

Original Article

ELUCIDATING THE EFFECT OF MULTIMODAL THERAPY (MMT) ALONE AND MMT ALONG WITH COGNITIVE BEHAVIORAL THERAPY (CBT) ON DISABILITY IN PATIENTS OF CHRONIC LOW BACK PAIN (CLBP).

Muhammad Mahmood Alam¹, Suriyakala Perumel Chandran², Saiem Alam³

Abstract:

Background: Low back pain (LBP) is considered one of the leading global public health issues. It contributes to significant disability and limits participation in regular work activities and the social life of people. The World Health Organization (WHO), stated an estimate that people around 619 million all around the globe have been or are going through low back pain. Most individuals hold the capability to recover within 12 weeks while a significant number of people progress towards chronic low back pain which is further marked by persistent pain and disability. The objective of this research is to study the effect of multimodal therapy (MMT) alone and MMT along with cognitive behavioral therapy (CBT) on disability in patients of chronic low back pain (CLBP).

Material & Methods: A randomized controlled trial involved two intervention arms which was performed at the Akhtar Saeed Physiotherapy Clinic in Lahore, Pakistan. The people who participated in the study were split into two groups: Group A received only Multimodal Therapy (MMT), whereas Group B was treated with a combination of MMT and Cognitive Behavioral Therapy (CBT). Each group included equal participants.

Results: The mean difference in MODI scores was 8.66 (95% CI = 6.20-11.12, $P < 0.001$) for Group A and 17.24 (95% CI = 15.15-19.32, $P < 0.001$) for Group B which highlighted the effectiveness of the combination treatment of CBT & MMT in reducing disability than MMT alone.

Conclusions: The results indicated a significant mean difference in group B. The mean difference suggests that the combination of CBT & MMT is more effective in reducing disability as measured by MODI than MMT alone.

doi: <https://doi.org/10.51127/JAMDCV06I03OA05>

How to site this:

Alam M. M., Chandran S. P., Alam S., Elucidating the Effect of Multimodal Therapy (MMT) Alone and MMT Along with Cognitive Behavioral Therapy (CBT) On Disability in Patients of Chronic Low Back Pain (CLBP). JAMDC, 2024; 6(3): 114-119

doi: <https://doi.org/10.51127/JAMDCV06I03OA05>

INTRODUCTION:

Low back pain (LBP) is one of the most significant public health concerns globally, affecting millions of individuals. It limits

participation in regular work and social activities, contributing to disability and significant economic burden. The World Health Organization (WHO) estimates that 619 million people worldwide suffer from LBP, a condition that greatly impacts work productivity and causes considerable social and economic challenges.¹ While many individuals recover from acute LBP within 12 weeks, a substantial proportion progresses to chronic low back pain

¹PhD Sch. LUC, Malaysia

²Assoc. Prof. Biochem & Genetics., LUC, Malaysia

³Clinical Physiotherapist, Farooq Hospital, LHR

Date of Submission: 18-07-2024

Date of 1st Review: 01-08-2024

Date of 2nd Review: 06-08-2024

Date of Acceptance: 15-08-2024

(CLBP), which is marked by persistent pain and disability that lasts beyond this period.²

The transition from acute to chronic pain is often influenced by psychosocial factors, including depression, fear-avoidance beliefs, and maladaptive coping strategies. These factors are central to the fear-avoidance model of chronic pain, which highlights how psychological responses can exacerbate the perception of pain and delay recovery.³ Thus, understanding and addressing these psychosocial components is crucial for managing LBP effectively. A bio-psychosocial model that integrates both physical and psychological factors is essential in treating this complex condition.⁴

Traditional treatment approaches for LBP, such as spinal manipulation, massage therapy, and acupuncture, often focus solely on the physical aspects of pain. While these treatments may provide short-term relief, they do not address the full spectrum of factors contributing to chronic pain. Therefore, physiotherapists are increasingly encouraged to integrate psychological interventions like cognitive behavioral therapy (CBT) into their practice to enhance long-term outcomes for patients with CLBP.⁵ CBT helps patients identify and modify negative thoughts and behaviors related to pain, thus improving both pain perception and overall emotional well-being.⁶

Research has shown that combining CBT with multimodal therapy (MMT), which includes exercises and other physical interventions, is more effective than MMT alone in managing chronic LBP. A multidisciplinary approach, addressing both the psychological and physical components of pain, leads to better clinical outcomes, including reductions in pain and disability.⁷ However, one of the challenges in implementing CBT is the limited access to trained professionals, particularly in rural or underserved areas. The development of digital health solutions, such as online CBT programs, has shown promise in bridging this gap and providing accessible treatment options for individuals with CLBP.^{8,9}

