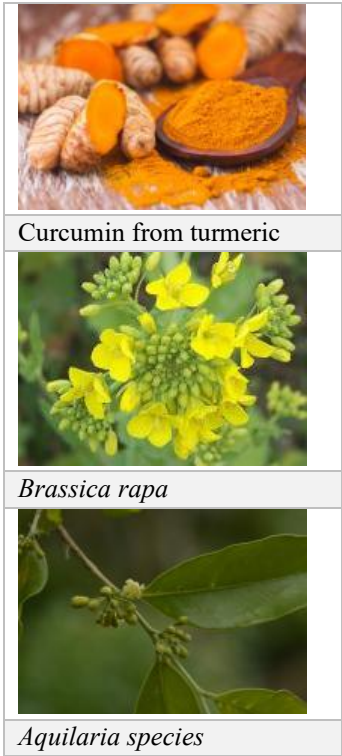
Table 2. Classification of treatment efforts for neuropsychiatric disorders.

Parameters	Promotive	Preventive
Target population	Healthy people	People at risk
Destination	Improving welfare	Prevent interference
Duration	Ongoing	Performed before the disorder appears
Author/Year	Hahn (2024)	Halagali et al. (2024), Rehman et al (2019), Kumar et al (2019), Lopresti (2017)
Parameters	Curative	Rehabilitative
Target population	People with active disorders	Post-treatment person
Destination	Resolving symptoms of the	Restoring function

	disorder	
Duration	Performed when disturbance occurs	Performed after treatment
Author/Year	Hahn (2024), Halagali et al. (2024), Asgharian et al. (2022), Ghazizadeh et al. (2021), Mok et al. (2020), Janda et al. (2020), Kumar et al. (2019), Kinda et al. (2017), Lopresti (2017)	Hahn (2024), Ghazizadeh et al. (2021), Kumar et al. (2019)

Promotive

Mental health promotion through natural resource-based interventions is an important focus in the early prevention of neuropsychiatric disorders. One of these efforts can be done through natural resource-based therapies that aim to maintain emotional balance and improve quality of life's. Hahn Revealed that formulas Tian Wang Bu Xin Dan and Suan Zao Ren Tang are designed to calm the soul with anxiolytic and sedative effects[18]. This approach supports nervous system function and helps individuals deal with stress without targeting specific symptoms of neuropsychiatric disorders. The promotive relevance is seen in the formula's ability to prevent conditions from worsening due to emotional instability.



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Figure 1: Some medicinal plants for the prevention of neuropsychiatric disorders.

Preventive

Preventive efforts focus on preventing nerve damage through protection against oxidative stress and inflammation [19]. Research by Halagali et al. Rehman et al. and Lopresti showed that natural antioxidant compounds, such as curcumin from turmeric, flavonoids, and polyphenols, have the ability to prevent oxidative stress-induced cell and tissue damage associated with neuropsychiatric disorders [20, 21, 14]. This mechanism is important as oxidative stress is a major risk factor in the development of neurodegenerative disorders such as Alzheimer's and Parkinson's. Curcumin also has neuroprotective effects, which may protect neurons from damage and support the growth of new neurons [14]. In addition, Kumar et al. also noted that Brassica rapa and Aquilaria species protect brain cells from oxidative damage [22]. This approach underscores the importance of natural compounds and medicinal plants to prevent the incidence of neuropsychiatric disorders in high-risk populations.

Curative

Curative approaches target the treatment of active symptoms of neuropsychiatric disorders through natural resource-based interventions that offer safe and effective alternatives. Hahn's research shows that Tian Wang Bu Xin Dan and Suan Zao Ren Tang formulas help with anxiety, depression, and insomnia in Alzheimer's patients, while reducing dependence on antipsychotics [18]. Halagali et al. added that Centella asiatica and Bacopa monnieri improve cognitive function and reduce anxiety through neuronal protection and synaptic plasticity [20]. Meanwhile, Hypericum perforatum and curcumin showed antidepressant effects by modulating serotonin and dopamine pathways [3]. Melissa officinalis or lemon balm is also effective for anxiety, insomnia, and memory disorders, with improved sleep quality and cognitive function [21]. In addition, bioactive compounds such as Cinnamaldehyde and 18β-Glycyrrhetic Acid help protect neurons from inflammation and oxidative stress, supporting patient recovery [23].

Plants such as Passiflora incarnata show anxiolytic potential stabilizing neurotransmitter pathways without significant side effects, making them relevant for anxiety disorders and insomnia [15]. Kumar, also reported the benefits of Hypericum perforatum, Panax ginseng, and Valeriana wallichii in overcoming depression and improving sleep quality [21]. Various traditional plants, such as Securidaca longepedunculata, are used to treat disorders such as epilepsy and hallucinations through traditional processing methods [4].

Curcumin being one of the prominent agents, with antidepressant and anxiolytic effects, both as monotherapy and adjunct to conventional treatment [14]. Overall, these interventions are not only effective in addressing the active

symptoms of neuropsychiatric disorders but also offer solutions with a low risk of side effects, making them an important alternative to conventional pharmacological therapies [24].

Rehabilitative

Rehabilitative efforts aim to restore cognitive and emotional functions after primary treatment [25]. Ghazizadeh et al.'s research notes that Melissa officinalis helps patients in the recovery process by improving cognitive function [20]. Hahn's research also shows that the use of herbal formulas in Alzheimer's patients supports the recovery of social functions and reduces emotional distress, which is relevant in long-term therapy [18]. Kumar et al. added that plant-based therapies, such as Panax ginseng and Passiflora edulis, contribute to relaxation and improve patients' ability to return to optimal functioning in daily life [21].



Figure 2: Some medicinal plants for curative efforts of neuropsychiatric disorders.

Conclusion

The utilization of natural resources for mental health is based on scientific understanding of the potential of natural compounds to modulate biochemical processes in the brain. Bioactive compounds such as curcumin, flavonoids, and polyphenols have mechanisms of action that focus on regulating key neurotransmitters such as serotonin,

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dopamine, and norepinephrine, which play an important role in mood regulation and stress response. In addition, these compounds also have antioxidant properties that help reduce oxidative stress and inflammation in the brain, two major factors that can exacerbate neuropsychiatric disorders. With neuroprotective effects and the ability to stimulate neurogenesis, these natural compounds offer a safer alternative and potentially reduce dependence on chemical drugs, while providing long-term benefits for the maintenance of mental health.

Plant-based therapies play an important role at various stages of mental health intervention. At the promotive stage, formulas such as Tian Wang Bu Xin Dan and Suan Zao Ren Tang help maintain emotional balance and improve quality of life. A preventive approach is taken through protecting nerve cells with plants such as *Aquilaria* species and *Brassica rapa*. Meanwhile, at the curative stage, plants such as *Centella asiatica*, *Melissa officinalis*, and *Panax ginseng* showed benefits in reducing anxiety, improving cognitive function, and improving sleep. At the rehabilitative stage, plant-based interventions, one of which is *Melissa officinalis*, support the recovery of social and emotional functions, helping patients to return to optimal functioning in daily life.

The use of herbal plants and bioactive compounds has great potential to be applied in the management of neuropsychiatric disorders at various stages, ranging from promotive to rehabilitative. The results of this review provide a basis for integrating nature-based therapies into formal health services, both as complementary and alternative treatments. In addition, these findings can guide the development of community-based health programs, such as training on the use of local medicinal plants and education on the benefits of herbal therapies in supporting mental health.

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