Exploring the Role of Acupuncture in Mental Health: Addressing Depression and Anxiety

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Abstract. The World Health Organization's World Mental Health Report highlights the global prevalence of mental disorders, with anxiety and depressive disorders being the most common. Existing treatments for depression and anxiety often use antidepressants and anxiolytics, which have unwanted side effects, delayed onset of action, inadequate efficacy, and risk of dependence. Nonpharmacological therapies like psychotherapy, meditation, and physical exercise offer safer alternatives but may take longer to show effective results. The limitations of both approaches highlight the need for complementary therapies that can improve treatment efficacy without increasing the burden of side effects. This limited review examines the role of acupuncture in overcoming mental health problems by conducting a literature search. According to a variety of research findings, acupuncture is a promising nonpharmacological treatment for reducing depression and anxiety symptoms; it also can be combined with pharmacological treatment or complementary medicine to improve outcomes. Compared to pharmacological therapies, acupuncture is less expensive and has fewer side effects. Evidence suggests that acupuncture plus pharmacological treatment is more effective than drugs alone, safe, well tolerated, and has a rapid onset of action. This review provides valuable insights for researchers investigating nonpharmacological treatments for mental health problems.

Keywords: Acupuncture, Anxiety, Depression, Mental Health.

INTRODUCTION

According to the World Health Organization's World Mental Health Report - Transforming Mental Health for All (2022), globally, there are nearly 1 billion people, which is 1 in 8 people, living with mental disorders. It is estimated that lost productivity across the life course caused by mental health conditions will cost the global economy $6 trillion by 2030. In both men and women, anxiety and depressive disorders are the most common [1]. In Southeast Asia, approximately 13.2% of the population lives with a mental health condition [1], [2]. The estimated prevalence of mental disorders in the region has barely changed in the last two decades. In general, the stagnant prevalence of mental disorders is related to mental health care gaps [3]. Because of worsening

mental health conditions, depression and anxiety can interfere with an individual's daily functioning [2], [4], [5].

Existing treatments for depression and anxiety commonly utilize antidepressants and anxiolytics, often with unwanted side effects, delayed onset of action, inadequate efficacy and risk of dependence [6]. On the other hand, non-pharmacological therapies, such as psychotherapy, meditation and physical exercise, offer safer alternatives but may take longer to show effective results. The limitations of these two approaches point to the need for complementary therapies that can improve treatment efficacy without increasing the burden of side effects.

SUBJECT AND METHOD

In this context, acupuncture is effective in addressing mental health conditions, including depression and anxiety. This review aims to examine the role of acupuncture in addressing depression and anxiety and as a strategy to reduce mental health problems. By exploring the potential of acupuncture in this context, this referendum may provide new insights and pave the way for further research into the use of acupuncture therapy in addressing the mental health challenges faced today.

RESULT AND DISCUSSION

Depression

Definition

According to the ICD-10 Classification of Mental and Behavioral Disorders issued by the World Health Organization and the Guidelines for the Classification and Diagnosis of Mental Disorders in Indonesia (PPDGJ) III, depression is defined as a depressed mood, loss of interest and pleasure, and reduced energy leading to increased fatigue and decreased activity. Fatigue felt after little effort is expected. Other common symptoms are reduced concentration and attention, reduced self-esteem and self-confidence, feelings of guilt and worthlessness (even in mild episodes), a gloomy and pessimistic outlook on the future, ideas or actions of self-harm or suicide, sleep disturbances and reduced appetite [7], [8], [9].

According to the American Psychological Association, depression is extreme sadness or hopelessness that lasts for days, interferes with activities of daily living and can cause physical symptoms such as pain, weight loss or gain, disturbed sleep patterns, or lack of energy. People with depression may also experience an inability to concentrate, feelings of worthlessness or excessive guilt, and thoughts of death or suicide [10].

According to The Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), depression is a mood disorder characterized by persistent feelings of sadness, emptiness, and irritability, along with specific cognitive and somatic symptoms. A diagnosis of depression is made when there are five or more of the following symptoms:

significant changes in appetite, weight loss or gain, insomnia or hypersomnia, constant fatigue, feelings of worthlessness, decreased concentration and memory impairment, and suicidal ideation. The symptoms must have been present and always present for at least two weeks or more [11].

