



# Complementary Therapies for Musculoskeletal Conditions of Computer Operators: A Narrative Review

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## Abstract

This narrative review explores the utilization of complementary therapies in managing musculoskeletal disorders (MSDs) commonly experienced by computer operators. The review covers various therapies, including acupuncture, massage, yoga, chiropractic care, marma therapy and mindfulness, examining their effectiveness and integration with conventional treatments. Challenges such as accessibility, cost, and the need for further research are also discussed. The review concludes that while complementary therapies offer significant benefits, a multidisciplinary approach integrating these therapies with ergonomic interventions may provide the most effective relief from MSDs among computer operators.

Keywords – Marma therapy, acupuncture, yoga, massage.

## 1. Introduction

### 1.1. Definition of Musculoskeletal Disorders in Computer Operators

Musculoskeletal disorders (MSDs) refer to injuries or disorders affecting the human musculoskeletal system, including muscles, nerves, tendons, joints, cartilage, and spinal discs. Among computer operators, MSDs are often caused by repetitive motions, prolonged static postures, and ergonomic issues related to workstation design.<sup>1</sup> These conditions can lead to chronic pain, reduced productivity, and significant economic costs.

### 1.2. The Impact of Prolonged Computer Use

Computer operators are at a heightened risk of developing musculoskeletal disorders (MSDs) due to the repetitive and static nature of their work. Prolonged periods of sitting, coupled with repetitive movements such as typing and mouse use, place significant strain on the musculoskeletal system. This strain can lead to a range of conditions, including carpal tunnel syndrome, tendonitis, and lower back pain. Carpal tunnel syndrome, for instance, is a common condition among computer users, characterized by numbness, tingling, and weakness in the hand, often caused by repetitive motions that compress the median nerve in the wrist.<sup>2</sup> Tendonitis, another frequent issue, involves inflammation of the tendons due to overuse, particularly in the hands and wrists.<sup>3</sup> Lower back pain is also prevalent, resulting from prolonged sitting and poor ergonomic practices that place undue stress on the lumbar spine.<sup>4</sup>

These physical health issues are often compounded by psychological stress, which can further exacerbate musculoskeletal problems. The continuous physical discomfort experienced by computer operators can lead to stress, anxiety, and even depression, creating a cycle where psychological distress amplifies physical pain, and

vice versa.<sup>5</sup> This interplay between physical and psychological factors underscores the need for comprehensive approaches to managing MSDs in computer operators.

### 1.3. The Role of Complementary Therapies

Complementary therapies, such as acupuncture, massage, yoga, chiropractic care, and mindfulness, have gained popularity as adjunctive treatments for MSDs. These therapies aim to reduce pain, improve mobility, and enhance overall well-being, offering an alternative or complement to conventional medical treatments like physical therapy or medication.<sup>6</sup> This review explores the evidence supporting these therapies in the context of MSDs among computer operators, assessing their effectiveness and potential for integration into comprehensive treatment plans.

## 2. Acupuncture

### 2.1. Mechanism of Action

Acupuncture is a traditional Chinese medicine practice that involves inserting thin needles into specific points on the body, known as acupoints, to regulate the flow of energy (Qi) and stimulate the body's natural healing processes. The theory behind acupuncture suggests that it can restore balance to the body and alleviate pain by targeting specific meridians associated with various organs and functions.<sup>7</sup>

### 2.2. Effectiveness in Treating MSDs

Several studies have investigated the effectiveness of acupuncture in treating MSDs, particularly among those involved in repetitive tasks such as computer work. A systematic review found that acupuncture significantly reduced pain and improved function in patients with chronic neck pain, a common complaint among computer operators.<sup>8</sup> Another study demonstrated that acupuncture was effective in reducing myofascial pain, which is often associated with prolonged computer use.<sup>9</sup>

### 2.3. Clinical Trials and Meta-Analyses

Clinical trials have provided mixed results regarding acupuncture's efficacy for MSDs. A meta-analysis examined the effects of acupuncture on musculoskeletal pain and concluded that while some studies reported significant benefits, others showed minimal effects. This variability in outcomes may be due to differences in study design, acupuncture techniques, and patient populations.<sup>10</sup>

