



Faculty of medicine  
University of Dhaka

**Evaluating The Effectiveness of Dialectical Behavior Therapy along with Usual  
Physiotherapy Intervention on Emotional Regulation and coping Skills Among  
Stroke Survivors**

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**“Evaluating The Effectiveness of Dialectical Behavior Therapy Along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors”**

Submitted by Md Azharul Islam for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc in PT)

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## DECLARATION

I am Md. Azharul Islam. I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication or dissemination of information about the study, I would be bound to obtain the written consent of my supervisor.

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## Acronyms

<b>ASA:</b>	American Stroke Association
<b>B.Sc.:</b>	Bachelor of Science
<b>BMRC:</b>	Bangladesh Medical Research Council
<b>CBT:</b>	Cognitive Behavioral Therapy
<b>DBT:</b>	Dialectical Behavior Therapy
<b>DU:</b>	University of Dhaka
<b>IRB:</b>	Institutional Review Board
<b>QoL:</b>	Quality of Life
<b>RCT:</b>	Randomized Controlled Trial
<b>SCMST:</b>	Saic College of Medical Science and Technology
<b>SPSS:</b>	Statistical Package for Social Science
<b>WHO:</b>	World Health Organization

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## Abstract

**Background:** Stroke causes long-term disability, often leaving emotional dysregulation and poor coping unaddressed. Dialectical Behavior Therapy (DBT) can enhance emotional regulation and coping in stroke rehabilitation. **Objectives:** To evaluate the effectiveness of DBT combined with usual physiotherapy on emotional regulation, coping skills, and functional independence among stroke survivors. **Methodology:** This experimental study utilized a pretest-posttest design with two groups: an Experimental group (DBT + Physiotherapy) and a Control group (Physiotherapy only). A total of 20 participants were randomly assigned to these groups. The Experimental group received DBT sessions alongside conventional physiotherapy, while the Control group received only conventional physiotherapy. The intervention consisted of eight weekly DBT sessions focused on mindfulness, emotional regulation, distress tolerance, and interpersonal effectiveness, integrated with standard physiotherapy exercises. Outcome measures included the Brief COPE Scale for coping skills, Satisfaction Scale for intervention evaluation, and Functional Independence Measure (FIM) for functional recovery. Data analysis was conducted using paired t-tests and independent t-tests to assess intergroup and intragroup differences via SPSS software. **Results:** The Experimental group demonstrated significant improvements in coping skills ( $p < 0.001$ ), emotional regulation, and satisfaction scores compared to the Control group. Post-intervention FIM scores revealed greater functional independence in the Experimental group ( $p < 0.05$ ). The findings highlight the added benefits of integrating DBT with conventional physiotherapy. **Conclusion:** The study demonstrated that the integration of DBT with conventional physiotherapy significantly enhanced emotional regulation, coping skills, and functional independence in stroke survivors compared to physiotherapy alone. These findings suggest that DBT can be a valuable adjunct to traditional physiotherapy for stroke rehabilitation.

**Keywords:** Stroke rehabilitation, Dialectical Behavior Therapy (DBT), Emotional regulation, Coping skills, Stroke survivors, Mental health in rehabilitation, Holistic stroke recovery

**1.1 Background**

Currently, stroke is the third largest cause of disability and the second leading cause of death globally, as acknowledged by the establishment of structured inpatient (stroke unit) treatment in 2013. Due to enhanced medical treatment, the problems associated with acute stroke are diminishing, leading to a reduction in stroke death rates; nonetheless, the rates of residual impairment after stroke are on the rise. Currently, around 75% of individuals survive a first stroke, with 25% experiencing modest deficits and 40% reporting moderate to severe disabilities. Furthermore, stroke patients face the potential for repeated strokes, an elevated risk of mortality, and increased disability (Ovbiagele et al. 2014, p. 207).

The World Health Organization reports that annually, 15 million individuals globally have a stroke. Five million individuals perish, and an additional five million have lifelong disabilities (Aydin et al. 2016, p. 10). The disability rates among stroke survivors range from 24% to 54% (Srivastava et al. 2015, p 48 ). According to WHO 2001, 86% of fatalities in underdeveloped countries were attributable to stroke (Wasay et al. 2014, p. 25).

Globally, about two-thirds of patients succumbed to stroke in underdeveloped countries (Liu et al., 2007). Of the 162.2 million people in Bangladesh, the majority (74%) reside in rural areas, while just 26% inhabit metropolitan regions. Stroke has been identified as the third leading cause of mortality behind coronary heart disease and infectious disorders. The death rate for stroke patients rose from 6.00% in 2006 to 8.57% in 2011, accompanied by an age-adjusted mortality rate of 108.31 per 100,000 individuals in 2011 (Islam et al. 2014, p. 1087). The National Commission on Macroeconomics and Health predicts that India would see 1.67 million stroke incidents by 2015. The Global Burden of Disease Study indicated that by 2020, stroke-related fatalities in India would surpass those in established market economies (Prasad et al. 2012, p. 81). Cerebrovascular disease is the fourth biggest cause of mortality in Singapore, with an increasing trend and a prevalence of 6.6% in 2016 (Lui & Nguyen. 2018, p. 549).

From 1990 to 2010, the incidence of stroke grew by 19%, and current forecasts suggest that global mortality will rise to 7.8 million by 2030 (Organised inpatient (stroke unit) treatment for stroke, 2013, p.14). It is projected that during the next twenty years, the global incidence of stroke-related costs would increase; nevertheless, significant advancements in stroke medical therapy are likely to alleviate the crisis (Langhorne et al., 2011). Van et al. (2015, p. 547) indicated that by 2050, the population of stroke patients is expected to rise significantly, with around 50% of these individuals likely to need help in their activities of daily living within 12 months. Despite significant advancements in contemporary medicine, pharmaceuticals, and medical technology, the worldwide incidence of stroke presents a considerable risk of death and morbidity for individuals, along with an increasing economic burden on society. Globally, stroke is recognized as the second foremost cause of mortality, associated with a history of ischemic heart disease, accounting for roughly 6.7 million stroke-related deaths in 2015 (Lui & Nguyen. 2018, p. 70).

Stroke is a lethal condition resulting from lingering brain damage, leading to significant physical impairment or mortality (Mukherjee & Patil. 2011, p. 749). In neurology, the cerebrum is a vital area, since it is complex in life processes, memory, and function. As one ages, the brain becomes susceptible to many perilous disorders, necessitating constant work and resilience to address this complicated challenge. Currently, stroke is a critical concern in this century, serving as a significant cause of mortality and the primary contributor to disability in Bangladesh (Mohammad. 2019, p. 58).

Stroke is primarily categorized as hemorrhagic or non-hemorrhagic. Intracerebral hemorrhage (ICH) accounts for 10% to 15% of all strokes. The rupture of cerebral arteries may lead to intracerebral hemorrhage (ICH), often resulting from severe hypertension affecting artery walls that have been compromised by atherosclerosis, aneurysms, or arteriovenous malformations. Ischemic strokes, or cerebral infarcts (CI), result from the formation of thrombi and/or emboli in arteries, leading to obstructions and subsequent oxygen deprivation in essential tissues. Insufficient cerebral circulation results in neuronal cellular damage, inflammatory reactions, and neuronal mortality. The subtype of each stroke (hemorrhagic vs non-hemorrhagic) may further be categorized; for instance, intracerebral hemorrhage (ICH) can be split into main and secondary types. Primary intracerebral hemorrhage arises from the spontaneous rupture

of tiny arteries damaged by amyloid angiopathy or persistent hypertension. Primary intracerebral hemorrhage accounts for 78% to 88% of all hemorrhages. Cerebrovascular hemorrhage, vascular anomalies, neoplasms, or effects of coagulation dysfunction Secondary Intracranial Hypertension (Perna & Temple. 2015, p. 248).

In a community-based research conducted in Sri Lanka, the prevalence of stroke is 1.0%. A hospital-based stroke series with 103 patients revealed the following pathology subtype distribution: 74.7% cerebral infarction, 19.1% intracerebral hemorrhage, and 62.2% subarachnoid hemorrhage, all verified by CT scan. Among the infarcts, 31 (42%) were cortical, 30 (41%) were lacunar, 12 (16%) were cerebellar and brainstem, and 1 (1.3%) was a border zone infarct. (Mohammad. 2019, p. 58).

