

Effectiveness of Task Oriented Training Combined with Cognitive Behavioral Therapy on Occupational Performance Among Patients with Low Back Pain

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Abstract

Aim: The study objective was to ascertain the effectiveness of task-oriented training combined with cognitive behavioral therapy on occupational performance among individuals with low back pain.

Materials and Methods: The study used a randomized control trial research methodology to examine the effect of task-oriented training combined with cognitive behavioral therapy on occupational performance among individuals with low back pain. The study was carried out at Chettinad Hospital and Research Institute, Chennai. Ethics approval for the study was obtained from the institutional human ethical committee (Protocol No: IHEC-I/3760/25) and clinical trial registry-India registration (CTRI/2025/06/088726). Non-specific chronic low back pain subjects (n=60) were enrolled in the study using a convenient sampling method. They were randomly assigned to experimental and control groups using sealed opaque envelope randomization. COPM was utilized to measure occupational performance among subjects prior to and after intervention. The experimental group was subjected to task-oriented training coupled with cognitive behavioral therapy for 45 minutes each session for six days each week over a period of four weeks, equating to 24 sessions. In contrast, the control group was subjected to routine care. The intervention comprised of functional task practice, graded activities, cognitive restructuring, positive self-talk, relaxation breathing, activity pacing, and thought monitoring techniques. Pre-test and post-test data were statistically analyzed to determine the effectiveness of the intervention on occupational performance.

Results: The findings from the study showed that there was a significant improvement in occupational performance as a result of applying the combination of task oriented training and cognitive behavior therapy to patients suffering from low back pain. There was considerable increase in the COPM scores among the experimental subjects. On the performance score, the average COPM score increased from 3.94 to 6.74 with the difference being 2.8 ± 0.29 . On the other hand, the average COPM satisfaction

scores increased from 4.08 to 6.95 with the change in mean being 2.87 ± 0.31 . However, among the control group, there was an insignificant increase in the COPM scores. On the performance scores, the average score rose from 3.93 to 4.31 and on the satisfaction scores the average increased from 4.05 to 4.43. There were highly significant differences between the two groups as found out through paired and independent t-tests ($p < 0.001$). The findings indicate that the combined intervention effectively improved occupational performance, participation in daily activities, and occupational satisfaction among patients with chronic low back pain.

Conclusion: The findings of the study revealed that task-oriented training along with cognitive behavioral therapy is a useful method of rehabilitation for enhancing occupational functioning and satisfaction in patients suffering from chronic low back pain. The two methods, when used together, were found to effectively tackle both the physical and psychological aspects that hinder occupational functioning such as restricted functional mobility, fear-avoidance behaviors, and negative thinking styles. The participants who underwent treatment showed significant improvement in their engagement in productive activities and functional independence than those in the control group. The findings support the effectiveness of a biopsychosocial and occupation-centered rehabilitation approach in occupational therapy practice for individuals with chronic low back pain.

Keywords: Low Back Pain, Task-Oriented Training, Cognitive Behavioral Therapy, Occupational Performance, Occupational Therapy, COPM

1. Introduction

Low back pain (LBP) is known to be one of the most common musculoskeletal diseases that involve the condition associated with pain that manifests itself in the lower back region. LBP may be described as pain occurring from the 12th rib to gluteal folds. The illness may be categorized according to the duration of pain that can vary and include such varieties as acute, sub-acute, and chronic conditions with the latter being the one that has an effect on patient's functioning most significantly. Another way of categorizing LBP involves determining whether the cause of the condition can be established or not; accordingly, we should talk about specific and non-specific low back pain when the latter one affects about 85-90% of patients without a diagnosed cause. The problem is extremely significant for public health care since LBP can be viewed as the leading cause of disability and affects millions of people. Furthermore, the disease is expected to become more widespread due to the growing amount of elderly population and poor living standards. [1,2,3]

In addition to its association with pain, chronic low back pain adversely impacts the mobility and other facets of life of an individual. These patients face difficulties in carrying out simple tasks such as sitting, standing, walking, bending, and lifting objects, thus leading to their inability to carry out activities of daily living and instrumental activities of daily living. Functional independence in engaging in activities that enhance the quality of life is lost. Occupational functioning is also impaired as patients are not capable of being productive in their responsibilities; thus, they are less productive than absent. Apart from this, chronic low back pain bears considerable economic consequences owing to direct and indirect cost considerations; however, indirect costs outweigh direct costs significantly. [4,5,6]

