

# The Yoga Brain Connection: A Neuroscientific Approach to Chronic Back Pain Management

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## Introduction

Low back pain (LBP) is a prevalent and possibly debilitating healthcare issue globally.<sup>1</sup> According to the 2017 Global Burden of Disease survey, which included 354 disorders across 195 countries, it ranks in the top four factors contributing to years lived with disability.<sup>2</sup> Nearly 60% of Indians have LBP at some point in their lives, indicating the disease's alarming prevalence.<sup>2</sup> According to a recent community-based study, the estimated lifetime, point and one-year prevalence (95% CI) of LBP in India are 57% (54–59%), 32% (28–30%) and 48% (46–51%), respectively.<sup>3</sup>

## Neuroscientific Approach to Back Pain Management

Chronic low back pain (CLBP) is a multifaceted condition that impacts a person's biological, psychological, social, functional and financial elements of their lives. Notably, 25% of individuals with CLBP report having depressive symptoms.<sup>4</sup> Empirical data supports the hypothesis that the brain functions as the primary nerve centre, coordinating messages to various bodily organs and systems and impacting vital functions like immune response, inflammation, hormone synthesis and heart rate. Furthermore, it has been demonstrated that the release of neurotransmitters and neuropeptides in reaction to our emotional and psychological conditions directly affects our general physiological health. The improvement of physical function and the modification of pain perception pathways may work in concert to treat persistent LBP, according to a recent study.<sup>5</sup>

Long-term pain can cause structural and functional changes in the brain, which can affect how the brain interprets and interprets pain signals. Comprehending these neuroplastic alterations becomes imperative in devising all-encompassing approaches to address and proficiently handle back discomfort. For CLBP, there are many different management options available, still, it is usually insufficient or subpar.

Most of these modalities seem to mainly focus on the biomedical aspect of pain and overlook the mind-body component and biopsychosocial model.<sup>6</sup>

Yoga has become well-known as a type of contemplative therapy that connects the body and the mind. The mind and body connection intricate interactions between our mental and emotional emotions and our physical health. According to this dynamic relationship, our physical health can affect our mental and emotional states and, in turn, our thoughts, feelings and attitudes can affect our physical health. Current research in fields such as psychology, neuroscience and neuroimmunology has shown the tangible relationships among our emotions, cognitive processes and physiological systems.

Yoga was developed more than 5,000 years ago in India with the intention of using movement and physical exercise to establish a connection between human and universal consciousness. It is among the best strategies for establishing a mind-body connection. A growing body of research, including randomised controlled trials,<sup>7–9</sup> systematic reviews,<sup>10</sup> meta-analyses and clinical guidelines,<sup>11</sup> has established yoga as a potentially helpful adjunctive treatment for CLBP. Furthermore, new research indicates that yoga poses that include meditation, which raises levels of neurotransmitters including endorphins, gamma-aminobutyric acid and melatonin. Recent research suggests that these neurochemical alterations contribute to decreased mental stress and related adverse effects linked with CLBP.<sup>12</sup> Practicing yoga poses improves balance, joint flexibility and muscle strength in those with CLBP in addition to relieving CLBP.

The mind-body stress release (MBSR) therapy is useful for individuals with CLBP who are vulnerable to psychological and sociological influences.<sup>8</sup> Developed on the foundation of

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MBSR, the integrated approach of yoga therapy (IAYT) offers a unique perspective and a complementary combination that may be helpful for the effective treatment of CLBP.<sup>8</sup> This method offers a comprehensive viewpoint for addressing the challenges related to CLBP and presents an extensive strategy that goes beyond traditional therapies.<sup>13–15</sup>

## Conclusion

Overall, the neuro-scientific viewpoint emphasises the complex connection between anatomical and functional alterations in the brain and CLBP. Conventional therapies frequently fail to address the mind-body connection that is essential to the management of CLBP. Yoga with its roots in ancient practices, presents itself as a possible complementary therapy that promotes a comprehensive approach that takes into account both psychological and physical components. It is further enhanced by the integration of MBSR and IAYT, which acknowledges the connection between emotional well-being and physical health.

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