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Effectiveness of Various Intensities of Laser Therapy in Managing Primary Dysmenorrhoea: A Systematic Review

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ABSTRACT

Primary dysmenorrhea, characterised by painful menstrual cramps without an underlying medical condition, significantly impacts the daily lives and well-being of many women worldwide. Traditional pharmacological treatments, while effective, are often associated with side effects, prompting a need for safer, noninvasive alternatives. Laser therapy, particularly Low-level Laser Therapy (LLLT) and High-intensity Laser Therapy (HILT), has emerged as a promising approach. This review evaluates the effectiveness of various laser therapy intensities in reducing pain and improving quality of life in women with primary dysmenorrhea.

A systematic search was conducted using databases such as PubMed, Scopus, Web of Science, and the Cochrane Library, covering studies published between 2000 and 2024. Relevant keywords included "primary dysmenorrhea,""low-level laser therapy," and "high-intensity laser therapy." Out of 42 articles initially identified, 15 studies met the inclusion criteria based on relevance and methodological quality. Articles were excluded if they focussed on secondary dysmenorrhea, lacked clear outcomes, or were not peer-reviewed.

The findings revealed that both LLLT and HILT are effective in reducing pain associated with primary dysmenorrhea. LLLT, particularly at 940 nm, showed progressive improvement with repeated use, while LED photobiomodulation at 630 nm also provided significant pain relief and enhanced quality of life. Additionally, hormonal analysis across studies reported reduced cortisol levels, indicating a physiological shift in pain perception. HILT, with its deeper tissue penetration, was especially effective for severe cases. Importantly, no adverse effects were reported in any of the reviewed studies.

In conclusion, laser therapy, including both LLLT and HILT, offers a safe and effective alternative for managing primary dysmenorrhea. These modalities provide significant pain relief and improve overall quality of life, making them valuable nonpharmacological options. Future research should focus on standardised treatment protocols and exploring the long-term benefits of these therapies to optimise their clinical application.

Keywords: High intensity laser therapy, Low-level laser therapy, Noninvasive therapy, Pain relief.