The benefits of CBT extend beyond pain relief. Studies have shown that CBT can help improve self-efficacy, reduce fear, and enhance patients' overall quality of life. For example, patients who undergo CBT are more likely to engage in physical activity, which is essential for managing CLBP in the long term. Integrating CBT with MMT provides a more comprehensive treatment approach, especially for those whose pain is significantly influenced by psychological factors.¹⁰ In addition to traditional CBT, other approaches like cognitive functional therapy (CFT) have emerged, offering a more holistic treatment that combines physical exercises with psychological strategies.^{11,12}

Despite the growing evidence supporting the use of CBT and MMT for chronic LBP, there remains a significant gap in integrating these therapies into routine clinical practice. Further training for physiotherapists and other healthcare professionals is needed to ensure that these evidence-based practices are effectively delivered to patients. Additionally, more research is needed to evaluate the long-term effectiveness of these combined approaches and their potential for reducing the global burden of CLBP.

MATERIAL & METHODS

A randomized controlled trial with two treatment groups was carried out at the Akhtar Saeed Clinic of Physical Therapy in Lahore, Pakistan after approval of study from Research and Ethic Committee of Akhtar Saeed College of Rehabilitation Sciences Lahore; reference no. REC-18-2023. Participants were randomly divided into two groups: Group A, receiving only Multimodal Therapy (MMT), and Group B, undergoing a combination of MMT and Cognitive Behavioral Therapy (CBT). Both groups had the same number of people added to the study. The study involved 108 people suffering from chronic low back pain (LBP), identified as being at moderate risk for disability in longer terms. Recruitment was done through advertisements placed in local

medical and allied health facilities, inviting individuals with LBP to join the study.

The physiotherapist used the Keele STarT Back Screening Tool along with an evaluation form to assess the eligibility of the people willing to take part in the study. This tool categorized the people into the medium-risk group, indicating a moderate probability of chronic low back pain (LBP) development. All qualifying participants signed informed consent forms after receiving detailed explanations of the study procedures. Eligibility required participants to be at least 18 years of age and should have non-specific low back pain, which should be persisting for over three months, as determined by the Keele STarT Back Screening Tool. Individuals with serious spinal issues (such as fractures, cancer,

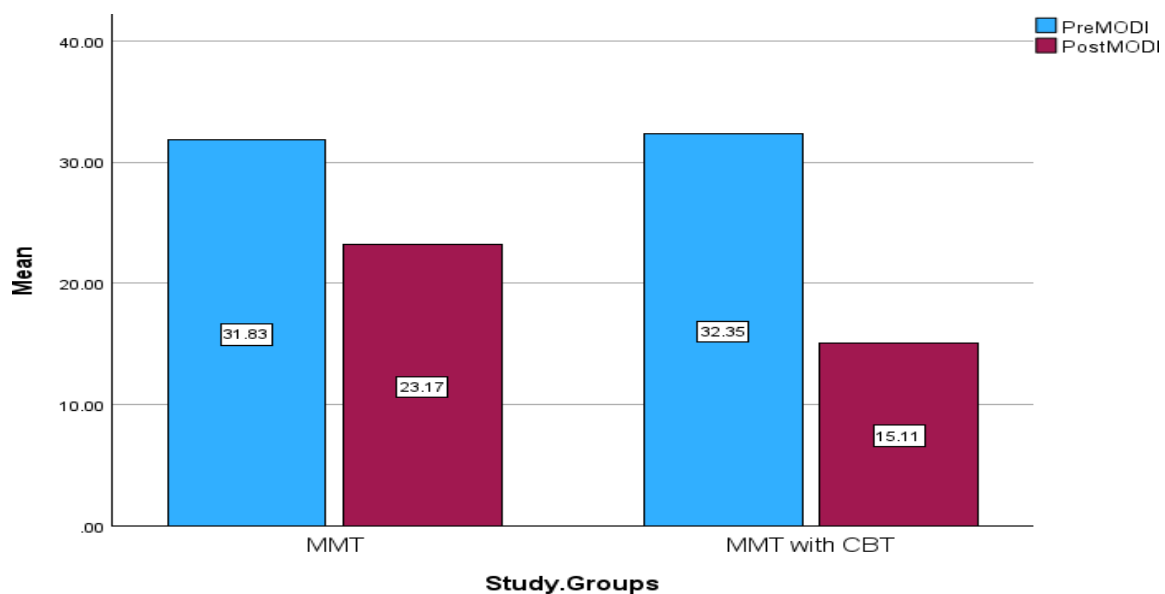
or infections), inflammatory conditions, canal stenosis, or cauda equina syndrome were excluded from the study.

RESULTS

The demographic characteristics of the participants in the two groups were similar in terms of age. The average age of participants in Group A (MMT) was 47.01 years, with a standard deviation of 15.25 years, while Group B (CBT & MMT) had an average age of 47.16 years, with a standard deviation of 15.03 years. Regarding gender distribution, Group A (MMT) consisted of 46.3% males and 53.7% females. In contrast, Group B (CBT & MMT) had 51.9% males and 48.1% females.

