



EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY FOR MANAGING DEPRESSION AND ACTIVITY OF DAILY LIVING IN STROKE PATIENTS

Medical Science

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ABSTRACT

Stroke remains a leading cause of long-term disability worldwide, often resulting in significant physical and psychological challenges. Post-stroke depression (PSD), affecting nearly one-third of stroke survivors, is a prevalent neuropsychiatric complication that impairs recovery, limits participation in rehabilitation, and reduces overall quality of life. Cognitive Behavioural Therapy (CBT) has shown promise as an effective treatment modality for managing depression in this population. However, its impact on enhancing Activities of Daily Living (ADL) is less clearly understood. This quasi-experimental pre- and post-test study aimed to evaluate the effectiveness of CBT in managing depression and improving ADL among stroke patients. A total of 60 participants aged 50–60 years, meeting specific inclusion and exclusion criteria, were recruited over a 12-month period. Depression levels were assessed using the Beck Depression Inventory (BDI), and functional ability was measured using the Barthel Index (BI). Results indicated a significant reduction in BDI scores post-intervention, reflecting decreased depressive symptoms, along with a marked improvement in BI scores, signifying enhanced functional independence. These findings support the efficacy of CBT not only in alleviating post-stroke depression but also in improving the capacity for daily functioning, highlighting its potential role as a valuable therapeutic strategy in stroke rehabilitation.

KEYWORDS

Stroke, Post-Stroke Depression, Cognitive Behavioural Therapy, Activities of Daily Living, Beck Depression Inventory, Barthel Index, Stroke Rehabilitation.

INTRODUCTION

Stroke remains a leading cause of long-term disability globally, often resulting in profound physical and psychological consequences. Among stroke survivors, depression is a common neuropsychiatric complication that significantly hampers recovery and quality of life. Cognitive Behavioural Therapy (CBT) has emerged as a promising intervention for managing post-stroke depression (PSD), aiding in emotional regulation and cognitive rehabilitation. However, its specific effectiveness in improving Activities of Daily Living (ADL) remains insufficiently explored.

PSD affects approximately one-third of stroke survivors, with depressive symptoms contributing to greater functional impairment and reduced participation in rehabilitation efforts. ADLs—comprising essential self-care tasks such as bathing, dressing, eating, and mobility—are vital for independent living and overall well-being. Addressing depressive symptoms is therefore critical not only for psychological recovery but also for optimizing functional outcomes.

CBT is a structured, goal-oriented form of psychotherapy aimed at identifying and altering maladaptive thought patterns and behaviors to promote emotional resilience. In stroke rehabilitation settings, CBT has shown potential in reducing depressive symptoms and boosting motivation for recovery. Key components of CBT—such as cognitive restructuring, behavioral activation, and problem-solving—can encourage patients to re-engage with daily tasks and routines.

Despite its demonstrated efficacy in treating depression, the direct impact of CBT on enhancing ADL performance among stroke patients remains under-investigated. Preliminary findings suggest that when CBT is integrated with physical rehabilitation, it may yield improved functional outcomes by fostering greater engagement with therapy and instilling a proactive recovery mindset. However, comprehensive evidence from large-scale randomized controlled trials (RCTs) assessing CBT's dual impact on psychological and functional recovery is currently lacking.

Moreover, the neurobiological underpinnings of PSD involve complex interactions between neurochemical imbalances, cognitive dysfunction, and physical limitations. Stroke-related damage to brain regions such as the prefrontal cortex and limbic system contributes to both depressive symptoms and impaired executive functioning, which are closely linked to ADL capabilities. By addressing maladaptive cognitive processes, CBT may support neuroplasticity and enhance adaptive coping strategies, thereby indirectly promoting improved engagement in daily functional activities.

Rationale of the Study

Stroke is a leading cause of long-term disability worldwide and often

results in both physical impairments and psychological complications, particularly depression. Post-stroke depression (PSD) affects approximately one-third of stroke survivors and significantly hinders recovery, rehabilitation outcomes, and quality of life. Depression not only impairs emotional well-being but also negatively impacts motivation, self-efficacy, and the ability to perform activities of daily living (ADLs), which are critical for independent functioning. Cognitive Behavioural Therapy (CBT) is a widely recognized, evidence-based psychological intervention that focuses on identifying and modifying negative thought patterns and behaviors. It has been shown to be effective in treating depression in various populations. However, its application in stroke rehabilitation, particularly in addressing both depression and functional independence in ADLs, remains underexplored. This study aims to evaluate the effectiveness of CBT in reducing depressive symptoms and improving ADL performance among stroke patients. By integrating CBT into stroke rehabilitation, the study seeks to contribute valuable insights into holistic recovery approaches that address both psychological and functional domains, ultimately enhancing the quality of post-stroke care.