The lifetime prevalence of stroke and transient ischemic attack (TIA) in Pakistan was 21.8%, which is significantly elevated (18.4–25.5) (Prasad et al. 2014, p. 547).

Numerous South Asian research indicated a greater incidence of hemorrhagic stroke (19-46%) in comparison to Western nations. This discovery may be linked to a deficiency of control and elevated prevalence of hypertension in South Asia. The incidence of intracerebral hemorrhage (ICH) due to stroke is notably high in younger patients (15–45 years of age), ranging from 32% to 43%. The incidence of ICH in Bangladesh was elevated. Cardioembolic stroke is more prevalent in Western nations than to South Asia (Wasay et al. 2014, p. 33). The latest assessment indicates that stroke is the sixth greatest cause of death in Malaysia. According to the National Stroke Registry, ischemic strokes are the prevalent kind, accounting for 73.3% of all stroke victims. The prevalence of small vascular disease has decreased from 62% in 2003 to 28% in 2012. The Korean Stroke Society reported ischemic stroke admissions of 64.7% in 2000 and 76.1% in 2009, indicating a progressive rise over time. The incidence of hemorrhagic strokes has gradually decreased. The Khorasan Stroke Registry was established in 2001 to examine stroke incidence and trends in Southern Khorasan. This research indicated that the annual incidence of stroke in Iran rose from 84.16 to 103.23 per 100,000 population between 2001 and 2005. The National Acute Stroke Israeli (NASIS) registry has recently released data about stroke, based on a cohort of 6,279 patients from 28 institutions nationwide. The authors reported a significant decrease in the incidence of small vessel strokes among adults aged above 85 years in Israel from

2004 to 2010. Stroke is among the top three primary causes of death in Thailand. The incidence rate of hemorrhagic stroke decreased from 22% in 2003 to 13% in 2012. Recent evidence indicates that the prevalence of cerebral atherosclerosis is very high, accounting for 52.6% of all ischemic strokes as the primary cause (Mehndiratta et al. 2014, p. 458).

Age is a critical and immutable risk factor for stroke. In the South Asian area, the mean age of stroke start is lower than in Western nations, with 59 years in Pakistan and 63 years in India, compared to 68 years in the USA and 71 years in Italy. This problem pertains not just to conventional risk variables but also to atypical risk factors. The prevalence of hypertension, diabetes, cardiovascular illnesses, and dyslipidemia in different nations is similar according to demographic factors. This location has encountered a dual challenge of tobacco exposure, with a smoking prevalence of 15–20% and up to 40% of those use chewing tobacco. A significant proportion of chewing tobacco users are women. Obesity is a pressing problem, with its prevalence alarmingly high, particularly in Sri Lanka. Data about atrial fibrillation, carotid artery disease, and intracranial illness in India and Pakistan are scarce. In younger individuals, many unconventional risk factors may contribute to a heightened incidence of stroke, including the usage of water pipes, desi ghee (saturated fatty acids), chewable tobacco, and infectious agents. (Wasay et al. 2014, p. 33).

Dialectical Behaviour Therapy (DBT) has shown potential in enhancing emotional control in stroke survivors (Linehan. 2018, p. 48). DBT, first formulated by Linehan (2018) for persons with borderline personality disorder who have undergone traumatic suicide attempts, amalgamates concepts from Zen practice, behaviorism, and dialectical theory. The treatment aims to assist people in regulating emotions, cultivating appropriate coping techniques, and managing life obstacles (Linehan, 2018, p. 178).

Dialectical Behaviour Therapy (DBT) posits that persons with heightened emotional sensitivity may have had early emotional invalidation, resulting in challenges in emotion regulation (Linehan, 2018, p. 173). DBT integrates biological and environmental models to address the physiological and environmental aspects that contribute to issues in emotional regulation. This comprehensive method has been modified for several emotional illnesses, particularly those encountered by stroke

patients, who often have heightened emotional sensitivity and challenges in adjusting to their altered living situations (Taylor et al. 2016, p. 473).

Dialectical Behaviour Therapy (DBT) has increasingly being used to manage emotional dysregulation in stroke patients during the last ten years. Survivors often endure sadness, anxiety, and emotional instability resulting from neurological alterations and the transformative effects of stroke; treatments such as DBT have shown considerable promise in facilitating recovery. Underscored the organised methodology of Dialectical Behaviour Therapy (DBT) in imparting emotional regulation skills, accentuating its effectiveness in populations experiencing emotional instability. These results provide a basis for implementing DBT for stroke patients, whose rehabilitation is often hindered by significant emotional difficulties (Neacsiu et al.2014, p. 230).

Emotional dysregulation, a prevalent post-stroke symptom, intensifies healing challenges. Dialectical Behaviour Therapy (DBT) significantly diminishes maladaptive coping mechanisms, such as avoidance, substituting them with constructive emotional responses. Through an emphasis on mindfulness and distress tolerance, DBT empowers survivors to manage their emotions effectively, enhancing engagement in recovery and overall results. Moreover, the therapy's emphasis on cognitive reappraisal facilitates the restructuring of negative thinking patterns, which is essential for stroke patients who often encounter dissatisfaction and identity issues throughout their rehabilitation. (Southward et al. 2023, p. 478)

Group therapy sessions, an essential element of DBT, have shown considerable advantages for stroke survivors. The use of group DBT sessions for dyads of stroke survivors and their carers, revealing enhancements in emotional regulation among survivors and a decrease in carer stress. These sessions cultivate a feeling of community and reciprocal support, which are sometimes absent for stroke patients experiencing social isolation. (Bannon et al.2020, p. 218). The significance of group-based DBT in enhancing treatment adherence, especially among those who may otherwise eschew psychological therapies (Wibbelink et al. 2022, p. 458).

Stroke therapy requires a comprehensive strategy, tackling both physical and psychological obstacles. Incorporating DBT within multidisciplinary care frameworks amplifies its effectiveness. The integration of DBT with physiotherapy enhanced

adherence to physical treatment and emotional stability. This synergy highlights the significance of psychological therapies in enhancing physical healing. (Taheri et al. 2020, p. 817)

Stroke rehabilitation often constitutes a lifetime effort, accompanied by persistent emotional and psychological difficulties. Research shown that Dialectical Behaviour Therapy's emphasis on mindfulness and emotional control provides survivors with enduring coping mechanisms. These skills are essential for handling the enduring emotional swings that may last for years after the original stroke episode (Gladwyn-Khan 2019, p. 148).

Technological improvements have enhanced the accessibility of DBT, particularly for stroke patients with mobility challenges. Online DBT courses, finding similar effectiveness to face-to-face sessions. Digital technologies, such as smartphone apps and gamified mindfulness exercises, not only augment user involvement but also mitigate practical obstacles, such as transportation challenges. Modifying DBT to address the specific requirements of stroke survivors increases its effectiveness. (Norman-Nott et al. 2022, p. 79) the advantages of customizing DBT components, including psychoeducation for stroke-related emotional difficulties. These modifications guarantee that survivors have tailored treatment that specifically targets their distinct stresses, including loss of autonomy and changes in roles (Foroughi et al. 2021, p. 38)

Stroke survivors often encounter significant emotional dysregulation, which may present as mood fluctuations, irritability, and depressed episodes. This emotional instability arises from neurological alterations and the psychological consequences of stroke, including the loss of autonomy and identity. The efficacy of DBT in individuals exhibiting severe emotional dysregulation, underscoring its systematic methodology for fostering emotional stability. For stroke survivors, emotional regulation assists in addressing psychological issues and enhances participation in physical rehabilitation programs (Neacsiu et al. 2014, p. 48).

Southward et al. (2023, p. 59) emphasized the significance of mindfulness and cognitive reappraisal in Dialectical Behaviour Therapy (DBT), which empower survivors to reframe their experiences and concentrate on positive recovery achievements. These tactics are very effective in mitigating detrimental thinking habits that may obstruct the

healing process. By confronting these emotional obstacles, DBT cultivates resilience and promotes a more equitable approach to rehabilitation.

