Comparative Effects of Acupressure Versus Acupuncture on Musculoskeletal Pain

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Abstract
Musculoskeletal pain is one of the leading causes of disability worldwide, affecting physical function, work productivity, and overall quality of life. Conventional management strategies include pharmacological analgesics, physical therapy, and interventional procedures; however, long-term medication use may be associated with adverse effects and incomplete symptom relief. As a result, complementary therapies such as acupressure and acupuncture have gained increasing attention in pain management. Acupuncture involves the insertion of fine needles into specific acupoints to stimulate physiological responses, whereas acupressure applies manual pressure to the same or similar points without needle penetration. Both techniques are rooted in traditional East Asian medicine and are believed to modulate pain through neurophysiological mechanisms. This comparative study examines the effectiveness of acupressure and acupuncture in alleviating musculoskeletal pain, including conditions such as low back pain, neck pain, and osteoarthritis.
Keywords: Musculoskeletal Pain; Acupressure; Acupuncture; Pain Modulation; Complementary Therapy

Introduction
Musculoskeletal pain is a major public health concern and one of the leading contributors to disability worldwide. Conditions such as low back pain, neck pain, osteoarthritis, and myofascial pain syndromes affect individuals across all age groups and significantly impair mobility, work productivity, and overall quality of life. Chronic musculoskeletal pain is often persistent and recurrent, creating both physical limitations and psychological distress. Conventional management typically includes pharmacological therapies such as nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, and opioids, along with physical therapy and exercise-based rehabilitation. While these approaches may provide symptomatic relief, long-term medication use can lead to gastrointestinal, renal, or cardiovascular side effects, as well as concerns regarding opioid dependence. Furthermore, some patients continue to experience residual pain despite standard treatment, highlighting the need for complementary or alternative interventions. Acupuncture and acupressure are therapeutic techniques derived from traditional East Asian medicine that have gained increasing recognition in integrative pain management. Acupuncture involves the insertion of fine needles into specific acupoints to stimulate physiological responses, whereas acupressure applies manual pressure to similar points without penetrating the skin. Both methods are believed to regulate the flow of energy and restore systemic balance according to traditional theory. From a biomedical perspective, they may influence neurochemical release, modulate inflammatory responses, and alter central pain-processing pathways. Although both modalities are widely used for musculoskeletal pain, comparative evidence regarding their relative effectiveness remains limited. Acupuncture is

often considered more intensive due to needle stimulation, while acupressure is non-invasive, more accessible, and suitable for self-administration. Understanding the comparative benefits and limitations of these approaches is important for guiding patient-centered treatment decisions.

Epidemiology and Global Burden of Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) represent one of the most prevalent and disabling groups of health conditions worldwide. They encompass a broad range of disorders affecting muscles, bones, joints, ligaments, and tendons, including low back pain, neck pain, osteoarthritis, rheumatoid arthritis, and soft tissue injuries. These conditions are characterized by pain, stiffness, reduced mobility, and functional limitation.

1. Global Prevalence

Epidemiological data consistently identify musculoskeletal pain as a leading cause of years lived with disability (YLDs) globally. Low back pain, in particular, ranks among the top contributors to disability across all regions and age groups. Osteoarthritis and neck pain also account for a substantial proportion of chronic pain cases.

Prevalence increases with age, but MSDs are not confined to older populations. Working-age adults frequently experience musculoskeletal pain due to occupational strain, repetitive movements, poor posture, and sedentary lifestyles.

2. Age and Gender Patterns

The burden of musculoskeletal disorders rises with population aging, as degenerative joint changes and cumulative mechanical stress become more pronounced. Women tend to report higher rates of certain conditions, such as osteoarthritis and chronic neck pain, potentially due to hormonal influences, anatomical differences, and psychosocial factors.

3. Occupational and Lifestyle Risk Factors

Modern work environments contribute significantly to the rising incidence of MSDs. Prolonged sitting, repetitive manual tasks, heavy lifting, and poor ergonomic design increase mechanical stress on the spine and joints. Additionally, physical inactivity, obesity, and lack of muscle conditioning further elevate risk.

In developing regions, physically demanding labor remains a major contributing factor, while in urbanized societies, sedentary habits and screen-based work are key drivers.

4. Economic and Social Impact

The global burden of musculoskeletal disorders extends beyond physical discomfort. Direct healthcare costs include physician consultations, imaging studies, medications, rehabilitation services, and surgical interventions. Indirect costs arise from absenteeism, reduced productivity, disability compensation, and early retirement.

Chronic pain also affects psychological well-being, increasing the risk of anxiety, depression, and social withdrawal. Functional impairment may limit independence and reduce participation in daily activities.