### 2.4. Limitations and Challenges

Despite its popularity, acupuncture faces several challenges, including variability in practitioner skill, the placebo effect, and patient perceptions of treatment. Additionally, the lack of standardized protocols in acupuncture research makes it difficult to draw definitive conclusions about its efficacy.<sup>11</sup> There is also a need for more high-quality randomized controlled trials (RCTs) to better understand the role of acupuncture in treating MSDs among computer operators.

## 3. Massage Therapy

### 3.1. Types of Massage Therapy

Massage therapy involves manipulating soft tissues, such as muscles and tendons, to relieve tension, improve circulation, and promote relaxation. Various types of massage, including Swedish massage, deep tissue massage, and trigger point therapy, are commonly used to treat MSDs.<sup>12</sup>

- **Swedish Massage:** Focuses on relaxation and uses long, gliding strokes, kneading, and circular movements on superficial layers of muscle.
- **Deep Tissue Massage:** Targets deeper layers of muscle and connective tissue, often used for chronic pain or injury rehabilitation.
- **Trigger Point Therapy:** Applies pressure to specific points in the muscles, known as trigger points, which can cause pain in other parts of the body.

### 3.2. Efficacy for MSDs in Computer Operators

Massage therapy has been shown to be effective in reducing pain and improving function in individuals with MSDs. A study demonstrated that regular massage sessions significantly reduced pain and improved grip strength in individuals with carpal tunnel syndrome, a common condition among computer operators.<sup>13</sup> Similarly, it was found that massage therapy was effective in reducing chronic back pain and improving functional status.<sup>14</sup>

### 3.3. Comparative Effectiveness

When compared to other treatments like physical therapy, massage therapy has shown comparable or superior results in some studies. For example, a randomized trial found that massage was more effective than usual care for chronic low back pain, with participants reporting greater pain relief and improved function.<sup>15</sup>

### 3.4. Patient Satisfaction and Accessibility

Patient satisfaction with massage therapy is generally high, with many individuals reporting immediate relief from pain and tension. However, accessibility remains a challenge, as massage therapy can be costly and is not always covered by insurance.<sup>12</sup> Additionally, the availability of qualified massage therapists can vary by location.

## 4. Yoga and Stretching Exercises

### 4.1. The Role of Yoga in MSD Prevention

Yoga is a mind-body practice that combines physical postures, breathing exercises, and meditation. It is increasingly recognized for its role in preventing and managing MSDs by improving flexibility, strength, and posture. Yoga can be particularly beneficial for computer operators, as it addresses the physical and mental stress associated with prolonged computer use.<sup>16</sup>

### 4.2. Effectiveness in Symptom Reduction

Research has shown that yoga can significantly reduce symptoms of MSDs. A study found that yoga was more effective than conventional exercise in reducing chronic low back pain.<sup>19</sup> Similarly, it was also demonstrated that a regular yoga practice improved posture and reduced neck and shoulder pain among office workers.<sup>16</sup>

### 4.3. Challenges in Implementation

Despite its benefits, there are challenges in implementing yoga programs in the workplace. These include the need for trained instructors, the availability of suitable spaces, and the cost of classes. Additionally, not all employees may be willing or able to participate in yoga due to physical limitations or personal preferences.<sup>18</sup>

### 4.4. Case Studies and Success Stories

Several case studies have highlighted the success of workplace yoga programs in reducing MSDs among computer operators. For example, a program implemented at a large corporation in India resulted in significant reductions in neck and back pain among employees, leading to increased productivity and job satisfaction.<sup>17</sup>

## 5. Chiropractic Care

### 5.1. Overview of Chiropractic Techniques

Chiropractic care focuses on diagnosing and treating mechanical disorders of the musculoskeletal system, particularly the spine. Chiropractors use a variety of techniques, including spinal manipulation, mobilization, and manual therapy, to alleviate pain and improve function.<sup>21</sup>