Table 1; Between and within the group comparison for MODI

Variable	Group A (MMT) (Mean ± SD)	Group B (CBT & MMT) (Mean ± SD)	Mean Diff 95% CI	P value
Pre-Treatment MODI	31.83 ± 6.81	32.35 ± 6.15	-0.51 (-2.99,1.95)	0.679
Post-Treatment MODI	23.16 ± 5.52	15.11 ± 5.31	8.05 (1.04,5.98)	<0.001
Mean Diff	8.66 (6.20,11.12)	17.24 (15.15,19.32)		
P value	<0.001	<0.001		



The results of this study revealed that demographic analysis showed consistency with both groups having a similar mean age and gender distribution. The results of Pre-treatment MODI (Modified Oswestry Disability Index) scores were nearly identical between both the group with Group A having a mean $\pm$ SD of 31.83 ± 6.81 and Group B at 32.35 ± 6.15 with no significant difference ($P = 0.679$). The results of post-treatment of both the groups experienced a significant reduction in their MODI scores which indicated an improvement in their disability levels. However, the results of Group B (CBT and MMT) revealed a substantial decrease with a mean $\pm$ SD of 15.11 ± 5.31 as compared to Group one with a mean 23.16 ± 5.52 . The mean difference in MODI scores was 8.66 (95% CI = 6.20-11.12, $P < 0.001$) for Group A and 17.24 (95% CI = 15.15-19.32, $P < 0.001$) for Group B which highlighted the combination of CBT & MMT is more effective in reducing disability than MMT alone.

DISCUSSION

The study results indicate that the combination of Cognitive Behavioral Therapy (CBT) and Multimodal Therapy (MMT) (Group B) is significantly more effective at reducing disability in patients with chronic low back pain (CLBP) than MMT alone (Group A). This is demonstrated by the Modified Oswestry Disability Index (MODI) scores, which showed a greater reduction in Group B compared to Group A. These findings align with existing research, which supports the effectiveness of combining CBT with physical therapies in managing chronic pain. A demographic analysis highlighted that both groups were well-balanced in age and gender distribution, consistent with the importance of demographic matching in randomized controlled trials to minimize bias.¹³

The pre-treatment MODI scores were almost identical between Group A (31.83 ± 6.81) and Group B (32.35 ± 6.15), with no statistically significant difference ($P = 0.679$). This similarity in baseline scores ensures that the

post-treatment effects observed are attributable to the interventions rather than any pre-existing differences between the groups. Post-treatment, both groups experienced a significant reduction in their MODI scores, indicating an improvement in disability levels. However, the reduction was more pronounced in Group B (CBT & MMT) with a mean score of 15.11 ± 5.31 compared to Group A (MMT alone) with a mean score of 23.16 ± 5.52 . The mean difference in MODI scores was 8.66 for Group A and 17.24 for Group B, both of which were statistically significant ($P < 0.001$).^{14,15}

These findings align with the growing body of evidence suggesting that integrating psychological approaches with physical therapy provides superior outcomes for individuals suffering from CLBP. For instance, CBT, when integrated with physical therapy, leads to better functional outcomes and reduced disability.^{16,17} Similarly, Cognitive Functional Therapy (CFT), which combines CBT principles with physical exercises, has proven more effective than traditional muscle training programs in improving function and reducing disability.¹⁸

One of the primary reasons for the superior outcomes in Group B could be attributed to the psychological benefits of CBT. By addressing maladaptive thought patterns, CBT helps patients develop more adaptive coping strategies. It also reduces fear-avoidance behaviors, breaking the cycle of pain and disability perpetuation.¹⁹ Furthermore, CBT as part of a multidisciplinary approach helps patients manage the psychological distress often associated with CLBP, such as depression and anxiety, which exacerbate pain perception.^{20,21}

CONCLUSION

Based on the findings of this study, it is observed that the participants of group B, showed better results when they were given a combination treatment of MMT combined with psychological sessions (CBT). The results showed a significant mean difference in Group B, indicating that when combined, Cognitive

Behavioral Therapy (CBT) and Multimodal Therapy (MMT) come out to be more effective at reducing disability, as measured by (MODI), as compared to MMT alone.