Effective coping is essential for stroke survivors, who encounter substantial lifestyle changes and enduring disability. Coping techniques are essential for addressing these problems, with adaptive solutions associated with improved psychological outcomes. Dialectical Behaviour Therapy (DBT) enhances coping abilities by imparting distress tolerance strategies, enabling patients to withstand challenging emotions without engaging in maladaptive behaviors such as avoidance or denial (Taheri et al. 2020, p. 4125).

The impact of DBT in improving dyadic coping among stroke survivors and their careers. The research indicated that dyads engaged in DBT exhibited enhanced communication, less stress, and fortified interpersonal bonds. These results highlight the systemic advantages of DBT, since enhancing carer well-being indirectly facilitates the survivor's rehabilitation (Bannon et al. 2020, p. 1430)

Group therapy, an essential component of DBT, offers a valuable opportunity for stroke survivors to engage with others with analogous difficulties. Group-based Dialectical Behaviour Therapy significantly decreased feelings of loneliness and enhanced participants' sense of belonging. This is especially crucial for stroke patients, who often experience social isolation owing to mobility constraints or communication challenges (Hinwood et al. 2023, p. 187).

Wibbelink et al. (2022, p. 430) highlighted the advantages of group therapy in enhancing compliance with DBT procedures. The research indicated that survivors who engaged in group sessions had a higher likelihood of completing treatment, as the supportive atmosphere encouraged their continued participation. These results indicate that group-based DBT not only tackles emotional difficulties but also improves the efficacy of therapeutic therapies.

The use of technology into DBT has enhanced its accessibility and outreach, especially for stroke patients facing mobility difficulties. Effectiveness of online DBT programs and found results equivalent to those of in-person sessions. Digital solutions, like mobile applications and telemedicine platforms, facilitate access to treatment for

survivors, particularly in remote or disadvantaged regions (Norman-Nott et al. 2022, p. 148).

Furthermore, gamified DBT exercises, including interactive mindfulness and distress tolerance tasks, have been investigated to improve involvement. Foroughi et al. (2021, p. 208) revealed that these digital innovations enhance user retention and provide a cost-efficient method for providing high-quality psychological therapy to stroke survivors.

Stroke recovery requires a comprehensive strategy that encompasses both physical and psychological aspects. The incorporation of DBT into these models has shown advantages. Taheri et al. (2020, p. 10) investigated the interplay between Dialectical Behaviour Therapy (DBT) and physiotherapy, revealing that patients receiving both treatments exhibited greater compliance with rehabilitation protocols and accelerated functional recovery.

Braden et al. (2022, p. 930) examined the integration of Dialectical Behaviour Therapy (DBT) with behavioural health treatments, including weight control programs, for those experiencing emotional eating. The research indicated enhanced emotional control and physical health results, underscoring DBT's versatility across many therapy settings. The data indicate that including DBT into comprehensive stroke treatment models may improve recovery outcomes.

Stroke survivors may have persistent emotional and psychological difficulties far beyond the initial healing stage. Gladwyn-Khan (2019, p. 93) discovered that Dialectical Behavior treatment (DBT) provides patients with enduring coping mechanisms that remain advantageous even after the conclusion of treatment. This is especially crucial for addressing the persistent emotional variances and pressures linked to prolonged stroke rehabilitation.

Customizing DBT to tackle stroke-specific issues, such as modifying psychoeducation modules to include details on the neurological and emotional consequences of stroke, significantly improves its effectiveness. Foroughi et al. (2021, p. 178) emphasized that these changes enhance the relevance and efficacy of DBT for this group.

Stroke continues to pose a considerable worldwide health concern, significantly affecting the physical and mental well-being of survivors (Ovbiagele et al. 2014, p.

103). Due to the emotional regulation difficulties encountered by many stroke survivors, treatments such as Dialectical Behaviour Therapy provide a viable method for enhancing coping skills and emotional health, which are crucial for comprehensive rehabilitation (Linehan, 2018, p. 487).

## **1.2 Rationale:**

Stroke is a leading cause of long-term disability in Bangladesh, affecting thousands of individuals annually and placing a substantial burden on families and the healthcare system. While physiotherapy is a key component of stroke rehabilitation in the country, its primary focus is on physical recovery, often neglecting the emotional and psychological challenges faced by stroke survivors. Emotional dysregulation and inadequate coping skills are common among this population, further diminishing their quality of life and increasing dependency on caregivers.

Dialectical Behavior Therapy (DBT), developed by Marsha Linehan in the 1970s, has demonstrated effectiveness in addressing emotional dysregulation in various psychiatric conditions, especially borderline personality disorder. DBT's structured framework, which integrates cognitive-behavioral techniques with mindfulness practices, offers a promising approach to improving emotional regulation and coping skills. However, in Bangladesh, the application of DBT for stroke survivors remains unexplored, despite the pressing need for interventions targeting the psychological dimensions of recovery. Incorporating DBT into physiotherapy for Bangladeshi stroke survivors could address these unmet psychological needs, offering a more holistic approach to rehabilitation. This study aims to bridge this gap by evaluating the impact of DBT alongside standard physiotherapy on emotional regulation and coping skills in stroke survivors in Bangladesh. Through a mixed-methods approach, the research will explore how DBT can enhance traditional physiotherapy practices within the local context. Given the high prevalence of stroke and its associated psychological challenges in Bangladesh, it is critical to explore innovative, culturally appropriate interventions. This research has the potential to redefine rehabilitation practices in the country, improve the well-being and quality of life of stroke survivors, and reduce the caregiving burden. The findings could also inform national rehabilitation policies and inspire future research, fostering a more comprehensive approach to stroke recovery in Bangladesh.

### **1.3 Operational definition**

#### **Stroke**

A stroke is a medical emergency caused by an interruption in the brain's blood supply, either due to a blockage or a rupture of a blood vessel. This leads to brain cell death from lack of oxygen and nutrients. Symptoms and severity vary, but immediate treatment is always necessary. Stroke survivors, the focus of my research, are those recovering from this condition, experiencing a range of physical, cognitive, and emotional effects.

#### **Dialectical behavior therapy**

Dialectical Behavior Therapy (DBT) is a type of cognitive behavioral therapy that is structured and education-focused. It is designed to help individuals manage intense emotions and improve social relationships. Originally developed for treating borderline personality disorder, DBT has been adapted for other mental health conditions<sup>3</sup>. It teaches people to live in the moment, develop healthy ways to cope with stress, regulate their emotions, and improve their relationships.

#### **Emotional regulation**

Emotional Regulation refers to the conscious or unconscious processes of monitoring, evaluating, modulating, and managing emotional experiences and expressions in terms of intensity, form, and duration of feelings, emotion-related physiological states, and behaviors. It involves strategies such as rethinking a challenging situation to reduce anger or anxiety, hiding visible signs of sadness or fear, or focusing on reasons to feel happy or calm. In my research, emotional regulation pertains to how stroke survivors manage their emotional experiences and expressions as part of their recovery process.

#### **Coping skill**

Coping Skills are the actions, series of actions, or thought processes used in managing stressful or unpleasant situations. They involve a conscious and direct approach to problems, and are the efforts made to manage situations appraised as potentially harmful or stressful.

#### **1.4 Research question:**

Is dialectical behavior therapy along with usual physiotherapy intervention effective on emotional regulation and coping skills?

### **1.5 Aim of the study:**

The aim of the study was to investigate the effectiveness of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors

## **1.6 Objective:**

- **General objective:**

- ✓ To compare the effectiveness of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors in Dhaka city.

- **Specific objectives:**

- ✓ To determine the socio-demographic status and medical information of participants.
- ✓ To determine the functional status of the patients of experimental group by functional independence measurement (FIM) scale before & after intervention.
- ✓ To Assess the level of emotional regulation & coping skills of the participants of experimental & control group by brief cope scale before & after intervention.
- ✓ To collect feedback from participants regarding their satisfaction with the combined intervention and its perceived benefits.