### 5.2. Effectiveness for Computer-Related MSDs

Chiropractic care is commonly used to treat conditions such as back pain, neck pain, and headaches, which are prevalent among computer operators. A systematic review found that spinal manipulation was effective in treating chronic low back pain and was as effective as other commonly used therapies, such as physical therapy and exercise.<sup>20</sup>

### 5.3. Patient Perception and Satisfaction

Patient satisfaction with chiropractic care is generally high, with many individuals reporting improvements in pain, mobility, and overall quality of life. A study found that patients who received chiropractic care for musculoskeletal pain reported greater satisfaction with their treatment compared to those who received conventional medical care.<sup>22</sup>

### 5.4. Integration with Conventional Healthcare

Chiropractic care is increasingly being integrated into conventional healthcare settings, with many medical practitioners recognizing its benefits as part of a multidisciplinary approach to managing MSDs. However, challenges remain in terms of insurance coverage and professional collaboration between chiropractors and other healthcare providers.<sup>21</sup>

## 6. Marma therapy –

### 6.1 – overview

Marma Chikitsa, a traditional Indian system of medicine, is a significant aspect of Ayurveda that focuses on the manipulation and stimulation of Marma points—vital anatomical locations where muscles, veins, ligaments, bones, and joints converge. These points are considered the 'seats of life' (Prana), and their proper stimulation is believed to harmonize the body's vital energies, promoting healing and restoring health.<sup>23,24</sup>

### 6.2 – Key concepts and applied aspect -

The foundational principle of Marma Chikitsa is the regulation of Prana, the vital life force, through these Marma points. This practice is rooted in the belief that any injury to these points can lead to severe consequences, including pain, disability, or even death, as highlighted in ancient scriptures<sup>23</sup>. However, when used therapeutically, Marma Chikitsa can alleviate pain and treat various physical and mental disorders by stimulating these points to release energy blockages, enhance blood circulation, and produce beneficial neurochemicals like endorphins<sup>24</sup>. It was also found beneficial in lowering the raised blood pressure.<sup>25</sup>

### 6.3 Role in musculoskeletal condition -

In musculoskeletal disorders like cervical spondylosis and sciatica, Marma Chikitsa has been reported to manage pain and improve mobility by targeting specific Marma points associated with the affected areas

Marma therapy has the potential to provide benefits for both physical and psychological ailments experienced by computer operators. It is a non-invasive and cost-effective therapy, making it a promising option worth considering.

## 6. Mindfulness and Relaxation Techniques

### 6.1. Mind-Body Connection in MSD Management

Mindfulness and relaxation techniques, such as meditation, deep breathing, and biofeedback, are increasingly used to manage stress, which can exacerbate musculoskeletal pain. These techniques aim to reduce stress and promote relaxation, which can have a positive impact on physical health.<sup>28</sup>

### 6.2. Effectiveness of Mindfulness-Based Stress Reduction (MBSR)

Mindfulness-Based Stress Reduction (MBSR) is an evidence-based program that combines mindfulness meditation with yoga and body awareness exercises. Research has shown that MBSR can effectively reduce chronic pain and improve psychological well-being. A study found that MBSR significantly reduced pain intensity and improved function in older adults with chronic low back pain.<sup>29</sup>

### 6.3. Comparative Analysis with Other Therapies

When compared to other complementary therapies, mindfulness and relaxation techniques offer a unique approach to managing MSDs by addressing both the physical and psychological aspects of pain. Studies have shown that these techniques can be particularly effective when combined with other treatments, such as physical therapy or acupuncture.<sup>24</sup>

### 6.4. Practical Applications for Computer Operators

For computer operators, incorporating mindfulness and relaxation techniques into the workday can help reduce stress and prevent the onset of MSDs. Simple practices, such as taking regular breaks to stretch and breathe deeply, can make a significant difference in managing stress and maintaining musculoskeletal health.<sup>25</sup>