5. Public Health Significance

With increasing life expectancy and aging populations worldwide, the prevalence of musculoskeletal disorders is expected to continue rising. Their chronic and recurrent nature places sustained pressure on healthcare systems and economies.

musculoskeletal disorders represent a major global health challenge due to their high prevalence, long-term disability, and socioeconomic impact. Understanding this burden underscores the importance of effective and accessible management strategies, including complementary approaches such as acupressure and acupuncture, in reducing pain and improving functional outcomes.

Conventional Treatment Approaches and Their Limitations

Management of musculoskeletal disorders typically involves a combination of pharmacological, physical, and interventional strategies aimed at reducing pain, improving mobility, and restoring function. While these approaches are widely used and often beneficial, they may not fully address chronic symptoms and can be associated with notable limitations.

1. Pharmacological Therapy

Common medications include nonsteroidal anti-inflammatory drugs (NSAIDs), acetaminophen, muscle relaxants, and, in some cases, opioids. NSAIDs are frequently prescribed to reduce inflammation and pain, particularly in conditions such as osteoarthritis and acute low back pain. Muscle relaxants may be used for spasm-related discomfort, while opioids are sometimes reserved for severe or refractory pain.

Limitations:

Long-term NSAID use may lead to gastrointestinal irritation, renal impairment, and cardiovascular risks. Opioids carry concerns of tolerance, dependence, sedation, and respiratory depression. Pharmacological treatments often provide symptomatic relief without addressing underlying mechanical or functional causes.

2. Physical Therapy and Exercise-Based Rehabilitation

Physical therapy focuses on strengthening, stretching, posture correction, and functional training. Exercise programs are widely recommended to improve joint stability, muscle endurance, and overall mobility.

Limitations:

Effectiveness depends heavily on patient adherence and proper technique. Some individuals may experience temporary increases in pain during early rehabilitation. Access to trained professionals and ongoing sessions may also present financial or logistical barriers.

3. Interventional Procedures

In cases of persistent pain, interventions such as corticosteroid injections, nerve blocks, or radiofrequency ablation may be considered. These procedures aim to reduce inflammation or disrupt pain transmission pathways.

Limitations:

Relief is often temporary, and repeated procedures may be necessary. Potential risks include infection, tissue damage, and procedural complications. These approaches do not always address central pain sensitization or psychosocial contributors.

4. Surgical Management

Surgery may be recommended for structural abnormalities such as severe osteoarthritis, spinal stenosis, or herniated discs. Procedures include joint replacement, spinal fusion, or decompression surgeries.

Limitations:

Surgical outcomes vary, and recovery periods can be lengthy. Complications, persistent pain,

or recurrence may occur. Surgery also carries significant financial cost and is typically reserved for advanced cases.

5. Psychosocial and Behavioral Interventions

Chronic musculoskeletal pain often includes psychological components such as fear-avoidance behavior, anxiety, or depression. Cognitive behavioral therapy and pain education programs are sometimes integrated into treatment plans.

Limitations:

Availability of trained professionals may be limited, and patient engagement varies. Behavioral interventions may not directly relieve acute nociceptive pain.

conventional treatments play an essential role in managing musculoskeletal disorders, yet they may be limited by side effects, incomplete long-term relief, and high costs. These challenges have encouraged exploration of complementary and integrative therapies, including acupressure and acupuncture, as supportive options within comprehensive pain management frameworks.

Conclusion

Musculoskeletal disorders represent a major global health burden, contributing significantly to chronic pain, disability, and reduced quality of life. Their multifactorial nature, involving mechanical strain, inflammation, neural sensitization, and psychosocial influences, makes management complex and often prolonged. Conventional treatments, including pharmacological therapy, physical rehabilitation, interventional procedures, and surgery, remain central to care but are frequently limited by side effects, incomplete symptom resolution, and financial costs. Complementary approaches such as acupressure and acupuncture offer promising alternatives or adjuncts within an integrative pain management framework. Both modalities aim to modulate pain pathways, enhance endogenous opioid release, regulate inflammatory responses, and influence central nervous system processing. While acupuncture may provide deeper stimulation through needle insertion, acupressure offers the advantages of being non-invasive, accessible, and suitable for self-administration in appropriate cases. Comparative evidence suggests that both techniques can effectively reduce pain intensity and improve functional outcomes in musculoskeletal conditions. The choice between them may depend on patient preference, clinical context, availability of trained practitioners, and safety considerations. Further high-quality randomized controlled trials are needed to clarify relative efficacy, optimal treatment frequency, and long-term benefits. Integrating acupressure and acupuncture into multidisciplinary care models may enhance patient-centered outcomes and provide a more holistic approach to managing musculoskeletal pain.

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