## **1.7 Hypothesis:**

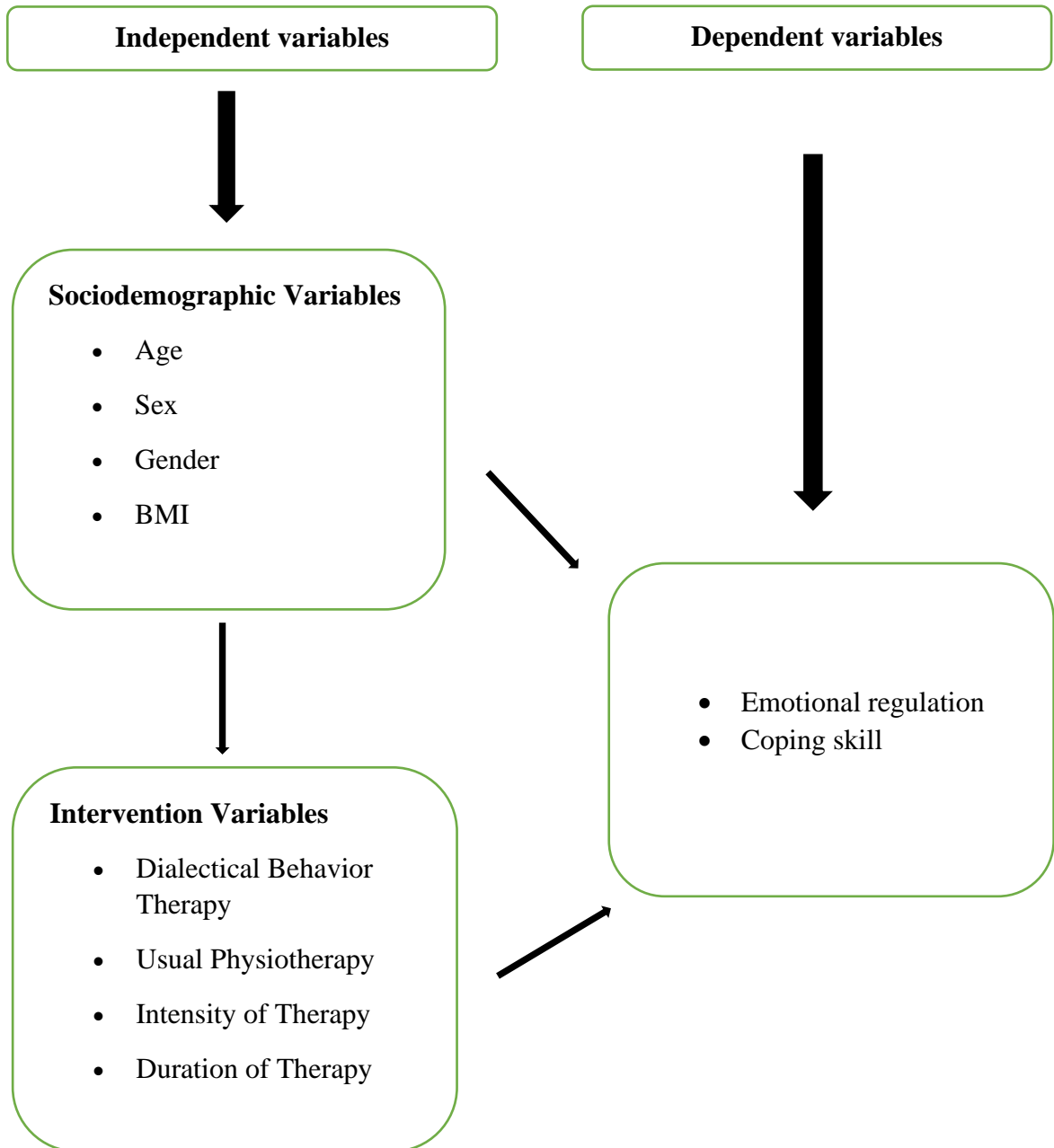
### **1.7.1 Null hypothesis ( $H_0$ ): $\mu_1 - \mu_2 \neq 0$ or $\mu_1 \neq \mu_2$**

Dialectical behavior therapy along with usual physiotherapy intervention is not effective on emotional regulation and coping skills.

### **1.7.2 Alternative hypothesis ( $H_1$ ): $\mu_1 - \mu_2 = 0$ or $\mu_1 \geq \mu_1$**

Dialectical behavior therapy along with usual physiotherapy intervention is effective on emotional regulation and coping skills.

## 1.8 Conceptual framework:



Stroke is a common global neurological condition and a primary cause of disability and mortality globally. The World Health Organization (WHO) defines stroke as a clinical syndrome characterized by the swift onset of focal (or global, in the case of coma) disturbances in cerebral function that persist for over 24 hours or result in death, with no evident cause other than a vascular origin (WHO, 2021). An interruption of blood flow to the brain occurs, either from a blockage (ischemic stroke) or from bleeding (hemorrhagic stroke) (Gayer & Gomes et al. 2009, p. 1258). Stroke impacts millions worldwide, with over 15 million cases annually, leading to 5 million fatalities and 5 million survivors enduring lasting disability (Van der Riet et al. 2015, p. 74).

Stroke results in substantial physical disabilities, including compromised motor function, balance difficulties, and restricted mobility, as well as considerable psychosocial concerns. Emotional discomfort, including sadness, anxiety, and post-traumatic stress, is prevalent among stroke patients and may substantially impede recovery (Gelaw et al. 2019, p. 10). The enduring effects of stroke may significantly affect the financial and emotional well-being of both survivors and their families (Duncan et al., 2019). About 40% of stroke survivors endure moderate disability, while up to 30% encounter severe functional impairment (Duncan et al. 2019, p. 451). These issues highlight the need for treating both physical and psychological dimensions of healing (Whitehead & Baalbergen, 2019, p. 120).

Coping techniques are vital for stroke survivors to address the emotional and psychological effects of their disease. Coping methods may be categorized into problem-focused and emotion-focused approaches. Problem-focused coping targets the underlying source of stress, while emotion-focused coping pertains to regulating emotional reactions to stressful circumstances. Research demonstrates that stroke survivors often use a blend of coping strategies; nevertheless, those who engage in positive, adaptive coping techniques tend to have superior psychological results and an enhanced quality of life (Lo Buono et al. 2017, p. 17).

Psychological stress significantly influences stroke recovery since persistent stress is associated with worse emotional and physical health outcomes, including depression

and cognitive impairment (Gyawali et al. 2020, p. 59). Research indicates that the stress linked to stroke, particularly with mobility challenges, enduring disabilities, and caregiving duties, might impede recovery and exacerbate long-term results. Consequently, proficient emotional regulation and coping mechanisms are essential for enhancing the quality of life (QoL) of stroke survivors (Hama et al. 2011, p. 780).

Stroke survivors face diverse problems that extend beyond physical disabilities, with emotional dysregulation and psychological stress serving as significant obstacles to rehabilitation (Gelaw et al., 2019, p. 4589). The use of psychological therapies, such as Dialectical Behaviour Therapy (DBT), in rehabilitation programs has shown potential in tackling these issues. Dialectical Behaviour Therapy (DBT), first formulated by Linehan (1993, p. 83), is a cognitive-behavioral intervention aimed at improving emotional control, mindfulness, and interpersonal efficacy.

Study underscored the organized methodology of Dialectical Behaviour Therapy (DBT) for emotional regulation, accentuating its efficacy in groups exhibiting considerable emotional dysregulation. This approach has been effectively modified for non-psychiatric disorders, including chronic pain and cardiac rehabilitation, and shows applicability for stroke survivors (Neacsiu et al. 2014, p. 5549). Dialectical Behaviour Therapy (DBT) in chronic pain treatment, finding that skills training resulted in substantial decreases in stress and emotional instability, akin to the difficulties encountered by stroke survivors (Norman-Nott et al. 2022, p. 3399).

A controlled study of Dialectical Behaviour Therapy (DBT) in individuals with myocardial infarction, revealing significant enhancements in coping mechanisms and perceived stress levels. The similarities between cardiovascular and cerebrovascular disorders indicate the possible relevance of DBT for stroke rehabilitation (Taheri et al. 2020, p. 8301). Study on psychological stress management in stroke survivors, highlighting Dialectical Behaviour Therapy (DBT) as a significant intervention for enhancing resilience and emotional regulation (Hinwood et al. 2023, p. 720).