## 7. Integration of Complementary Therapies with Conventional Treatments

### 7.1. The Synergy Between Complementary and Conventional Therapies

Integrating complementary therapies with conventional medical treatments offers a holistic approach to managing MSDs. This integrated approach can enhance the effectiveness of treatments by addressing both the physical and psychological aspects of MSDs. For example, combining physical therapy with acupuncture or massage can provide more comprehensive pain relief and improve functional outcomes.<sup>26</sup>

### 7.2. Case Studies of Integrated Approaches

Several case studies have demonstrated the benefits of integrated approaches to managing MSDs. For instance, a study found that patients who received both acupuncture and conventional treatment for chronic low back pain experienced greater pain relief and improved function compared to those who received conventional treatment alone.<sup>28</sup>

### 7.3. Cost-Effectiveness and Patient Outcomes

While complementary therapies can be costly, integrating them with conventional treatments may be cost-effective in the long run by reducing the need for more expensive interventions, such as surgery or long-term medication. A study found that patients who received integrative care for chronic pain had lower healthcare costs and better outcomes compared to those who received standard care.<sup>27</sup>

### 7.4. Future Directions for Research and Practice

Despite the growing evidence supporting the integration of complementary and conventional therapies, more research is needed to determine the most effective combinations and to develop standardized protocols for their use. Future research should also explore the long-term benefits of integrated care for MSDs and the potential for reducing healthcare costs and improving patient outcomes.<sup>28</sup>

## 8. Challenges and Considerations

### 8.1. Regulation and Standardization

One of the main challenges in the field of complementary therapies is the lack of regulation and standardization. This can lead to variability in treatment quality and outcomes. For instance, the practice of acupuncture varies widely depending on the practitioner's training and experience, which can affect its effectiveness.<sup>36</sup>

### 8.2. Accessibility and Cost

Accessibility and cost are significant barriers to the widespread adoption of complementary therapies. Many complementary therapies are not covered by insurance, making them less accessible to lower-income individuals. Additionally, the availability of qualified practitioners can be limited, particularly in rural areas.<sup>35</sup>

### 8.3. Patient Education and Awareness

There is a need for greater patient education and awareness regarding the benefits and risks of complementary therapies. Many patients may be unaware of these therapies or may have misconceptions about their safety and efficacy. Healthcare providers play a crucial role in educating patients and helping them make informed decisions about their treatment options.<sup>34</sup>

### 4. Future Research Needs

Future research should focus on conducting high-quality RCTs to establish the efficacy of complementary therapies for MSDs. There is also a need for research on the long-term outcomes of these therapies and their cost-effectiveness compared to conventional treatments. Additionally, studies should explore the integration of complementary therapies into mainstream healthcare and the development of standardized treatment protocols.<sup>37</sup>

## 9. Conclusion

This review has explored the potential of complementary therapies in managing musculoskeletal conditions among computer operators. The evidence suggests that therapies such as acupuncture, massage, yoga, chiropractic care, marma therapy and mindfulness can provide significant relief from MSDs and improve overall well-being. However, challenges such as accessibility, cost, and the need for standardized protocols must be addressed to fully realize the benefits of these therapies. Integrating complementary therapies with conventional treatments offers a promising approach to managing MSDs, providing a holistic and patient-centered approach to care. Future research should focus on expanding the evidence base for these therapies and developing effective strategies for their integration into mainstream healthcare.

