

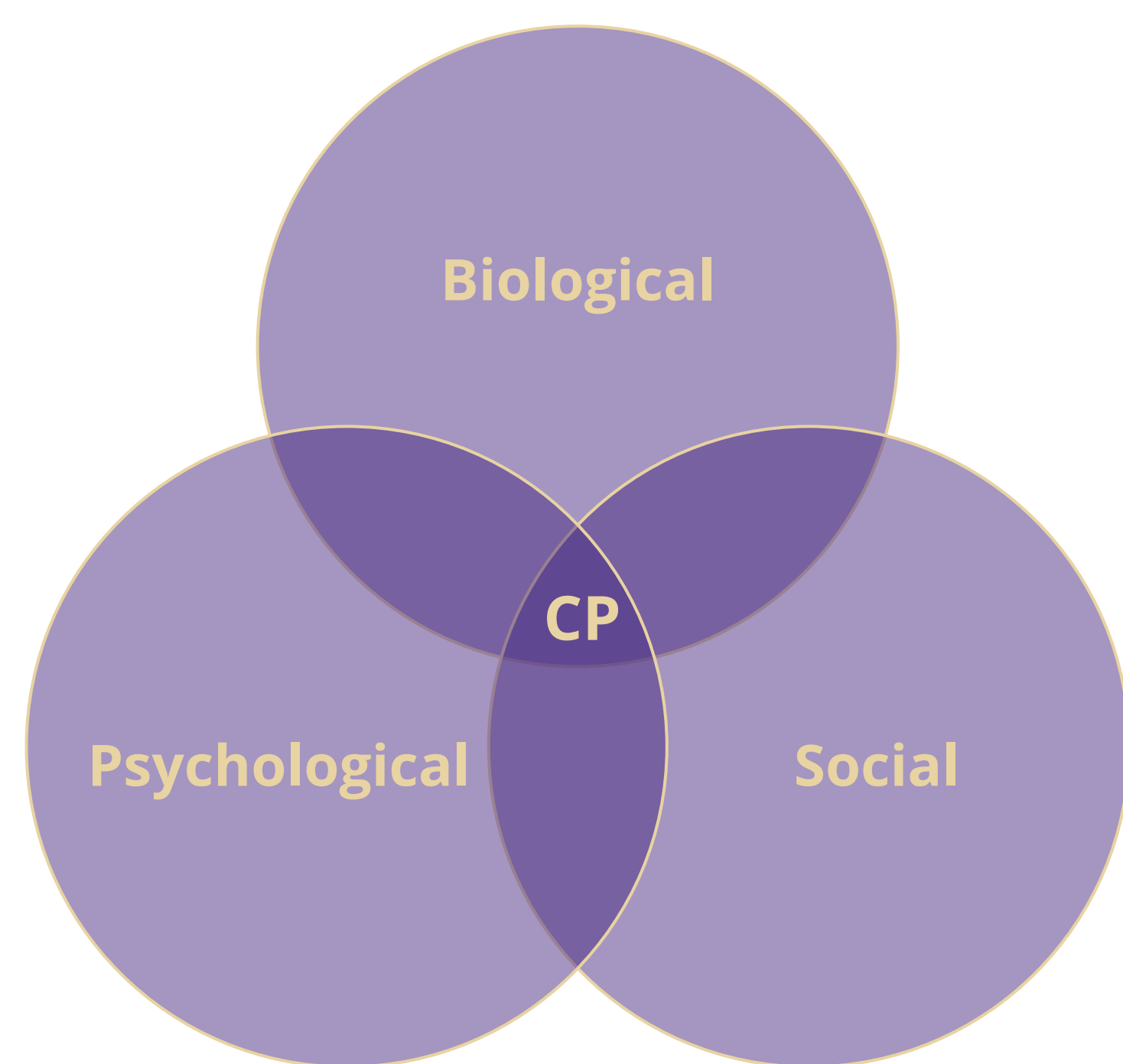
Personalized Multimodal Treatments to Improve Chronic Pain Management



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Background

- Chronic pain (CP), defined as pain lasting more than three months (Rikard 2023), affects approximately one in ten adults globally and poses a significant public health challenge due to its potential to cause long-term disability and its impact on quality of life (Goldberg and McGee 2011).



