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Cognitive Behavioural Therapy for Stroke Patients: Effects on Depression and Daily Living Activities

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ABSTRACT :

Stroke remains a major cause of long-term disability and contributes significantly to the global disease burden. Beyond physical impairments, post-stroke depression (PSD) affects nearly one-third of survivors, negatively impacting functional recovery, quality of life, and rehabilitation outcomes. Cognitive Behavioural Therapy (CBT), a structured psychotherapeutic intervention, has shown promise in addressing depressive symptoms among stroke patients by reshaping maladaptive thoughts and behaviors. This quasi-experimental study aimed to assess cognitive function using the Mini-Mental State Examination (MMSE) and evaluate the effectiveness of CBT on depression levels using the Beck Depression Inventory in a sample of 60 stroke patients aged 50–60 years. Participants met defined inclusion criteria and were evaluated over a 12-month period. The mean MMSE score was 19.08 with a standard error of 0.33, indicating consistent cognitive performance across the sample. Pre- and post-test comparisons highlighted CBT's potential in reducing depression and supporting post-stroke recovery.

Keywords: Stroke, Post-Stroke Depression, Cognitive Behavioural Therapy (CBT), Mini-Mental State Examination (MMSE), Beck Depression Inventory, Rehabilitation, Psychological Intervention

Introduction

Stroke is a leading cause of long-term disability and a significant contributor to the global burden of disease. While physical impairments are often the most visible outcomes, the psychological impact—particularly post-stroke depression (PSD)—can be equally debilitating. Depression following a stroke affects approximately one-third of survivors and is associated with poorer functional outcomes, reduced quality of life, and increased mortality. Moreover, depression can negatively influence engagement in rehabilitation programs and hinder recovery of daily living activities, which are critical for regaining independence.

Cognitive Behavioural Therapy (CBT), a structured, time-limited psychotherapy approach, has been widely recognized for its effectiveness in treating depression and anxiety disorders in various populations. CBT focuses on identifying and modifying maladaptive thoughts and behaviours, thereby promoting more adaptive coping strategies. Its application in stroke rehabilitation has gained attention due to its potential to address the psychological challenges that many stroke survivors face, particularly depressive symptoms that interfere with motivation and functional recovery.

Emerging evidence suggests that CBT can significantly reduce depressive symptoms in stroke patients and may also improve their ability to perform activities of daily living (ADLs), such as bathing, dressing, and mobility. These improvements are vital, as they directly affect the patient's autonomy and overall well-being. However, the integration of CBT into standard post-stroke care is still limited, and further investigation is necessary to fully understand its therapeutic impact and optimal delivery.

Rationale of the Study

Recent studies have suggested that CBT not only reduces depressive symptoms in stroke patients but may also lead to improvements in daily functioning and engagement in rehabilitation activities. However, existing research remains limited and sometimes inconsistent, particularly regarding the extent of CBT's impact on activities of daily living (ADLs). Additionally, there is a need for more targeted exploration of how CBT can be effectively integrated into post-stroke care protocols.

This study is therefore essential to fill the gap in current literature by systematically examining the effects of CBT on both depression and functional outcomes in stroke patients. Understanding the dual impact of CBT on psychological well-being and day-to-day functioning will provide valuable insights for healthcare professionals, inform treatment planning, and support the development of more holistic rehabilitation programs for stroke survivors.

Aim and Objectives

Aim:

Aim is to evaluate the effectiveness of cognitive behavioral therapy (CBT) in managing depression and enhancing activities of daily living (ADLs) among individuals recovering from stroke.

Objectives:

1. To determine screening score of cognitive function through The Mini-Mental State Examination (MMSE)
2. To compare Pretest and Post-Test score of depression through Beck Depression Inventory

Research Methodology

Study Type:
This research is a pre- and post-test treatment/intervention-based study.
Study Design:
The study employs a quasi-experimental pre-post design to evaluate the effectiveness of Cognitive Behavioral Therapy (CBT) on stroke patients.
Sample Size:
A total of 60 stroke patients were included in the study, all meeting the specified inclusion and exclusion criteria.
Study Duration:
The study was conducted over a period of 12 months.
Sampling Criteria:

- **Inclusion Criteria:**
  - Age range: 50–60 years
  - Confirmed diagnosis of stroke (via medical records or clinical assessment)
  - Mini-Mental State Examination (MMSE) score > 11 points
  - Willingness to participate in the trial and provide informed consent
- **Exclusion Criteria:**
  - Uncooperative patients or inability to engage in therapy
  - Mini-Mental State Examination (MMSE) score < 11 points
  - Severe physical or neurological conditions preventing participation (e.g., coma, severe aphasia)

Sampling Technique:
A convenience sampling technique was utilized to recruit participants, based on availability and accessibility within stroke rehabilitation centers or outpatient clinics.
Variables:

- **Dependent Variables:** Depression, Activities of Daily Living (ADL)
- **Independent Variable:** Cognitive Behavioral Therapy (CBT)

Screening Tool:

- **Mini-Mental State Examination (MMSE):** The MMSE is a concise, standardized tool used to assess cognitive function. It is particularly valuable for identifying cognitive impairment in stroke patients and other neurological conditions, ensuring participants have sufficient cognitive capacity to engage in CBT.

Statistical Analysis:

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 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 Screening Tool (MMSE)

Screening Tool (MMSE)	
Mean	19.08
Standard Error	0.329303532
Standard Deviation	2.328527607
Sample Variance	5.422040816

The (MMSE) was used to assess cognitive function, with the results indicating an average (mean) score of **19.08** among participants. The **standard error** of **0.33** suggests a relatively small variability in the sample mean, indicating that the sample mean is a reliable estimate of the population mean. The **standard deviation**, measuring the dispersion of scores around the mean, was **2.33**, reflecting some degree of variability in cognitive function among participants.

Results and Discussion

Cognitive function was assessed using the Mini-Mental State Examination (MMSE), with participants achieving a mean score of 19.08. The standard error of the mean was 0.33, indicating low variability and suggesting that the sample mean is a reliable estimate of the population mean. The standard deviation of 2.33 reflects a moderate spread of scores around the mean, while the sample variance of 5.42 provides further quantification of this variability. Overall, these metrics point to some degree of variation in cognitive function among participants. Given that the observed mean score falls below commonly accepted MMSE cutoff values for normal cognitive function, the results may indicate a level of cognitive impairment within the studied population.

Conclusion

The MMSE results revealed a mean score indicative of potential cognitive impairment among the participants, supported by statistical measures reflecting moderate variability within the sample. The low standard error underscores the reliability of the mean as a representative estimate, while the standard deviation and variance highlight measurable differences in cognitive performance across individuals. These findings underscore the importance of routine cognitive screening, particularly in populations at risk, to facilitate early identification and intervention for cognitive decline.

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