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Efficacy of Acupressure in Managing Chronic Low Back Pain

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Abstract

Chronic low back pain (CLBP) remains one of the leading causes of disability worldwide, significantly affecting physical function, psychological well-being, and quality of life. Conventional management strategies, including pharmacological therapy, physical rehabilitation, and surgical interventions, often provide incomplete relief and may be associated with adverse effects or high costs. In recent years, acupressure has emerged as a complementary and non-invasive therapeutic approach rooted in traditional Chinese medicine, based on the stimulation of specific meridian points to restore the body's energy balance and promote self-healing mechanisms. the efficacy of acupressure in the management of chronic low back pain through a review of clinical outcomes related to pain intensity, functional mobility, and quality of life indicators. Evidence from randomized controlled trials and quasi-experimental studies suggests that acupressure may significantly reduce pain severity, improve lumbar flexibility, decrease muscle tension, and enhance daily functional performance. The proposed mechanisms include improved local blood circulation, endorphin release, neuromodulation of pain pathways, and reduction of stress-related muscle spasm.

Keywords: Chronic Low Back Pain; Acupressure Therapy; Complementary and Alternative Medicine

Introduction

Chronic low back pain (CLBP) is one of the most common musculoskeletal disorders worldwide and a leading contributor to disability and reduced productivity. It is generally defined as pain localized below the costal margin and above the inferior gluteal folds that persists for more than twelve weeks. Unlike acute episodes, chronic low back pain often involves complex interactions among biological, psychological, and social factors, making its management challenging. Persistent discomfort, limited mobility, sleep disturbances, and emotional stress frequently compromise an individual's overall quality of life. Conventional treatment approaches for CLBP typically include analgesic and anti-inflammatory medications, physical therapy, exercise programs, behavioral interventions, and in severe cases, surgical procedures. While these methods may provide short-term relief, long-term effectiveness is sometimes limited, and prolonged pharmacological use can lead to adverse effects or dependency concerns. As a result, increasing attention has been directed toward complementary and alternative therapies that emphasize holistic and non-invasive care. Acupressure, a therapeutic technique rooted in traditional East Asian medicine, involves applying manual pressure to specific points on the body known as acupoints. These points correspond to meridian pathways believed to regulate the flow of vital energy. From a

biomedical perspective, acupressure is thought to stimulate nerve endings, improve blood circulation, trigger endorphin release, and modulate pain perception through neurophysiological mechanisms. Because it does not require needles or medication, acupressure is considered safe, cost-effective, and suitable for self-management under appropriate guidance. Given the growing burden of chronic low back pain and the need for accessible long-term management strategies, evaluating the therapeutic effectiveness of acupressure has become increasingly important. This study aims to explore the efficacy of acupressure in reducing pain intensity, improving functional outcomes, and enhancing quality of life among individuals with chronic low back pain, while also identifying gaps in existing research and areas for future investigation.

Epidemiology and Global Burden of Chronic Low Back Pain

Chronic low back pain (CLBP) is widely recognized as one of the most prevalent and disabling musculoskeletal conditions worldwide. It affects individuals across all age groups, though its incidence increases with age and peaks between the third and sixth decades of life. Epidemiological studies estimate that up to 60–80% of people experience low back pain at some point in their lifetime, and a significant proportion develop chronic symptoms lasting longer than three months.

Globally, low back pain consistently ranks among the leading causes of years lived with disability (YLDs). Large-scale population studies have shown that it remains the top contributor to disability across both developed and developing nations. The burden is not limited to physical discomfort; it also includes psychological distress, reduced social participation, and economic hardship.

The prevalence of chronic low back pain varies across regions due to occupational patterns, lifestyle factors, healthcare access, and demographic characteristics. Urbanization, sedentary behavior, obesity, and aging populations have contributed to rising incidence rates in many countries. Manual laborers, healthcare workers, drivers, and individuals with prolonged sitting occupations are particularly vulnerable.

From an economic perspective, the global burden of CLBP is substantial. Direct costs include medical consultations, diagnostic procedures, medications, and rehabilitation services. Indirect costs arise from absenteeism, presenteeism, reduced productivity, and long-term disability compensation. In many regions, low back pain accounts for one of the highest healthcare expenditures among non-communicable diseases.