- Since CP often encompasses emotional and psychological challenges in addition to physical symptoms (Anekar and Cascella 2023), effective management may require a personalized, multimodal approach that integrates tailored pharmacological treatments for specific pain types, such as chronic nociceptive or neuropathic pain, with non-pharmacological interventions to ensure comprehensive, patient-centered care.
- The research aims to explore the effectiveness of both pharmacological treatments, including traditional and adjuvant analgesics, and non-pharmacological interventions in managing CP.
- The focus will be on how these approaches can complement each other to reduce pain, provide sustained relief, and ultimately help individuals affected by CP regain function and quality of life.

Methods

- Comprehensive research of 40 primary and secondary peer-reviewed journal articles was conducted on various chronic pain treatments and pain management strategies.

CP Treatment Options

- Traditional Analgesics (non-opioid and opioids analgesics)
- Adjuvant Analgesics (antiepileptic drugs, antidepressants, etc.)
- Non-Pharmacological Interventions (physical and psychological therapies, etc.)

Non-Opioid and Opioids

- Non-opioid, such as non-steroidal anti-inflammatory drugs and acetaminophen, are often effective for managing mild to moderate pain, but long-term use, particularly when combined with opioids, can lead to serious side effects (Anekar and Cascella 2023).
- Opioids are effective for severe pain but carry a substantial risk of misuse, dependence, and other adverse outcomes (Anekar and Cascella 2023).

Antiepileptic Drugs (AEDs)

- AEDs, such as Gabapentin and Pregabalin, work by binding to calcium channels, regulating calcium influx, and modulating GABAergic neurotransmission involved in pain signaling, with clinical studies showing they can significantly reduce the intensity of various types of neuropathic pain by 50% or more in some patients (Wiffen et al. 2013).
- However, their use is associated with risks, as higher doses increase the likelihood of adverse events, while lower doses may lack efficacy, potentially diminishing the overall benefits of treatment.