Epidemiology

As a severe psychiatric disorder, depression is a leading cause of disability worldwide. The World Health Organization estimates that depression will be the most significant cause of global disease burden by 2030 [12]. Depression affects about 3.8% of the population, including 5% of adults and 5.7% of people over the age of 60. About 280 million people worldwide suffered from depression in 2019 [13]. The prevalence in individuals aged 18 to 29 years is three times higher than in individuals aged 60 years or older [14]. Depression is approximately twice as common in women as men; this gender gap is observed throughout the lifespan but first appears after puberty [15]. Some studies suggest that one-third of women will experience a major depressive episode in their lifetime [16]. From a survey conducted by I-NAMHS in Indonesia in 2021 on adolescents aged 10-17 years, it was found that women (6.7%) had a higher prevalence of depression than men (4.0%) [17].

Pathophysiology

The underlying pathophysiology of depressive disorders is not yet clearly known. Current data suggest that a complex combination of neurotransmitters, receptor modulation, and sensitivity causes emotional symptoms. Clinical and preclinical research points to disruptions in central nervous system serotonin (5-HT) activity as a significant contributor. Other neurotransmitters involved are norepinephrine (NE), dopamine (DA), glutamate, and brain-derived neurotrophic factor (BDNF). The efficacy of selective serotonin reuptake inhibitor (SSRI) treatment indicates that central nervous system 5-HT activity plays a role in the pathophysiology of depressive disorders. In addition to increased neurotransmitters, research findings suggest that modulation of neural receptors, intracellular signalling, and gene expression play a role over time [14].

Anxiety Disorders

Definition

Anxiety is a normal feeling necessary for human life and functioning. Anxiety can help individuals avoid potentially risky circumstances and plan for problems. Stressful life events, such as taking a test, starting a new school, or speaking in front of a group, can cause a natural form of childhood anxiety, which can help prepare a child for the next challenge. Anxiety disorders are different from regular anxiety or generalized anxiety. When intense feelings of fear and distress are overwhelming and prevent individuals from carrying out daily activities, anxiety disorders may be the cause [18], [19].

In the National Institute for Health and Care Excellence (NICE) guidelines, anxiety disorders are defined as disorders that include generalized anxiety disorder, social anxiety disorder, post-traumatic stress disorder, panic disorder, obsessive-compulsive disorder, and body dysmorphic disorder [20].

Epidemiology

Anxiety disorders often begin in childhood and adolescence. Anxiety disorders are estimated to affect one in every eight children. The National Institute of Mental Health (NIMH) estimates that 25.1% of adolescents aged 13 to 18 will have an anxiety disorder, with 5.9% having severe anxiety disorder. Boys and girls are equally affected in childhood, but after puberty, girls seem to be more affected than boys [19]. Anxiety is the most prevalent mental health problem for both adolescent boys (25.4%) and adolescent girls (28.2%) aged 10-17 years [17].

Pathophysiology

Research suggests a hereditary link to anxiety disorders. Environmental stressors have a significant influence, albeit to varying degrees. Neurotransmitter systems are thought to play a function in some of the processes modulating the occurrence of anxiety. The most used neurotransmitter systems are serotonergic and noradrenergic. According to research, underactivation of the serotonergic system and overactivation of the noradrenergic system may be contributing factors. Low serotonin and increased noradrenergic activity are thought to contribute to the development of anxiety. Neurotransmitter systems are intricately interrelated, with changes in one system causing changes in the other through feedback mechanisms. Serotonin and GABA are inhibitory neurotransmitters that reduce the stress response. These neurotransmitters have become major therapeutic targets [21].

Recent research has shown that anxiety affects several neural circuits. This research highlights two critical regulatory centres in the brain's hemispheres: the hippocampus and the amygdala. Research indicates that these centres activate the hypothalamic-pituitary-adrenocortical (HPA) axis. The HPA axis is known to contribute to anxiety, although its regulation remains unclear to researchers. New research suggests that the hippocampus and amygdala play important roles [21].