In connection with the contribution of several psychological components, which include fear of movement, pain catastrophizing, anxiety, and depression, it is necessary to emphasize that, in the context of the biopsychosocial model, these components play an essential role due to the nature of the pain

perception being associated with multiple psychological and biological aspects rather than purely physiological. Consequently, it is crucial to take into account the mentioned factors when developing the appropriate therapy for chronic low back pain. Physical intervention includes the application of rehabilitation programs that focus on the restoration of the patients' abilities and enhancement of their neuroplasticity through the performance of certain exercises. Cognitive and behavioral strategies are used to assist the patients to develop a different way of perceiving their problems, so that they would feel like participating in daily activities without any reduction in pain levels. The literature review clearly indicates the possibility of combining these approaches into one program; however, the influence of such intervention on the patients' ability to perform tasks and participate in social life requires further investigation. [7,8,9]

2. Related Literature

The existing literature highlights that low back pain (LBP) should be understood and managed as a multifactorial condition requiring a comprehensive approach. In their clinical guideline, Airaksinen et al. (2006) emphasized the importance of multidisciplinary management, advocating for the integration of physical and psychological interventions such as therapeutic exercise and cognitive behavioral therapy (CBT). Similarly, Allegri et al. (2016), in their review, described LBP as a condition influenced by biological, psychological, and social factors, thereby supporting the need for combined treatment strategies rather than isolated therapeutic approaches. [10,11,12,13]

Further evidence underscores the significant relationship between psychological factors and chronic pain. Bair et al. (2003), through an observational study, reported a strong association between depression and chronic pain, suggesting that psychological comorbidities play a critical role in the persistence and severity of LBP. This finding reinforces the necessity of incorporating psychological interventions, particularly CBT, into routine clinical management to address both the physical and emotional dimensions of pain. [14,15,16]

In addition, epidemiological research points to the widespread burden of LBP at the population level. Bansal et al. (2020) highlighted the high prevalence and impact of LBP, emphasizing the need for effective and function-oriented rehabilitation strategies. Collectively, these studies support the adoption of a biopsychosocial model in the management of LBP, which integrates physical rehabilitation with psychological care to improve functional outcomes and overall quality of life. [17,18,19,20]

3. Aim & Objective of study

3.1 Aim of the study:

To study the effectiveness of Task Oriented training combined with cognitive behavioural therapy on occupational Performance among patients with Low Back Pain.

3.2 Objectives

- To determine association of demographical variables
- To determine Pre-Test value of Control Group using COPM
- -To determine Post-Test value of Control Group using COPM
- -To determine Pre-Test value of Experimental Group using COPM
- -To determine Post-Test value of Experimental Group using COPM
- -To compare changes in occupational performance between Control and experimental group using COPM

- To assess the baseline occupational performance levels in patients with chronic low back pain.

4. Methodology

This research study is an RCT to measure the efficacy of Task-Oriented Training in combination with CBT in individuals with chronic low back pain. Approval and registration from ethical boards and CTRI respectively have been secured prior to the experiment.