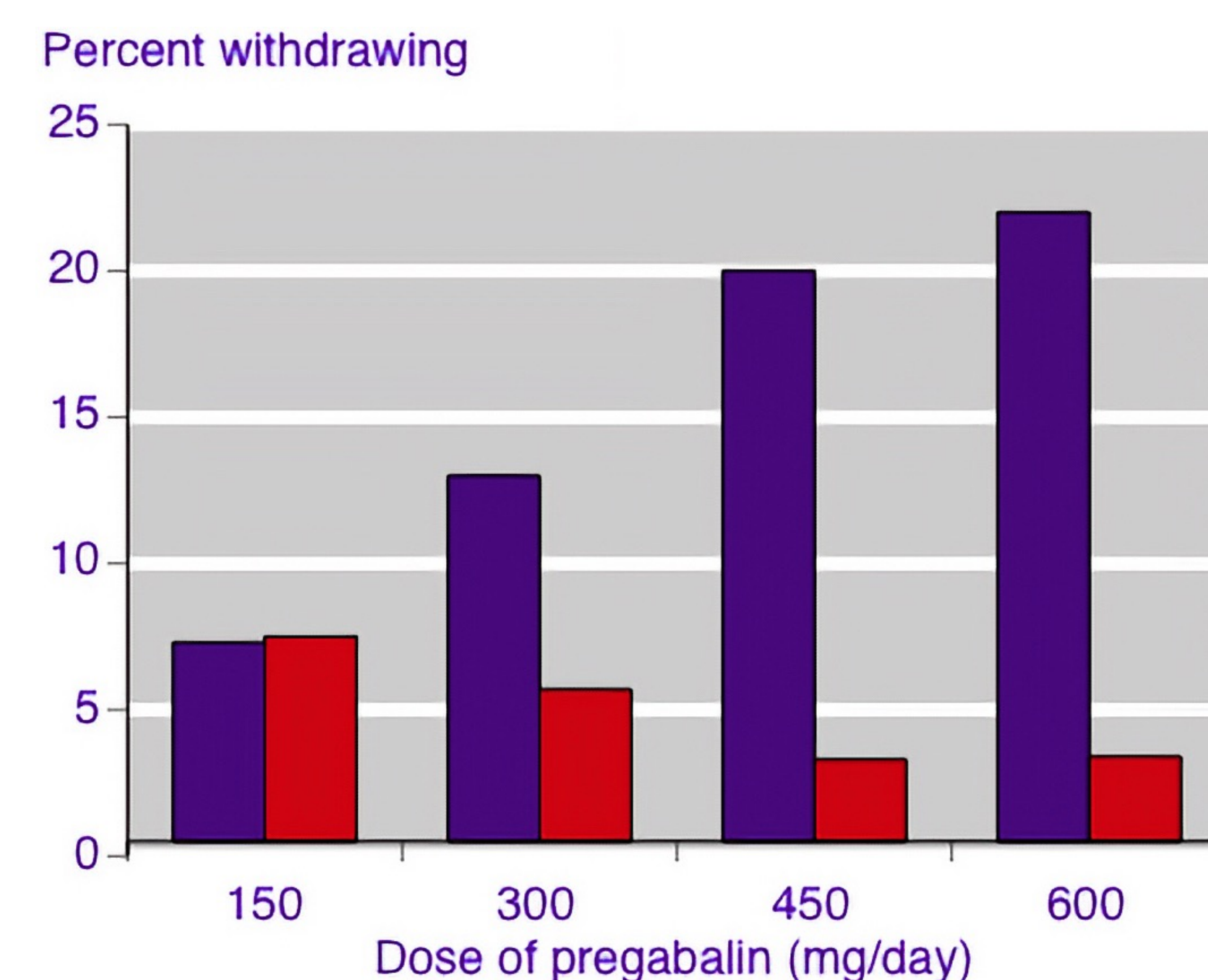


Figure 1. Withdrawals due to adverse events (purple bars) or lack of efficacy (red bars) demonstrate opposing trends with increasing Pregabalin doses: starting at approximately 7% each at 150 mg daily, adverse event-related withdrawals rise steadily to 22% at 600 mg, while withdrawals due to lack of efficacy decline to 3.4% (Wiffen et al. 2013).