The hippocampus and amygdala regulate memory and emotion, among other functions. The hippocampus plays a vital role in verbal memory, especially when remembering the time and location of emotionally charged events. The limbic system, which includes the hippocampus and amygdala, is responsible for regulating emotions. Anatomical projections connect the hippocampus, amygdala and hypothalamus. Anxiety differs from fear in that the stimulus that elicits fear is absent or not immediately threatening, but in anticipation of danger, arousal, alertness, physical preparedness, and similar negative feelings and cognitions occur. Different forms of internal or external variables or triggers play a role in producing anxiety symptoms, such as panic disorder, agoraphobia, post-traumatic stress disorder, specific phobias, and generalized anxiety

disorder, as well as substantial anxiety that typically occurs in major depression. Research is ongoing to determine whether dysregulation of these fear pathways contributes to the symptoms of anxiety disorders [21].

Several investigations into the psychopathology of anxiety have demonstrated the role of brain circuits distributed between cortical and subcortical regions. These circuits are essential in judging and expressing behaviours associated with environmental threats. Consequently, disruption of connections in these circuits will lead to inaccuracies in judging what is dangerous or not, resulting in neurological disorders that give rise to feelings of anxiety [22].

Acupuncture

Acupuncture has been used to treat various diseases for over 3,000 years in China and other Asian countries and migrated to Europe and America between the sixteenth and nineteenth centuries. The public and health professionals in the West increasingly accepted complementary and alternative medicine, making acupuncture popular. In 1979, the WHO identified 43 diseases that could be treated with acupuncture, which grew to 63 in 1996, as shown in Table 1 [23].

Some basic studies have shown that acupuncture has been indicated for analgesic, muscle relaxation, anti-inflammatory, mild anxiolytic, and antidepressant, with possible biological mechanisms such as central sensitization, neurotransmitters, gut flora, immune regulation, oxidative stress, and neuroinflammation. In addition, clinical practice guidelines on acupuncture have been formulated in countries such as China, Japan, South Korea, the United States, the United Kingdom, Australia, and Malaysia [23].

Acupuncture is a promising nonpharmacological treatment for reducing depression, anxiety and other symptoms and can be combined with pharmacological treatment or complementary medicine to improve outcomes. Compared to pharmacological therapies, acupuncture is less expensive and has fewer side effects. In addition, a growing body of evidence suggests that acupuncture plus pharmacological treatment is more effective than drugs alone, is also safe, well tolerated, and has a rapid onset of action.

Table 1. Common indications for acupuncture recommended by the WHO.

Indications	Example
Nervous system diseases	Migraine, tension headache, trigeminal neuralgia, facial nerve paralysis, and ischemic stroke.
Musculoskeletal diseases	Osteoarthritis (knee), fibromyalgia, low back pain, neck pain, sciatica and postoperative pain.
Gastrointestinal diseases	Nausea and vomiting, constipation, postoperative ileus, and irritable bowel syndrome.
Gynecologic/reproductive diseases	Dysmenorrhea, premenstrual syndrome, menopausal syndrome and infertility.
Respiratory disease	Common cold, acute bronchitis, acute and chronic pharyngitis, asthma, and chronic obstructive pulmonary disease.
Oral diseases	Toothache, post-extraction pain and gingivitis.

Mental illness	Anxiety, depression and insomnia.
Addiction	Nicotine dependence and alcohol dependence.
Endocrine diseases	Obesity