Importantly, chronic low back pain often coexists with anxiety, depression, and sleep disturbances, amplifying its overall societal impact. The recurrent and persistent nature of the condition further strains healthcare systems, especially in resource-limited settings where access to specialized pain management services may be restricted.

Given its high prevalence, chronic course, and multidimensional consequences, chronic low back pain represents a major global public health concern. Understanding its epidemiology and burden is essential for designing effective prevention strategies, optimizing treatment

approaches, and integrating complementary therapies such as acupressure into comprehensive pain management frameworks.

Pathophysiology and Mechanisms of Pain in Chronic Low Back Pain

Chronic low back pain (CLBP) is a multifactorial condition involving complex interactions between anatomical structures, neural pathways, and psychosocial factors. Unlike acute low back pain, which is often linked to a specific injury or inflammatory process, chronic pain persists beyond normal tissue healing time and may continue even in the absence of clear structural abnormalities.

1. Structural and Mechanical Factors

The lumbar spine consists of vertebrae, intervertebral discs, facet joints, ligaments, muscles, and neural elements. Degeneration of intervertebral discs, facet joint arthropathy, ligament strain, and muscle imbalance are common contributors to chronic pain. Disc degeneration can lead to reduced disc height, annular tears, and altered load distribution, increasing mechanical stress on surrounding tissues. In some cases, nerve root irritation or compression may result in radicular pain radiating to the lower extremities.

However, imaging findings do not always correlate directly with pain severity. Many individuals show degenerative changes without symptoms, suggesting that structural abnormalities alone do not fully explain chronic low back pain.

2. Inflammatory and Biochemical Mechanisms

Low-grade inflammation plays a role in persistent pain. Degenerated discs and injured tissues may release inflammatory mediators such as cytokines and prostaglandins. These substances sensitize nociceptors, the pain-sensitive nerve endings, making them more responsive to mechanical or chemical stimuli. Ongoing inflammation can contribute to sustained peripheral sensitization, prolonging discomfort even after initial tissue damage.

3. Peripheral and Central Sensitization

One of the defining features of CLBP is altered pain processing within the nervous system. Peripheral sensitization occurs when nociceptors become hyperresponsive due to repeated stimulation. Over time, continuous pain signals may induce central sensitization, a condition in which neurons in the spinal cord and brain amplify pain perception.

Central sensitization lowers the pain threshold, meaning that normally non-painful stimuli may be perceived as painful (allodynia), and mildly painful stimuli may feel more intense (hyperalgesia). This mechanism explains why chronic pain can persist even when structural pathology appears minimal.

4. Neuromuscular Dysfunction

Chronic low back pain is frequently associated with altered muscle activation patterns. Weakness or delayed activation of deep stabilizing muscles such as the transversus abdominis and multifidus can impair spinal stability. Compensatory muscle tension and spasms may develop, further contributing to discomfort and restricted mobility. Prolonged muscle guarding may perpetuate the pain cycle.

5. Psychosocial Influences and Pain Modulation

Psychological factors such as stress, anxiety, depression, and fear-avoidance behaviors significantly influence pain perception and chronicity. Emotional distress can enhance neural pain pathways and reduce endogenous pain inhibition mechanisms. The biopsychosocial model highlights that chronic low back pain is not purely a structural disorder but a condition shaped by cognitive, emotional, and social dimensions.

6. Neurochemical and Endogenous Pain Control

The body possesses intrinsic pain-modulating systems involving neurotransmitters such as endorphins, serotonin, and norepinephrine. In chronic conditions, dysfunction in these inhibitory pathways may reduce the body's ability to regulate pain effectively. This imbalance contributes to persistent symptoms and may explain variability in treatment response.

In summary, the pathophysiology of chronic low back pain involves a dynamic interplay between mechanical degeneration, inflammatory processes, neural sensitization, muscular dysfunction, and psychosocial influences. Recognizing these mechanisms is essential for developing comprehensive management strategies, including non-pharmacological approaches such as acupressure that may target both peripheral and central pain pathways.