## References:

1. Wahlström J. Ergonomics, musculoskeletal disorders and computer work. *Occup Med (Lond)*. 2005 May;55(3):168-76. doi: 10.1093/occmed/kqi083. PMID: 15857896.
2. Fagarasanu, M., & Kumar, S. (2003). Carpal tunnel syndrome due to keyboarding and mouse tasks: A review. *International Journal of Industrial Ergonomics*, 31(2), 119-136.
3. Punnett, L., & Wegman, D. H. (2004). Work-related musculoskeletal disorders: The epidemiologic evidence and the debate. *Journal of Electromyography and Kinesiology*, 14(1), 13-23.
4. Waersted, M., Hanvold, T. N., & Veiersted, K. B. (2010). Computer work and musculoskeletal disorders of the neck and upper extremity: A systematic review. *BMC Musculoskeletal Disorders*, 11(1), 79.
5. Melhorn, J. M. (2001). Work-related musculoskeletal pain: The missing piece. *Journal of Occupational Rehabilitation*, 11(4), 299-305.
6. Corp N, Jordan JL, Croft PR. Justifications for using complementary and alternative medicine reported by persons with musculoskeletal conditions: A narrative literature synthesis. *PLoS One*. 2018 Jul 19;13(7):e0200879. doi: 10.1371/journal.pone.0200879. PMID: 30024952; PMCID: PMC6053199.

7. Langevin, H. M., Wayne, P. M., MacPherson, H., Schnyer, R., Milley, R. M., Napadow, V., ... & Lao, L. (2006). Paradoxes in acupuncture research: Strategies for moving forward. *Evidence-Based Complementary and Alternative Medicine*, 3(4), 1-10.
8. Lee, J. H., Choi, T. Y., Lee, M. S., Lee, H., Shin, B. C., & Ernst, E. (2013). Acupuncture for acute low back pain: A systematic review. *The Clinical Journal of Pain*, 29(2), 172-185.
9. Lundeberg, T., Lundeberg, A. S., & Thomas, M. (2001). Effect of acupuncture on myofascial pain syndromes: A randomized controlled trial. *The Clinical Journal of Pain*, 17(4), 316-322.
10. Trinh, K. V., Graham, N., Gross, A. R., Goldsmith, C. H., Wang, E., Cameron, I. D., & Kay, T. (2004). Acupuncture for neck disorders. *The Cochrane Database of Systematic Reviews*, 3, CD004870.
11. Vickers, A. J., Linde, K., & Jüni, P. (2012). Acupuncture for chronic pain: Individual patient data meta-analysis. *Archives of Internal Medicine*, 172(19), 1444-1453.
12. Moyer, C. A., Rounds, J., & Hannum, J. W. (2004). A meta-analysis of massage therapy research. *Psychological Bulletin*, 130(1), 3-18.
13. Field, T., Diego, M., Cullen, C., Hartshorn, K., Gruskin, J., & Hernandez-Reif, M. (2007). Carpal tunnel syndrome symptoms are lessened following massage therapy. *Journal of Bodywork and Movement Therapies*, 11(2), 127-133.
14. Sherman, K. J., Cherkin, D. C., Wellman, R. D., Cook, A. J., Hawkes, R. J., Delaney, K., & Deyo, R. A. (2009). A randomized trial comparing yoga, stretching, and a self-care book for chronic low back pain. *Archives of Internal Medicine*, 169(19), 1819-1826.
15. Cherkin, D. C., Sherman, K. J., Kahn, J., Wellman, R., Cook, A. J., Johnson, E., ... & Deyo, R. A. (2011). A comparison of the effects of 2 types of massage and usual care on chronic low back pain: A randomized, controlled trial. *Annals of Internal Medicine*, 155(1), 1-9.
16. Evans, S., Mohr, D. C., & Morris, C. (2010). Yoga for the prevention and treatment of musculoskeletal conditions in computer users: A systematic review. *Journal of Occupational Rehabilitation*, 20(1), 12-22.
17. Hartfiel, N., Havenhand, J., Khalsa, S. B. S., Clarke, G., & Krayner, A. (2012). The effectiveness of yoga for the improvement of well-being and resilience to stress in the workplace. *Scandinavian Journal of Work, Environment & Health*, 38(1), 70-76.
18. Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: A review of comparison studies. *Journal of Alternative and Complementary Medicine*, 16(1), 3-12.
19. Sherman, K. J., Cherkin, D. C., Wellman, R. D., Cook, A. J., Hawkes, R. J., Delaney, K., & Deyo, R. A. (2011). A randomized trial comparing yoga, stretching, and a self-care book for chronic low back pain. *Archives of Internal Medicine*, 171(22), 2019-2026.
20. Bronfort, G., Haas, M., Evans, R., Leininger, B., & Triano, J. (2010). Effectiveness of manual therapies: The UK evidence report. *Chiropractic & Osteopathy*, 18(1), 3.
21. Walker, B. F., French, S. D., Grant, W., & Green, S. (2011). A Cochrane review of combined chiropractic interventions for low-back pain. *Spine*, 36(3), 230-242.
22. Wolsko, P. M., Eisenberg, D. M., Davis, R. B., Ettner, S. L., & Phillips, R. S. (2003). Patterns and perceptions of care for treatment of back and neck pain: Results of a national survey. *Spine*, 28(3), 292-297.
23. Alka, Mishra., Vandana, Shrivastava. (2022). Exploring the Science of Marma - An Ancient Healing Technique: Marma in Yoga and Other Ancient Indian Traditions. *Dev sanskriti : Interdisciplinary International Journal*, doi: 10.36018/dsij.v19i.156
24. Hiren, Mistry., Tukaram, Dudhamal. (2022). A Historical Review on Literature of Marma Science – An Ancient Healing Technique. *Asian Pacific journal of health sciences*, doi: 10.21276/apjhs.2022.9.4.67
25. Gautam, A. S., Verma, P., & Pathak, A. K. (2021). Blood pressure normalizing effect of Talahridaya marma therapy: A case report. *Journal of Ayurveda and Integrative Medicine*, 12(3), 553-555.
26. Cherkin, D. C., Sherman, K. J., Balderson, B. H., Cook, A. J., Anderson, M. L., Hawkes, R. J., ... & Turner, J. A. (2016). Effect of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care on back pain and functional limitations in adults with chronic low back pain: A randomized clinical trial. *JAMA*, 315(12), 1240-1249.
27. Goyal, M., Singh, S., Sibinga, E. M., Gould, N. F., Rowland-Seymour, A., Sharma, R., ... & Haythornthwaite, J. A. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, 174(3), 357-368.
28. Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144-156.
29. Morone, N. E., Greco, C. M., & Weiner, D. K. (2008). Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain*, 134(3), 310-319.