Antidepressants

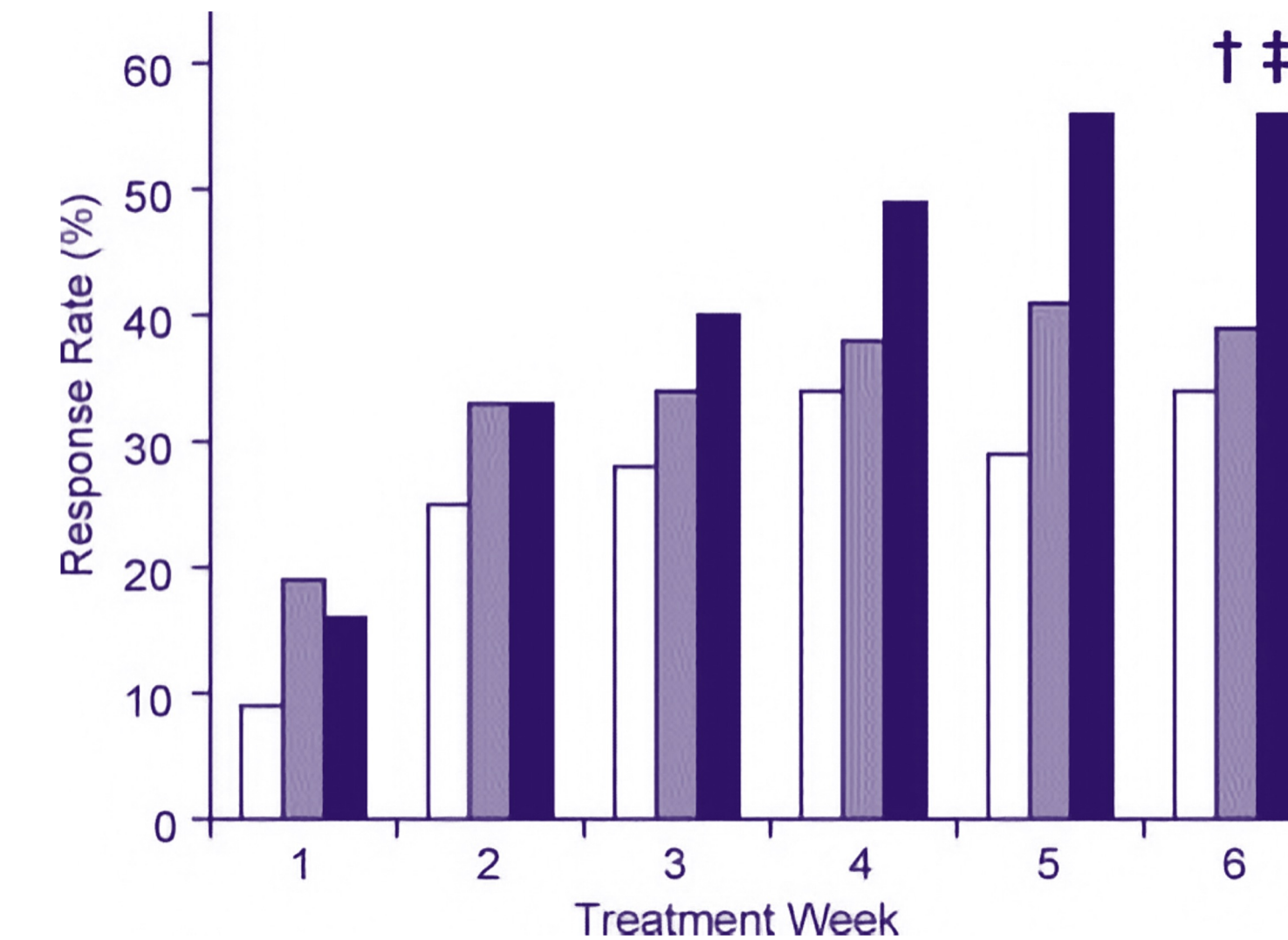


Figure 2. Response rates over six weeks in patients treated with placebo (white bars), venlafaxine ER 75 mg (light purple), and venlafaxine ER 150-225 mg (dark purple), represented as the percentage of patients achieving a significant symptom reduction of 50% or more from baseline. By week 6, 56% of participants receiving venlafaxine ER 150-225 mg reported a $\geq 50\%$ reduction in pain intensity. Statistical analysis at week 6 indicated that venlafaxine ER 150-225 mg was significantly more effective than placebo ($\dagger P < 0.01$) and venlafaxine ER 75 mg ($\ddagger P < 0.05$) (Rowbotham et al. 2004).

Non-Pharmacological

- Psychological Therapies: Cognitive-Behavioral Therapy and Mindfulness-Based Stress Reduction improve coping strategies and decrease perceived pain intensity (Ehde et al. 2014; Cherkin et al. 2016).
- Physical Therapies: Massage therapy sessions alleviate pain and improve mood (Suresh et al. 2008).

Synergy of Treatments

- Evidence from a study conducted at Children's Memorial Hospital involving 57 pediatric patients with an average age of 13.9 years, demonstrated that combining pharmacological treatments with 80 sessions of massage therapy significantly improved pain, tension, discomfort, distress, and mood, with an additional pain reduction of approximately 25% attributed to massage therapy (Suresh et al. 2008).