Depression

A recent systematic review and meta-analysis conducted by Chen et al. in 2023, including twenty-two studies with a total of 2391 participants, found that acupuncture can reduce the severity of depression, consistent with a previous Cochrane review conducted by Smith et al. in 2018. The network meta-analysis showed that the combination of acupuncture (electroacupuncture/manual acupuncture) and antidepressants achieved better efficacy when compared to antidepressants alone [SMD = -4.98, 95% CI (-7.24, -2.71); SMD = -2.85, 95% CI (-5.60, -0.10)] and waiting list [SMD = -8.86, 95%CI (-14.78, -2.93); SMD = -6.73, 95% CI (-12.86, -0.61)]. However, acupuncture alone or combined with antidepressants showed no evidence of benefit when compared to sham acupuncture (SA). The study also estimated a probability ranking where electroacupuncture (EA) plus antidepressant (0.8294), manual acupuncture (MA) plus antidepressant (0.6470), and MA (0.5232) were the top three interventions. Acupuncture, whether used alone or in conjunction with pharmacological treatment, provides therapeutic advantages and is a safe option for controlling depression [24].

Wang et al. also conducted a systematic review and meta-analysis with different outcomes in 2022. A total of 21 studies were included in the meta-analysis, involving 1,733 clinical patients. The leading evaluation indicators were Hamilton Depression Rating Scale (HAMD), total clinical response rate, Rating Scale for Side Effects (SERS), and Treatment Emergent Symptom Scale (TESS). Compared to the control group, acupuncture combined with paroxetine treatment showed lower HAMD scores (WMD = -4.18 [-5.04, -3.31], $P<0.001$), higher total response rate (OR=4.01 [3.01, 5.33], $P<0.001$), lower SERS score (WMD= -2.54 [-4.58, -0.51], $P<0.001$), and lower TESS score (WMD=-4.39 [-5.15, -3.62], $P<0.001$). The results suggest that acupuncture combined with paroxetine has a better therapeutic effect on depression compared with conventional drug treatment. Moreover, its safety is comparable to conventional therapy, as lower side effects and adverse reactions indicate. However, this study has some limitations in that all the studies included in this article were from China, and all the studies that met the inclusion and exclusion were Chinese-language studies, which could potentially bias the original research. Future large-scale clinical studies are needed to verify the reliability of the results and address these limitations [25].

Zhou et al. also conducted a specific systematic review and meta-analysis in 2022. A total of 16 RCTs were included in the meta-analysis, focusing on electroacupuncture (EA) for depression. EA significantly reduced Hamilton Depression Rating Scale (HAMD) scores [I^2: 0.0%, SMD: -2.28%, 95% CI (-3.16, -1.39)], with moderate quality of evidence. The ameliorative effect of EA plus antidepressants is better than Western medicine in patients with depression [I^2: 26.2%, SMD: -1.18%, 95% CI (-1.42, -0.94)], with moderate quality of evidence. Electroacupuncture was as effective as antidepressants in reducing self-rating depression scale (SDS) scores [I^2: 36.4%, WMD: -1.15%,

95%CI (-2.93, -0.63)], with deficient quality of evidence. Electroacupuncture was found to be more effective than sham EA stimulation. However, no statistical difference was found between EA plus antidepressants or EA alone with antidepressants [I^2: 0%, RR: 1.05%, 95%CI (0.73, -1.53)]. Nonetheless, this meta-analysis shows that EA reduces HAMD scores, making it a potential treatment option for depression. The use of EA plus antidepressants can enhance the curative effect and effectively reduce the side effects of the drugs [26].

A more recent systematic review and meta-analysis focusing on EA was conducted by Zhang et al. in 2023. This study presented a meta-analysis of 34 studies that examined the effectiveness of EA in treating depression. The findings of the meta-analysis suggest that EA can be an alternative or complementary therapy for depression. Electroacupuncture was found to have similar effectiveness to antidepressants and manual acupuncture but superior to selective serotonin reuptake inhibitors (SSRIs) when used in combination with antidepressants. Limitations of the meta-analysis include the overall moderate quality of evidence and the varying duration of interventions across trials. Future research should focus on conducting high-quality, large-scale, randomized controlled trials to investigate further EA's efficacy in treating depression [27].