The use of DBT in dyadic contexts, including carers and patients, has been investigated. "Recovering Together" program and determined that DBT-based therapies improved emotional support and coping mechanisms for carers and stroke patients. These results

highlight the comprehensive advantages of DBT in tackling the wider psychosocial effects of stroke (Bannon et al. 2020, p. 259).

Bibliotherapy and self-administered DBT therapies for stroke patients, finding that structured DBT exercises significantly alleviated emotional discomfort (Gladwyn-Khan. 2019, p. 48). Psychological flexibility, emotional regulation, and coping mechanisms in carers, emphasizing the significance of DBT in promoting adaptive stress responses (Simpson. 2019, p. 903).

Recent modifications of Dialectical Behaviour Therapy for various populations provide more insights. The need for mitigating maladaptive coping strategies, which corresponds with the requirements of stroke survivors facing emotional dysregulation (Southward et al. 2023, p. 490). The research emphasized the cost-effectiveness and scalability of group-based Dialectical Behaviour Therapy methods (Southward et al. 2023, p. 198).

Use of DBT to drug use disorders, illustrating the therapy's adaptability in managing emotion control deficiencies. The results indicate that the fundamental concepts of DBT may be adapted to several therapeutic settings, including post-stroke rehabilitation (Foroughi et al. 2021, p. 5413). Dialectical Behaviour Therapy in weight reduction programs for persons with emotional eating, demonstrating improvements in emotional control and behavioural results. These results are important for stroke patients who may have analogous issues, such as eating practices influenced by depression (Braden et al. 2022, p. 9410).

The integration of dialectical behaviour therapy for individuals with personality disorders, highlighting the interplay between cognitive and behavioural techniques in fostering emotional stability. These findings are essential for formulating interdisciplinary strategies in stroke recovery (Wibbelink et al. 2022, p. 4518).

Dialectical Behaviour Therapy (DBT) is an empirically supported therapy modality created by Marsha Linehan in the late 1980s for the treatment of patients with borderline personality disorder and persistent suicidality (Linehan. 1993, p. 4158). Dialectical Behaviour Therapy (DBT) is an adaptation of cognitive-behavioral therapy (CBT) that prioritizes emotional regulation, mindfulness, and distress tolerance (Fassbinder et al. 2016, p. 302).

Its objective is to assist people in regulating extreme emotional reactions, cultivating better coping strategies, and enhancing interpersonal connections. Dialectical Behaviour Therapy (DBT) is especially advantageous for persons exhibiting considerable emotional dysregulation, including those diagnosed with borderline personality disorder (Fassbinder et al. 2016, p. 9631).

The use of Dialectical Behaviour Therapy (DBT) in rehabilitation programs for stroke survivors has garnered considerable interest owing to its evidence-based effectiveness in improving emotional regulation and coping abilities. Emotional dysregulation, a prevalent issue among stroke patients, often complicates recovery by obstructing rehabilitation participation and diminishing quality of life. Recent studies underscore the significant impact of DBT in tackling these issues by emphasizing psychological resilience and adaptive coping strategies (Hinwood et al. 2023, p. 309).

Dialectical Behaviour Therapy's systematic emphasis on mitigating maladaptive coping strategies is especially pertinent for stroke patients experiencing considerable emotional suffering (Southward et al. 2023, p. 559). Stroke survivors often experience emotions of powerlessness, frustration, and loss of identity, leading to maladaptive behaviours such as avoidance or emotional detachment. DBT's focus on mindfulness and distress tolerance provides a means to disrupt these patterns, enabling survivors to navigate their recovery with enhanced emotional stability (Bannon et al. 2020, p. 4930).

Depression and anxiety are common in stroke survivors, with prevalence rates ranging from 30% to 50% in some studies (Lo Buono et al. 2017, p. 4950). The therapy methods of DBT, including mindfulness and emotional regulation training, have shown success in addressing comorbid psychiatric disorders. Self-guided DBT therapies have been emphasized as effective in alleviating depressive symptoms in stroke patients, demonstrating significant enhancements in emotional regulation throughout a 12-week intervention period (Gladwyn-Khan. 2019, p. 44169). Similarly, the efficacy of DBT in cultivating a supportive atmosphere for carers of stroke patients has been documented, highlighting its potential to promote recovery (Simpson. 2019, p. 20).

Inadequate emotional management may lead to withdrawal from physiotherapy and other critical rehabilitation therapies. Stroke survivors participating in DBT-based therapies exhibit greater compliance with therapeutic regimens. Dialectical Behaviour Therapy (DBT) equips patients with abilities to endure suffering and control emotional

reactions effectively, so facilitating constant engagement in their physical rehabilitation (Hinwood et al. 2023, p. 4169).

The amalgamation of DBT with other treatment methods has shown potential efficacy. The integration of DBT skills training with behavioural weight-loss therapies in individuals with obesity, noting substantial decreases in emotional eating and stress-related maladaptive behaviours. The efficacy of integrative techniques underscores the promise of analogous interdisciplinary tactics in stroke treatment, whereby DBT may enhance physiotherapy and occupational therapy to tackle both physical and emotional aspects of rehabilitation (Braden et al. 2022, p. 53).

Group-based DBT therapies have shown notable efficacy, providing stroke patients with an opportunity to exchange experiences and cultivate a feeling of community. The effects of group-based schema and DBT treatments on individuals with personality disorders, seeing notable improvements in emotional control and interpersonal abilities. This research, while centered on a non-stroke population, highlights the wider relevance of DBT group sessions, which might be adapted for stroke survivors to improve emotional well-being and facilitate social reintegration (Wibbelink et al. 2022, p. 5529)

The emergence of telemedicine and internet platforms has enhanced the accessibility of DBT, especially for those with mobility impairments. Effectiveness of online DBT modules for chronic pain management, revealing findings similar to those of in-person treatment. These results have considerable significance for stroke survivors, who often encounter logistical and physical obstacles in obtaining conventional treatment services. The online provision of DBT might guarantee that a greater number of persons benefit from its evidence-based methodologies (Norman-Nott et al. 2022, p. 329).

Individuals who have survived a stroke may have enduring emotional and psychological difficulties. Taheri et al. (2020, p. 30) shown that Dialectical Behaviour Therapy (DBT) may provide enduring advantages, even under persistent situations. The research indicated that patients maintained enhanced coping abilities and decreased stress levels one-year post-intervention. The sustained effectiveness underscores DBT's potential to serve a pivotal function in the continuum of stroke treatment, connecting acute recovery with continuous emotional support. Although DBT is well-regarded for its flexibility, customizing its elements to the specific circumstances of stroke survivors

may augment its effectiveness. The emphasis of DBT on emotion regulation and distress tolerance was especially effective when tailored to mitigate the loss of autonomy and identity often associated with stroke. Integrating stroke-specific psychoeducation into DBT frameworks might enhance its significance and results (Foroughi et al. 2021, p. 90).

Dialectical Behaviour treatment (DBT) has numerous essential elements, including individual treatment that targets personal challenges and emotional control. Skills training groups that instruct patients in mindfulness, emotional control, distress tolerance, and interpersonal effectiveness. Consultation outside of regular hours that offers continuous assistance between sessions. Meetings of the therapist team that guarantee alignment in their treatment methodologies (O'Connell & Dowling, 2014, p. 93). These components aim to mitigate emotional dysregulation, a fundamental characteristic of several psychiatric disorders, including borderline personality disorder and post-stroke emotional challenges (Rizvi et al. 2013, p. 369).

While DBT was first designed for patients with personality problems, its concepts are particularly relevant to stroke survivors, who often have substantial emotional difficulties. Post-stroke melancholy, anxiety, and mental instability are prevalent and may significantly impede recovery (Gelaw et al. 2019, p. 63). DBT's emphasis on emotion regulation and distress tolerance makes it an effective therapy method for addressing these challenges in stroke patients (Rizvi et al. 2013, p. 369).