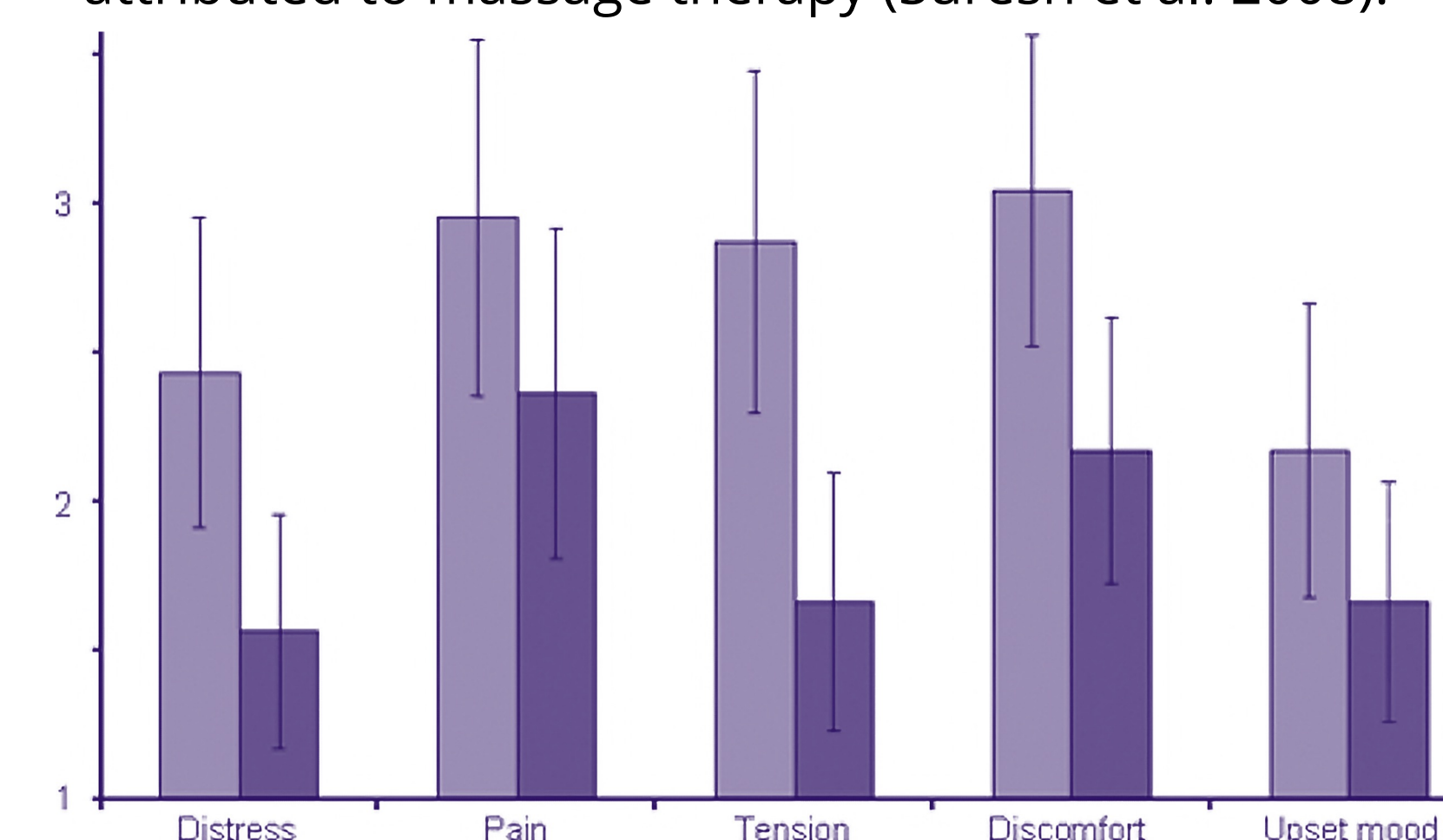


Figure 3. Comparison of pain, tension, discomfort, distress, and mood in 57 pediatric patients before (light purple bars) and after (purple bars) 80 massage therapy sessions, showing significant post-therapy improvements ($P < 1 \times 10^{-8}$) (Suresh et al. 2008).

Conclusion

- Effective management of CP requires a multidisciplinary approach that addresses the complex interplay of physical, emotional, and social factors contributing to pain.
- Integrating pharmacological and non-pharmacological treatments holds promise for achieving better pain control, therefore reducing reliance on medications.
- Ultimately, personalizing care to the individual's needs not only enhances patient outcomes and improves quality of life, but also contributes to reducing the societal burden from CP.

Future Directions

- Conduct larger clinical trials with diverse patient populations.
- Validate combined treatment strategies.
- Assess long-term outcomes.
- Determine the most effective treatment combinations for specific patient subgroups.

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References