Conventional Treatment Approaches and Their Limitations

Management of chronic low back pain (CLBP) typically involves a combination of pharmacological, physical, interventional, and surgical approaches. While these strategies can provide symptom relief for many patients, their effectiveness varies, and long-term outcomes are often inconsistent.

1. Pharmacological Management

Medications are commonly prescribed as first-line therapy. Nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen are widely used to reduce pain and inflammation. In more severe cases, muscle relaxants, antidepressants, or anticonvulsants may be prescribed for neuropathic components of pain. Opioids are sometimes used for short-term management in refractory cases.

Limitations:

Prolonged use of analgesics may lead to gastrointestinal, renal, or cardiovascular side effects. Opioids carry risks of tolerance, dependence, and misuse. Additionally, medications often address symptoms rather than underlying causes, offering temporary relief without improving functional capacity.

2. Physical Therapy and Exercise Programs

Rehabilitation programs focus on strengthening core muscles, improving flexibility, correcting posture, and enhancing spinal stability. Structured exercise therapy is considered one of the most evidence-supported interventions for CLBP.

Limitations:

Patient adherence can be inconsistent, especially when pain persists. Improvement may be gradual, and outcomes depend heavily on proper supervision and individual motivation. Some individuals may experience temporary exacerbation of symptoms.

3. Interventional Procedures

For patients who do not respond to conservative treatment, interventions such as epidural steroid injections, nerve blocks, or radiofrequency ablation may be considered. These procedures aim to reduce inflammation or disrupt pain signals.

Limitations:

Relief is often temporary, and repeated procedures may be required. There are potential risks, including infection, bleeding, and nerve injury. Moreover, interventional therapies do not always address broader functional or psychosocial aspects of chronic pain.

4. Surgical Interventions

Surgery, including spinal fusion or decompression procedures, is typically reserved for cases involving structural abnormalities such as severe disc herniation or spinal stenosis.

Limitations:

Surgical outcomes can vary significantly. Some patients experience persistent pain even after technically successful procedures. Surgery carries inherent risks, including complications, prolonged recovery time, and high financial costs.

5. Psychological and Behavioral Therapies

Cognitive behavioral therapy (CBT) and pain education programs are increasingly incorporated into multidisciplinary treatment plans. These approaches aim to modify pain-related beliefs and improve coping strategies.

Limitations:

Access to trained professionals may be limited in certain regions. Some patients may initially resist psychological interventions due to stigma or misunderstanding about their role in pain management.

conventional treatments provide important options for managing chronic low back pain, yet many individuals continue to experience residual symptoms, recurrence, or treatment-related adverse effects. These limitations have encouraged exploration of complementary and integrative approaches, such as acupressure, that aim to provide safe, cost-effective, and holistic pain management solutions.

Conclusion

Chronic low back pain remains a complex and persistent health concern that significantly affects physical function, emotional well-being, and overall quality of life. Its multifactorial nature, involving structural, neurological, inflammatory, and psychosocial components, makes management challenging and often requires a multidimensional treatment approach. Although conventional therapies such as medications, physical rehabilitation, interventional procedures, and surgery play an essential role in care, their outcomes are sometimes limited by side effects, high costs, or incomplete long-term relief. The growing emphasis on non-pharmacological and integrative strategies has highlighted the potential role of complementary therapies in chronic pain management. Acupressure, as a non-invasive and accessible intervention, offers promising benefits in reducing pain intensity, improving functional mobility, and enhancing patient self-efficacy. Its proposed mechanisms, including neuromodulation, improved

circulation, muscle relaxation, and stimulation of endogenous pain control pathways, align with current understandings of chronic pain physiology. While existing clinical evidence suggests positive outcomes, variability in research design, intervention protocols, and sample sizes indicates the need for more rigorous, large-scale randomized controlled trials. Standardized treatment parameters and long-term follow-up studies would further clarify its sustained efficacy and integration into evidence-based practice. acupressure represents a safe, cost-effective, and potentially valuable adjunct in the comprehensive management of chronic low back pain. Incorporating it within a multidisciplinary framework may enhance therapeutic outcomes and provide patients with a holistic pathway toward improved function and quality of life.

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