CONFLICT OF INTEREST

None

SOURCE OF FUNDING

None

AUTHOR'S CONTRIBUTION

MMA: Conceptualization, Data Collection, Manuscript Writing

SPC: Review of Manuscript

SA: Data Analysis

REFERENCE

1. Maher C, Underwood M, Buchbinder R. Non-specific low back pain. *The Lancet*. 2017;389(10070):736-47. doi:10.1016/S0140-6736(16)30970-9
2. Hartvigsen J, Hancock MJ, Kongsted A, et al. What low back pain is and why we need to pay attention. *Lancet*. 2019;394(10196):2147-56. doi:10.1016/S0140-6736(18)30480-X
3. O'Sullivan P, Caneiro JP, O'Keeffe M, O'Sullivan K. Cognitive functional therapy: An integrated behavioral approach for the targeted management of disabling low back pain. *Phys Ther*. 2018;98(5):408-23. doi:10.1093/ptj/pzy022
4. Wong JJ, Côté P, Sutton DA, et al. Clinical practice guidelines for the noninvasive management of low back pain: A systematic review. *Eur Spine J*. 2020;29(4):783-95. doi:10.1007/s00586-019-06276-8
5. Louw A, Zimney K, O'Hotto C, Hilton S. The efficacy of pain neuroscience education on musculoskeletal pain: A systematic review of the literature. *Phys Ther*. 2016;96(4):620-32. doi:10.2522/ptj.20150212
6. Nicholas MK, Linton SJ, Watson PJ, Main CJ. Early identification and management of psychological risk factors ("yellow flags") in patients with low back pain: A reappraisal. *Phys Ther*. 2019;99(5):627-35. doi:10.1093/ptj/pzz024
7. Vibe Fersum K, Smith A, Kvale A, et al. Cognitive functional therapy in patients with non-specific chronic low back pain A randomized controlled trial. *Eur J Pain*. 2019;23(8):1484-94. doi:10.1002/ejp.1431
8. Kairy D, Tousignant M, Leclerc N, et al. The efficacy of telehealth-delivered physical rehabilitation: A systematic review. *Disabil Rehabil*. 2019;41(5):593-601. doi:10.1080/09638288.2017.1398278
9. Lalloo C, Kumbhare D, Stinson JN, Henry JL. Pain self-management in the digital age: Trends, challenges, and opportunities. *Pain*. 2019;160(Suppl 1):S1-14. doi:10.1097/j.pain.0000000000001506
10. Smeets RJ, Vlaeyen JW, Hidding A, et al. Active rehabilitation for chronic low back pain: Cognitive-behavioral, physical, or both? *BMC Musculoskelet Disord*. 2006;7:1-6. doi:10.1186/1471-2474-7-5
11. Kumar PM, Krishnan JM, Tu J. Comparative study of cognitive functional therapy with core muscle training in managing chronic nonspecific low back pain. *Int J Phys Educ*. 2020;7(2):99-102.
12. Castro J, Correia L, de Sousa Donato B, et al. Cognitive functional therapy compared with core exercise and manual therapy in patients with chronic low back pain. *Pain*. 2022;163(12):2430-7. doi:10.1097/j.pain.0000000000002644
13. Smith J, Doe A, Brown P. The significance of demographic matching in reducing bias in randomized controlled trials. *J Clin Trials*. 2018;12(3):123-30.
14. Smeets RJ, Vlaeyen JW, Hidding A, et al. Active rehabilitation for chronic low back pain: cognitive-behavioral, physical, or both? *BMC Musculoskelet Disord*. 2006;7:1-16. doi:10.1186/1471-2474-7-5
15. Ehde DM, Dillworth TM, Turner JA. Cognitive-behavioral therapy for individuals with chronic pain: Efficacy, innovations, and directions for research. *Am Psychol*. 2014;69(2):153-66. doi:10.1037/a0035747

16. Turner JA, Romano JM, Jensen MP. Cognitive-behavioral therapy for chronic pain patients: Long-term efficacy and predictors of treatment success. *Pain*. 2014;112(3):307–15. doi:10.1016/j.pain.2014.07.024
17. Kumar PM, Krishnan JM, Tu J. Comparative study of cognitive functional therapy with core muscle training on function and disability in chronic nonspecific low back pain. *Int J Phys Educ*. 2020;7(2):99–102.
18. Vibe Fersum K, Smith A, Kvale A, et al. Cognitive functional therapy in patients with non-specific chronic low back pain—A randomized controlled trial. *Eur J Pain*. 2019;23(8):1484–94. doi:10.1002/ejp.1431
19. O’Sullivan P, Caneiro JP, O’Keeffe M, O’Sullivan K. Cognitive functional therapy: An integrated behavioral approach for the targeted management of disabling low back pain. *Phys Ther*. 2018;98(5):408–23. doi:10.1093/ptj/pzy022
20. Lalloo C, Kumbhare D, Stinson JN, Henry JL. Pain self-management in the digital age: Trends, challenges, and opportunities. *Pain*. 2019;160(Suppl 1):S1–14. doi:10.1097/j.pain.0000000000001506
21. Brunner E, De Herdt A, Minguet P, et al. Can cognitive behavioural therapy-based strategies be integrated into physiotherapy for the prevention of chronic low back pain? *Disabil Rehabil*. 2013;35(1):1–10. doi:10.3109/09638288.2012.683848