Linehan's biosocial theory (1993a) posits that emotional dysregulation arises when people possess a biological predisposition to increased emotional sensitivity, along with an environment that invalidates their emotional experiences. In stroke survivors, the challenges of managing physical impairment, diminished independence, and changes in personal identity may intensify emotional dysregulation, rendering Dialectical Behaviour Therapy (DBT) a beneficial intervention for enhancing emotional regulation and coping mechanisms (Rizvi et al. 2013, p. 369).

Emotion regulation denotes the capacity to control and adjust one's emotional responses, particularly those that are extreme or unsuitable for the context. Studies indicate that those with deficient emotion regulation abilities are at a heightened risk for depression, anxiety, and other adverse psychological consequences (Gratz &

Roemer, 2004, p. 50). Stroke survivors with inadequate emotional control may have secondary deficits, including less participation in rehabilitation and social disengagement, adversely affecting recovery (Gross, 1998, p. 52).

Effective coping methods, including soliciting social support, engaging in problem-solving, and practicing acceptance, are essential for adjusting to the obstacles posed by stroke (Lo Buono et al. 2017, p. 90). Research indicates that adaptive coping methods might improve quality of life (QoL) in stroke survivors by alleviating emotional distress and enhancing recovery outcomes (Yu et al. 2013, p. 202). DBT's emphasis on enhancing emotion regulation and coping mechanisms directly addresses these concerns, possibly facilitating both psychological and physical rehabilitation for stroke patients (Rizvi et al. 2013, p. 558).

Recent research has highlighted the significance of psychological outcomes in stroke rehabilitation, revealing that quality of life (QoL) and subjective well-being are significantly affected by emotional regulation and coping skills. Although functional recovery after stroke is crucial, the emotional and psychological well-being of survivors is as significant in influencing long-term results (Lo Buono et al. 2017, p. 55).

Psychological stress is seen as a significant impediment to rehabilitation, since it leads to diminished cognitive function, depression, and reduced physical activity (Gyawali et al. 2020, p. 78). Consequently, enhancing coping mechanisms and emotional regulation via treatments such as Dialectical Behaviour Therapy (DBT) may markedly improve the psychological and functional rehabilitation of stroke patients (Hama et al. 2011, p. 73).

Stroke is a major worldwide health concern, resulting in both physical and psychological difficulties for survivors. Effective emotional regulation and coping strategies are essential for rehabilitation, and Dialectical Behaviour Therapy (DBT) offers a potential strategy for stroke patients facing emotional discomfort. DBT's emphasis on enhancing emotion control, distress tolerance, and interpersonal effectiveness might assist stroke survivors in navigating the emotional and psychological difficulties often associated with physical recovery. By augmenting coping techniques, Dialectical Behavior Therapy (DBT) may substantially enhance the quality of life and recovery results for stroke patients (Rizvi et al. 2013, p. 88; Linehan,

1993, p. 20).

The use of Dialectical Behaviour Therapy (DBT) to manage emotional dysregulation and enhance coping abilities in stroke survivors has advanced considerably during the last ten years. Stroke often results in survivors contending with both physical impairments and significant psychological effects, including sadness, anxiety, and identity crises (Gelaw et al. 2019, p. 206). These psychological obstacles need comprehensive rehabilitation treatments, with Dialectical Behaviour Therapy (DBT) emerging as a potential intervention owing to its systematic focus on emotional regulation, mindfulness, and distress tolerance (Linehan, 1993, p. 44).

The fundamental methods of DBT emphasise instructing people in emotional regulation, distress tolerance, and the enhancement of interpersonal efficacy. Neacsiu et al. (2014, p. 55) recognised these aspects as crucial for mitigating emotional dysregulation across many groups, including those with chronic health issues. Dialectical Behaviour Therapy (DBT) equips stroke patients with strategies to regulate emotional dysregulation, mitigate feelings of despair, and recontextualise maladaptive cognitive habits. Emotional instability is crucial as it might impede rehabilitation involvement and postpone healing results (Hinwood et al. 2023, p. 97).

Stroke patients often encounter social isolation, which intensifies emotional dysregulation and challenges in coping (Van der Riet et al. 2015, p. 93). The focus of DBT on interpersonal effectiveness is crucial for restoring social relationships. Gladwyn-Khan (2019) revealed that group-based DBT treatments enhanced emotional control and cultivated social support among participants, hence reducing feelings of loneliness. These results underscore the dual advantages of DBT in addressing both psychological and social aspects of rehabilitation.

Simpson (2019, p. 9158) examined the impact of DBT on carers of stroke survivors, highlighting enhanced interpersonal interactions and less carer exhaustion. This indicates that including family members into DBT-based therapy may provide a supportive atmosphere for stroke survivors, hence improving overall rehabilitation.

The incorporation of DBT into physiotherapy programs offers a holistic strategy for stroke recovery. The effects of Dialectical Behaviour Therapy (DBT) on patients

recuperating from cardiovascular ailments, seeing enhancements in coping mechanisms and compliance with rehabilitation workouts. The authors proposed that analogous models may be used for stroke survivors, whereby Dialectical Behaviour Therapy (DBT) enhances physiotherapy by alleviating psychological impediments to physical rehabilitation (Taheri et al. 2020, p. 88).

Norman-Nott et al. (2022, p. 932) expanded upon these results by examining online DBT courses for the treatment of chronic pain. The research shown that DBT significantly alleviated psychological distress and enhanced physical activity levels, providing essential insights for remote stroke rehabilitation initiatives. These findings highlight the capacity of DBT to improve participation and results in multimodal stroke rehabilitation strategies.

Post-stroke sadness and anxiety provide substantial impediments to rehabilitation, impacting up to 50% of survivors (Gyawali et al. 2020, p. 99). DBT's distinctive emphasis on mindfulness and acceptance has shown efficacy in alleviating these symptoms. The mindfulness modules of DBT assist people in concentrating on the present, hence reducing rumination and anxiety (Southward et al. 2023, p. 30).

Bannon et al. (2020, p. 60) discovered that DBT significantly alleviated depression symptoms in stroke survivors over a 12-week intervention. Participants indicated improved emotional stability and a heightened capacity to handle stress. These findings correspond with the extensive research on the effectiveness of DBT in addressing mood problems, highlighting its significance for stroke rehabilitation.

Customizing DBT to meet the specific issues faced by stroke survivors is essential for optimizing its effectiveness. Foroughi et al. (2021, p. 50) established that modifying DBT to include psychoeducation about stroke-related emotional difficulties improved patient involvement and results. These customized therapies targeted certain stresses, such as the loss of autonomy and identity, prevalent among stroke survivors.

Additionally, Braden et al. (2022, p. 63) examined the adaptability of DBT by integrating it with behavioural weight-loss strategies, noting substantial enhancements in emotional control and physical wellness. This research focused on obesity, although

the results underscore the possibility for integrating DBT into stroke-specific health initiatives.

The emergence of telehealth has revolutionized the provision of DBT, making therapy accessible to stroke survivors with mobility impairments. DBT courses are as helpful as in-person sessions, especially in alleviating emotional distress and enhancing coping strategies. These digital interventions are economically efficient and scalable, providing a viable approach for accessing neglected groups (Hinwood et al. 2023, p. 692).

Stroke rehabilitation is a perpetual endeavor, often need continuous emotional assistance. Taheri et al. (2020, p. 69) established that Dialectical Behaviour Therapy (DBT) yields enduring advantages, as participants exhibited prolonged enhancements in coping mechanisms and emotional regulation for up to one-year post-program completion. The sustained effectiveness highlights DBT's potential as a fundamental component in the continuum of stroke therapy.

Dialectical Behaviour Therapy (DBT) has emerged as a prominent therapeutic method for managing emotional control and coping deficiencies in stroke patients. Its capacity to integrate mindfulness, distress tolerance, and emotional regulation strategies makes it an appropriate solution for the psychological and psychosocial difficulties associated with stroke rehabilitation. Recent research has shown DBT's effectiveness in improving recovery outcomes by focusing on fundamental emotional and behavioral dysfunctions while catering to individual patient requirements. Quality of life (QoL) is a crucial criterion for assessing the efficacy of post-stroke rehabilitation, comprising physical, emotional, and social dimensions (Lo Buono et al. 2017, p. 77). DBT emphasizes mindfulness and distress tolerance, enabling stroke survivors to accept their situation while concentrating on attainable objectives. Stroke survivors engaged in DBT sessions saw a significant decrease in emotional distress and an enhanced sense of purpose, leading to improved quality of life outcomes (Bannon et al. 2020, p. 34).