Anxiety Disorders

A systematic review and meta-analysis by Yang et al. 2021 included twenty studies with 1823 participants. They found that acupuncture was more effective than control in reducing anxiety symptoms in patients with anxiety disorders. Acupuncture significantly reduced anxiety symptoms, with a standard mean effect -0.41 (95% CI -0.50 to -0.31, p<0.001). The study also conducted subgroup analysis to explore potential factors contributing to heterogeneity, looking at the type of anxiety assessment, duration of acupuncture intervention, and kind of control condition. Subgroup analysis showed that acupuncture had a better effect in reducing anxiety symptoms when assessed using a self-report scale compared to a physician-rated scale.

Furthermore, the group treated with acupuncture for a shorter duration showed a better effect than those treated for a more extended period. However, anti-anxiety medications and other interventions work slowly and show efficacy after six weeks. Therefore, after six weeks, the effects of acupuncture did not differ from those of different interventions. These findings suggest that acupuncture can be used in the early stages of treatment for anxiety disorders and can improve the first six weeks of treatment. Subgroup analysis also found the group using Western medicine as a control showed a better effect of acupuncture on anxiety than the group using other traditional Chinese medicine as a control. This may be because Western medicine works slowly. Another reason for this may be that Chinese people prefer traditional Chinese medicine. Further research is needed to strengthen these findings [28].

A systematic review and meta-analysis was conducted by Li et al. in 2022, which included twenty-seven studies with a total of 1782 participants. The combined results showed that the acupuncture group had better outcomes in Hamilton Anxiety Scale (HAMA) scores [MD = -0.78, 95%CI (-1.09, -0.46)], total effective rate RR = 1.14, 95%CI (1.09, 1.19)], Self-Assessment Anxiety Scale (SAS) score [MD = -2.55, 95%CI

(-3.31, -1.80)], and Treatment Emergent Symptom Scale (TESS) score [MD = -1.54, 95%CI (-1.92, -1.17)] compared to the control group. The acupuncture group was also safer than the control group. This study found that acupuncture can effectively alleviate anxiety symptoms with fewer side effects. However, high integrated heterogeneity was found in this study, which may be due to methodological differences, lack of allocation concealment, and inconsistent data quality. Che Lina's article was identified as an influencing factor in the meta-analysis. After removal, the heterogeneity decreased significantly, and a fixed-effects model was used to analyze the results. The results showed a statistically significant difference that acupuncture exerted a positive effect on anxiety symptoms compared with Paroxetine as well as Flupentixol and Melitracen. The study concluded that randomized controlled trials with large sample sizes and high quality are needed to support the findings further [29].

Acupuncture Points

This review found that only 2 of the seven studies provided details of the acupuncture points from the included RCTs. There were differences/variations in the acupuncture points used in each study. The heterogeneity of acupuncture points has been described as the most severe problem facing systematic review studies. The lack of standardization in acupuncture point selection in related clinical trials is understandable, given that acupuncture has developed in various countries for over 2000 years, while controlled clinical trials on acupuncture only started in the 1970s in Western countries. Meanwhile, this idea of "standardization" also goes against the essence that acupuncture therapy is provided through an individualized approach (case by case). Therefore, the lack of standardization in selecting appropriate acupuncture points limits the value of systematic reviews, increases heterogeneity and may lead to unreliable review conclusions [24]. GV20, SP6, PC6, and HT7 are four acupuncture points widely used in the included studies.

Safety of Acupuncture

Wang et al. reported that among participants who received EA and placebo, two cases of nausea, two cases of fatigue, and one case of itching were reported as adverse events [25]. Among participants who received EA, bleeding and hematoma around the needle insertion site were reported as adverse reactions. Li et al. reported no adverse reactions during the study [29].

CONCLUSION

The importance of a multi-dimensional approach to supporting mental health includes psychosocial support, mental health education, improved access to mental health services, as well as strategies to reduce distress and increase resilience.

Treatment of depression and anxiety mainly includes psychotherapy, complementary and alternative medicine, exercise, and pharmacotherapy. However, due to the side

effects of medications as well as the accelerated pace of modern life, medications are often used as the treatment of choice. In this case, acupuncture can be one of the non-pharmacological therapies and plays a role in promoting mental well-being and providing support to help individuals manage stress so as not to aggravate depression/anxiety.

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