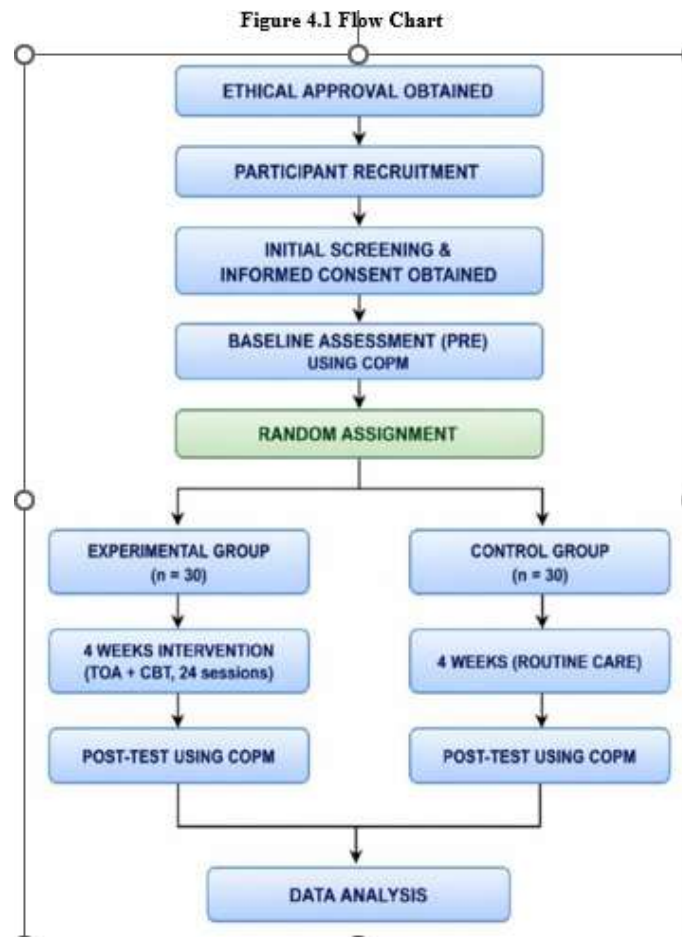
A sample size of 60 subjects aged between 18-65 years suffering from chronic low back pain was recruited from the Chettinad Hospital and Research Institute, Chennai. The subjects were randomly allocated to Experimental and Control Groups using opaque sealed envelopes in a single-blind procedure.

The baseline and post-test measures were taken using Canadian Occupational Performance Measure (COPM).

The experimental group underwent task-oriented training that combined CBT techniques for 4 weeks, where the training consisted of 24 sessions each lasting 45 minutes. This training program involved warm-ups, task training using CBT strategies such as positive self-talk, cognitive restructuring, breathing relaxation techniques, and activity pacing followed by cool down sessions.

Meanwhile, the control group proceeded with the usual management without any extra treatments. After 4 weeks, post-test was done, and data gathered were statistically analyzed in order to find out whether the intervention program was effective on occupational performance among patients with chronic low back pain.

4.1. Flow chart of study:



5. Result and Analysis

This RCT to measure the efficacy of Task-Oriented Training in combination with CBT in individuals with chronic low back pain.

Demographical Variables (Age, Gender)

Table 5.1 Distribution of Demographical Variables Among Experimental and Control Groups

Variable	Experimental Group (n=30)	Control Group (n=30)	p-value
Age (years)	38.1 ± 7.20	38.1 ± 7.20	>0.05
Female (n, %)	22 (73.3%)	22 (73.3%)	>0.05
Male (n, %)	8 (26.7%)	8 (26.7%)	>0.05

There was no statistically significant difference between the experimental and control groups in terms of age and gender distribution ($p > 0.05$), indicating that both groups were comparable at baseline.

Within-Group Analysis

Table 5.2. Within-Group Comparison of COPM Scores

Group	Measure	Pre Mean	Post Mean	Mean Difference ± SD	t-value	p-value
Experimental	Performance	3.94	6.74	2.80 ± 0.29	48.7	<0.001
	Satisfaction	4.08	6.95	2.87 ± 0.31	52.9	<0.001
Control	Performance	3.93	4.31	0.38 ± 0.14	13.2	<0.001
	Satisfaction	4.05	4.43	0.38 ± 0.15	12.8	<0.001

The experimental group showed a large and statistically significant improvement in both COPM performance and satisfaction scores ($p < 0.001$), whereas the control group demonstrated only minimal improvement despite statistical significance.

Between-Group Comparison

Table 5.3. Post-Test Comparison Between Groups

Variable	Control Group Mean	Experimental Group Mean	Mean Difference	t-value	p-value
COPM Performance (Post)	4.31	6.74	2.43	31.6	<0.001
COPM Satisfaction (Post)	4.43	6.95	2.52	33.2	<0.001

Post-test comparison revealed that the experimental group had significantly higher COPM performance and satisfaction scores than the control group ($p < 0.001$), indicating the effectiveness of the intervention.