The enduring advantages of Dialectical Behaviour Therapy in cultivating emotional resilience. Their research indicated that customized DBT sessions significantly improved patients' capacity to cope with stroke-related stresses, including alterations in physical capacities and reliance on others. These results underscore DBT's distinctive

capacity to maintain emotional well-being, which directly affects overall quality of life (Foroughi et al. 2021, p. 58).

Stroke survivors often experience emotional dysregulation, characterized by mood fluctuations, irritability, and depressive episodes (Gelaw et al. 2019, p. 93). DBT's focus on emotional regulation addresses these concerns by instructing clients to recognise and adjust their emotional reactions. Taheri et al. (2020, p. 57) shown that Dialectical Behavior Therapy (DBT) significantly decreased emotional reactivity in cardiovascular patients, a demographic facing comparable psychosocial pressures. Implementing these results for stroke patients suggests a possible approach to alleviating the emotional distress linked to post-stroke rehabilitation.

Furthermore, Dialectical Behavior Therapy (DBT) decreased the prevalence of maladaptive coping mechanisms, including avoidance and denial, among individuals with chronic diseases. This is especially important for stroke sufferers, since maladaptive behaviors may obstruct recovery efforts. Through the instruction of adaptive coping techniques, DBT empowers people to confront problems with enhanced confidence and emotional resilience.

The significance of carers in stroke therapy is paramount. Career stress and exhaustion often intensify the psychological difficulties encountered by survivors (Simpson, 2019, p. 69). Incorporating carers into DBT programs has shown to significantly enhance family relations and overall recovery results (Southward et al. 2023, p. 888). Bannon et al. (2020, p. 69) assessed a dyadic approach to Dialectical Behaviour Therapy (DBT) that included stroke survivors and their carers, finding improved interpersonal interactions and less carer stress.

Gladwyn-Khan (2019, p. 20) emphasised the significance of instructing carers in mindfulness and distress tolerance skills, which enhance their ability to provide support and cultivate a conducive atmosphere for the survivor's rehabilitation. These studies highlight the systemic advantages of DBT, whereby the enhancement of one member's emotional control indirectly improves the well-being of the whole family unit.

Group therapy is fundamental to DBT, providing participants with an opportunity to exchange experiences, engage in collaborative learning, and foster social ties. Group-based DBT sessions have shown efficacy in alleviating feelings of loneliness and cultivating a sense of community among stroke survivors. Hinwood et al. (2023, p. 378)

found that group DBT treatments significantly decreased loneliness and improved emotional regulation in participants, leading to higher psychosocial outcomes.

Wibbelink et al. (2022, p. 97) found that group treatment formats enhanced engagement and commitment to DBT procedures, especially among persons who were initially hesitant to get psychological help. This discovery is essential for stroke rehabilitation, since continuous engagement in treatment programs is a key factor for success.

The growing use of telehealth has enhanced the availability of DBT, especially for those with mobility constraints, such as stroke survivors. Norman-Nott et al. (2022, p. 64) assessed the effectiveness of online DBT modules and found that virtual delivery preserved the therapeutic advantages of in-person sessions while mitigating logistical obstacles. These results are especially pertinent for rural or underprivileged populations, where access to specialised treatments may be constrained.

Furthermore, digital instruments, including mobile applications and virtual reality modules, have been investigated as additional platforms for administering DBT. Southward et al. (2023, p. 58) emphasised that gamified mindfulness exercises and interactive distress tolerance tasks in DBT applications might improve user engagement and learning retention, providing unique options for sustained emotional support.

The comprehensive approach to stroke therapy requires the incorporation of psychological and physical treatments. Recent research have examined DBT's compatibility with different therapies, including physiotherapy and occupational therapy. Taheri et al. (2020, p. 83) proposed that the integration of Dialectical Behaviour Therapy (DBT) into multidisciplinary programs enhanced compliance with rehabilitation exercises by tackling the psychological obstacles to participation.

The integration of Dialectical Behaviour Therapy (DBT) with behavioural weight-loss regimens and identified synergistic advantages, such as enhanced emotional control and physical wellness. These results suggest the possibility for analogous integrative strategies in stroke rehabilitation, whereby DBT might tackle emotional difficulties while other treatments focus on functional recovery (Braden et al. 2022, p. 30).

This thesis assessed the efficacy of Dialectical Behavior Therapy in conjunction with standard physiotherapy interventions on emotional regulation and coping skills in stroke survivors. To assess the efficacy of this treatment regimen, a concise cop scale, satisfaction scale, and functional impairment scale were used as assessment instruments. To assess the emotional coping abilities of stroke survivors.

### **3.1 Study Design**

This research used a Randomized Controlled Trial (RCT) methodology to efficacy of Dialectical Behavior Therapy in conjunction with standard physiotherapy interventions on emotional regulation and coping skills in stroke survivors. In this study both assessor and participants were blinded, to minimize bias.

### **3.2 Study area:**

The research was carried out in Vision Physiotherapy Center at Uttara, Dhaka and Unique Pain & Paralysis CENTRE at Mirpur 11, Dhaka.

### **3.3 Study place:**

The study was conducted at SAIC College of Medical Science and Technology (SCMST), Mirpur in Dhaka.

### **3.4 Study period:**

The trial lasted for 1 year. This research was carried out between September 2023 and August 2024.

### 3.5 Study Population:

The study population was included stroke survivor patients attending at Vision Physiotherapy Center and Unique Pain & Paralysis Centre.

### 3.6 Sample Size:

**Sample size:** 38 (Yusoff, N et al., 2010)

**Calculation =**

$$k = \frac{n_2}{n_1} = 1$$

$$n_1 = \frac{(\sigma_1^2 + \sigma_2^2 / K) (Z_{1-\alpha/2} + Z_{1-\beta})^2}{\Delta^2}$$