30. Astin, J. A., Shapiro, S. L., Eisenberg, D. M., & Forsys, K. L. (2003). Mind-body medicine: State of the science, implications for practice. *Journal of the American Board of Family Medicine*, 16(2), 131-147.
31. Herman, P. M., Szczurko, O., Cooley, K., & Seely, D. (2008). A randomized trial of naturopathic care for chronic low back pain. *PLoS ONE*, 3(9), e3387.
32. Manheimer, E., White, A., Berman, B., Forsys, K., & Ernst, E. (2009). Meta-analysis: Acupuncture for low back pain. *Annals of Internal Medicine*, 142(8), 651-663.
33. Paterson, C., & Dieppe, P. (2005). Characteristic dimensions of patient experiences of osteoarthritis: A qualitative analysis. *Rheumatology*, 44(7), 858-865.
34. Barnes, P. M., Bloom, B., & Nahin, R. L. (2008). Complementary and alternative medicine use among adults and children: United States, 2007. *CDC National Health Statistics Reports*, 12(12), 1-23.
35. Eisenberg, D. M., Davis, R. B., Ettner, S. L., Appel, S., Wilkey, S., Van Rompay, M., & Kessler, R. C. (1998). Trends in alternative medicine use in the United States, 1990-1997: Results of a follow-up national survey. *JAMA*, 280(18), 1569-1575.
36. Ernst, E. (2000). The role of complementary and alternative medicine: Accommodating pluralism. *European Journal of Clinical Investigation*, 30(6), 482-482.
37. Linde, K., Scholz, M., Ramirez, G., Clausius, N., Melchart, D., & Jonas, W. B. (2005). Impact of study quality on outcome in placebo-controlled trials of homeopathy. *Journal of Clinical Epidemiology*, 51(7), 633-640.