Effect Size Analysis of COPM Performance and Satisfaction Scores

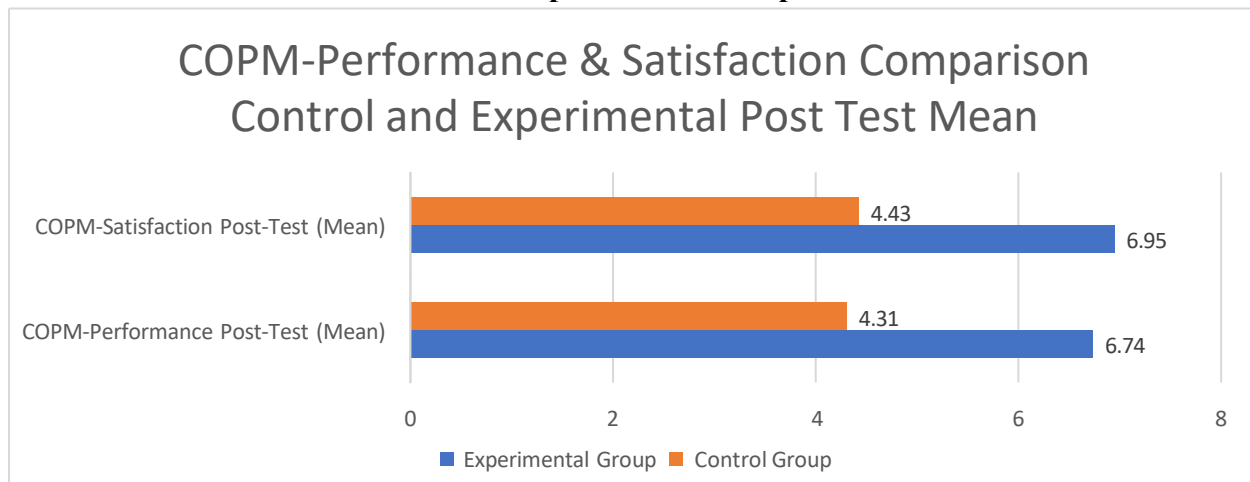
Table 5.4 Effect Size (Cohen's d) for Pre-Test and Post-Test Comparison in Experimental and Control Groups

Measure	Cohen's d	Magnitude
Performance (Exp Pre-Post)	9.7	Very large
Satisfaction (Exp Pre-Post)	9.3	Very large

Performance (Control Pre–Post)	1.1	Moderate
Satisfaction (Control Pre–Post)	1	Moderate

The experimental group demonstrated a very large effect size, indicating a strong impact of the intervention on both occupational performance and satisfaction. In contrast, the control group showed only moderate effect sizes, suggesting comparatively smaller improvements.

Figure 5.7 Comparison of Post-Test COPM Performance and Satisfaction Scores Between Control and Experimental Groups



The experimental group showed higher post-test COPM performance and satisfaction scores than the control group, indicating that task-oriented training combined with CBT is more effective in improving occupational performance and satisfaction in individuals with chronic low back pain.

6. Discussion & Conclusion

This study demonstrated that task-oriented training combined with cognitive behavioral therapy (CBT) significantly improved occupational performance and satisfaction in individuals with chronic low back pain. The experimental group showed clinically meaningful improvements in COPM performance (3.94 to 6.74) and satisfaction (4.08 to 6.95), with mean differences greater than 2 points ($p < 0.001$). In contrast, the control group showed only minimal improvements (mean difference = 0.38). Between-group analysis also revealed significantly higher post-test scores in the experimental group ($p < 0.001$). These findings suggest that the combined intervention effectively addresses both physical and psychological factors, leading to enhanced functional outcomes. Despite limitations such as small sample size and short duration, the results support the use of a holistic, occupation-centered approach. Overall, task-oriented training with CBT is an effective strategy for improving occupational performance and participation in daily activities.

7. Limitations and Future Recommendations

The small sample size ($N = 60$) and single-center setting may limit generalizability. The short intervention period (4 weeks) and absence of follow-up restrict conclusions about long-term effectiveness. Additionally, the use of COPM, a subjective measure, may be influenced by participants' perceptions, and factors such as stress, ergonomics, sleep, and adherence to home programs were not

assessed. Future research should include larger, multicenter samples with longer intervention durations and follow-up assessments. Comparative studies with other treatment approaches, along with the inclusion of psychological variables and technology-based rehabilitation methods, are recommended to enhance clinical applicability and understanding of long-term outcomes.

Acknowledgement

I sincerely thank Almighty God, my family, friends, participants, and everyone who supported and contributed to the successful completion of this dissertation.

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