Aim and Objectives

Aim

The aim is to study the effectiveness of cognitive behavioral therapy for managing depression and improving activities of daily living in stroke patients.

Objectives

- To determine demographic data with outcome measures.
- To determine pre-test & post-test score of depression through Beck

Hypothesis:

Null Hypothesis (H₀): Cognitive Behavioral Therapy has no significant effect in managing depression and improving activities of daily living in stroke patient.

Alternative Hypothesis (H₁): Cognitive Behavioral Therapy has significant effect in managing depression and improving activities of daily living in stroke patient.

Research Methodology

Study Type: This type of study is a pre-and post-test treatment/ Intervention based study.

Study Design: The study employs a quasi-experimental pre-post design to evaluate the effects of the intervention.

Sample Size: A total of 60 participants were included in the study, meeting the inclusion and exclusion criteria.

Study Duration: 12 months

Sampling Criteria**Inclusion Criteria**

- Age between 50-60 year
- MMSE > 11 points
- Subject agreement to participate in a trial

Exclusion Criteria

- Uncooperative patient
- MMSE < 11 points

Sampling Technique

A convenient sampling technique was used to recruit participants,

Table 1.0 Paired Sample Test:

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	BDI Pre-Test – BDI Post Test	4.000	1.690	.239	3.520	4.480	16.733	49	<.001	<.001
Pair 2	BI Pre-Test BI Post Test	-10.500	5.076	.718	-11.943	-9.057	-14.627	49	<.001	<.001

The paired samples test indicates significant differences in both depression and activities of daily living (ADL) scores between the pre-test and post-test assessments. The analysis of depression levels, measured using the Beck Depression Inventory (BDI), shows a mean difference of 4.000, with a standard deviation of 1.690. The confidence interval (CI) ranges from 3.520 to 4.480, and the t-value is 16.733 with 49 degrees of freedom (df = 49). The p-value (<.001) confirms that this difference is statistically significant, suggesting that depression levels significantly decreased following the intervention.

Table 2.0 Paired Samples Effect Sizes

Paired Samples Effect Sizes			Standard -izera	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	BDI Pre-Test	Cohen's d	1.690	2.366	1.820	2.906
	BDI Post Test	Hedges' correction	1.717	2.330	1.792	2.861
Pair 2	BI Pre-Test	Cohen's d	5.076	-2.069	-2.559	-1.571
	BI Post Test	Hedges' correction	5.155	-2.037	-2.519	-1.547

a. The denominator used in estimating the effect sizes.

Cohen's d uses the sample standard deviation of the mean difference.

Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Beck Depression Inventory (BDI) and the Barthel Index (BI) reveals significant changes in depression levels and activities of daily living (ADL) among participants. For depression, the comparison between pre-test and post-test scores using the BDI shows a substantial reduction in depressive symptoms. The effect size, measured through Cohen's d, is 2.366, with a confidence interval ranging from 1.820 to 2.906. Hedges' correction, which accounts for sample size bias, provides a slightly adjusted estimate of 2.330 (CI: 1.792 to 2.861).

RESULTS AND DISCUSSION

A comparison of pre- and post-intervention scores demonstrates both statistically and clinically significant improvements in depression and ADL. The decrease in BDI scores signifies a reduction in depressive symptoms, while the increase in BI scores indicates greater functional independence. These results underscore the intervention's efficacy in alleviating depression and improving daily functioning among participants.

Paired samples correlations reveal a strong, statistically significant relationship between pre- and post-intervention scores for both depression and ADL. For depression, the correlation between pre- and post-BDI scores is 0.935 ($p < .001$), indicating a robust positive relationship. For ADL, the correlation between pre- and post-BI scores is 0.921 ($p < .001$), similarly reflecting a strong positive association. These findings suggest that pre- and post-intervention scores are closely related, though additional analyses, such as paired t-tests, are required to confirm the direction and significance of the changes. These results suggest a degree of cognitive impairment within the studied population, particularly when considering the MMSE cutoff score for normal cognitive function.

focusing on accessibility and feasibility.

Variables Dependent Variable: Depression, Activities of daily living, **Independent Variables:** Cognitive Behavioural Therapy

Screening Tool: Mini-Mental State Examination (MMSE) The Mini-Mental State Examination (MMSE) is a brief, standardized tool used to assess cognitive impairment in individuals with various conditions such as dementia, stroke, Parkinson's disease, and other neurological disorders.

Data Analysis:

In conclusion, stroke incidence is influenced by a complex interplay of genetic, environmental, and lifestyle factors. While significant progress has been made in reducing stroke incidence in high-income countries, the global burden remains high, particularly in low- and middle-income regions.

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