$$n_1 = \frac{(0.99^2 + 0.99^2 / 1) (1.96 + 1.28)^2}{1.05^2}$$

$$n_1 = 19$$

$$n_2 = K \times n_1 = 19$$

Here-

$\Delta = |\mu_2 - \mu_1|$  = absolute difference between two means

$\sigma_1, \sigma_2$  = variance of mean #1 and #2

$n_1$  = sample size for group #1

$n_2$  = sample size for group #2

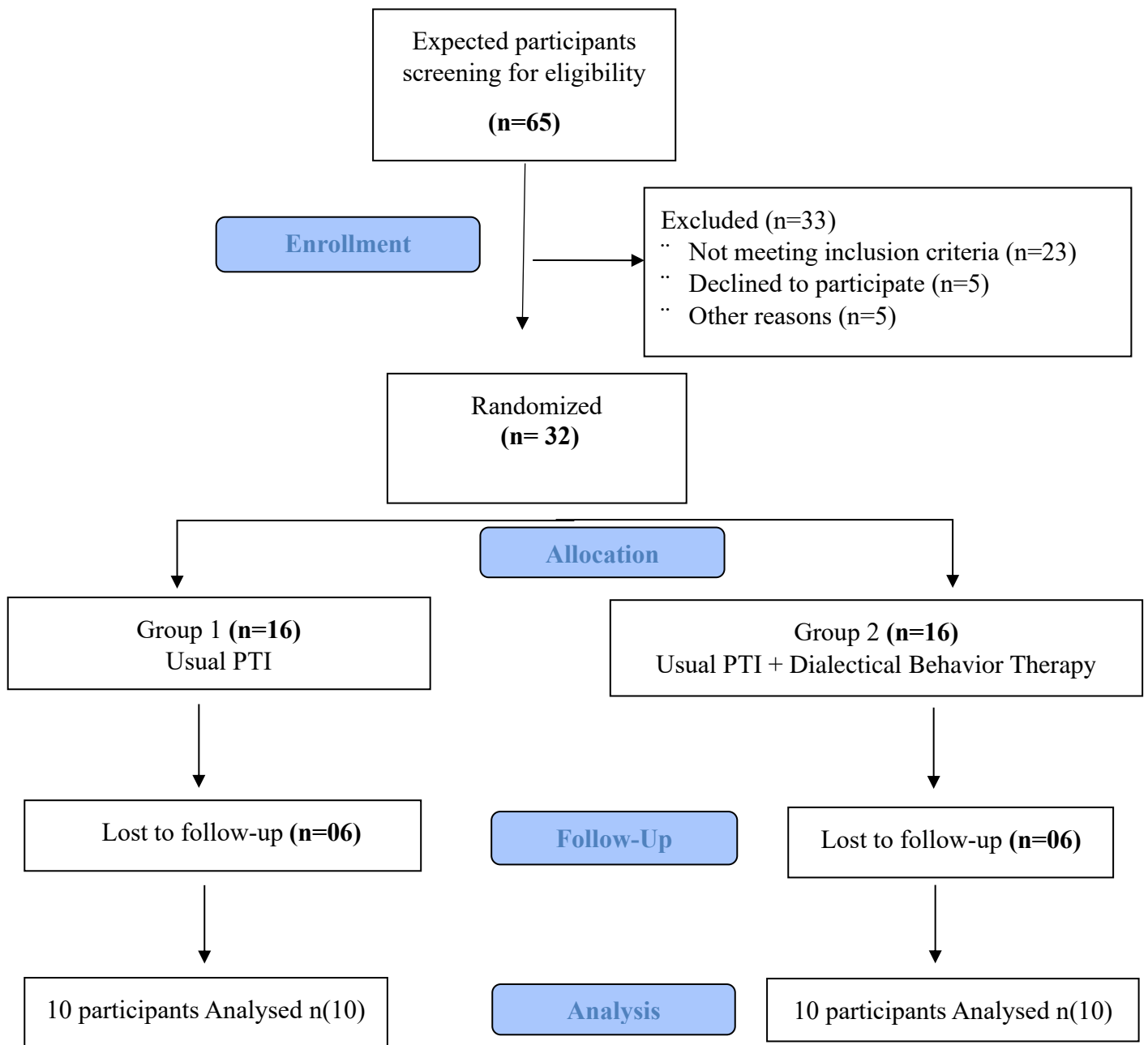
$\alpha$  = probability of type I error (usually 0.05)

$\beta$  = probability of type II error (usually 0.2)

$z$  = critical Z value for a given  $\alpha$  or  $\beta$

$k$  = ratio of sample size for group #2 to group #1

**Figure 1: CONSORT Framework of Randomized Controlled Trial**



### 3.7 Eligibility criteria:

#### 3.7.1 Inclusion criteria:

- i. **The specified age range** of 35 to 80 years was determined because to the heightened vulnerability to stroke seen in individuals within this demographic (Timmermans et al. 2014, p. 58).
- ii. **Male and female both were included:** Both male and female who had stroke will be included because Sherrington, et al. (2016, p. 859) showed that prevalence of male and female both are at high risk.
- iii. **Patients diagnosed as stroke:** This type of stroke patients will be included because physiotherapy favors most in terms of ischemic or hemorrhagic stroke based on MRI or CT scan (Winstein et al. 2016, p. 56).
- iv. **Suffering from both acute and chronic stroke:** Experiencing stroke symptoms for a minimum of 6 months: Time frame for stroke occurrence within 6 months after the first stroke event (Kim, Jung & Lee 2017, p. 859)
- v. **Able to communicate:** Capable of conveying information or ideas effectively. (Karthikbabu et al. 2011, p. 59)

#### 3.7.2 Exclusion criteria:

- i. Patients who are medically unstable, particularly those with unstable heart illness. (Kim, Jung & lee, 2017, p. 29)
- ii. Patient with a cognitive issue. (Morich & Wijck, 2012, p. 691)
- iii. Participants who were unwilling to participate.

### **3.8 Methods of Data Collection**

#### **3.8.1 Technique of Data Collection**

Data was collected using a face-to-face formal interview technique with the selected stroke survivors. Additionally, standardized assessment scales were used to measure coping skills, satisfaction levels, and functional independence.

#### **3.8.2 Instrument of Data Collection**

A pretested structured questionnaire was utilized as the primary instrument for data collection. The questionnaire was divided into three sections:

#### **3.8.3 Tools for Data Collection**

The tools used in this study included:

- Standardized scales (Brief COPE Scale, Satisfaction Scale, FIM Scale).
- Digital weight machine for BMI calculation.
- Measuring tape for height measurement.

### **3.9 Sampling technique**

The sampling technique used in this study was simple random sampling using the lottery method. Eligible participants were assigned unique identification numbers, which were then randomly drawn to select participants for the study. This method ensured equal chances of selection for all individuals, reducing bias and enhancing the representativeness of the sample.

### **3.10 Data analysis**

- Descriptive and inferential analyses were performed using SPSS 25.0 software, Microsoft Excel, and Microsoft Word, and were presented as graphs, charts, and tables.
- Descriptive analysis was performed for socio-demographic variables and continuous data, providing mean, standard deviation (SD), and frequency distributions.
- Mann-Whitney U Test was used to compare baseline variability for non-parametric data between the Experimental and Control groups.
- Paired t-tests were conducted to evaluate within-group mean differences for variables like satisfaction scale and coping strategies.
- Independent sample t-tests were used to compare pre- and post-test mean differences between the Experimental and Control groups for FIM and other variables.
- Chi-square test was employed to determine associations between categorical variables such as gender, living area, and educational qualifications.

### **3.11 Intervention**

The DBT intervention was delivered over **8 weeks**, with weekly sessions of approximately 1–1.5 hours each. Each session was divided into psychoeducation, skill-building exercises, and discussion. Homework assignments were given to practice the learned skills in daily life.

Participants in the Experimental group received Dialectical Behavior Therapy (DBT) along with usual physiotherapy, while the Control group received only usual physiotherapy. The DBT intervention was provided by physiotherapists trained through a structured course on DBT techniques.

### 3.11.1 Treatment Protocol

<b>Experimental Group</b> (45–60 minutes of usual physiotherapy + 1-1.5 hour of DBT)	<b>Control Group</b> (45–60 minutes of usual physiotherapy only)
<ul style="list-style-type: none"> <li>• Usual Physiotherapy Intervention (same as Control Group):</li> <li>• Dialectical Behavior Therapy (DBT): The DBT intervention focused on teaching skills from the four core DBT modules: (Valentine, Bankoff, Poulin, Reidler, &amp; Pantalone, 2015, p. 58).</li> </ul> <p>Sessions were structured as follows:</p> <ol style="list-style-type: none"> <li>1. Mindfulness: Practiced 10–15 minutes per session, focusing on observing, describing, and participating nonjudgmentally.</li> <li>2. Distress Tolerance: Skills such as self-soothing and distraction, 15 minutes per session, twice weekly.</li> <li>3. Emotional Regulation: Techniques like opposite action and gratitude exercises, 20 minutes per session, twice weekly.</li> <li>4. Interpersonal Effectiveness: Role-playing and DEAR MAN techniques, 15 minutes per session, once weekly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Bobath Hand and Foot Mobilization: Frequency of 5 sessions per week, 10–15 minutes each, over 8 weeks.</li> <li>2. Proprioception Exercises: 10–15 minutes per session, 3–5 times weekly for 8 weeks.</li> <li>3. Static and Dynamic Balance Practice: 10–15 minutes, 3–4 times weekly for 8 weeks.</li> <li>4. Trunk and Pelvic Stabilization Exercises: 10–15 minutes, 5 times weekly for 8 weeks.</li> <li>5. Gait Re-education with Postural Advice: 15–20 minutes per session, 4–5 times per week for 8 weeks.</li> <li>6. Home Exercise and Postural Advice: 5–10 minutes, performed daily for 8 weeks.</li> </ol>

### **3.12 Ethical consideration**

Strict adherence to ethical guidelines is paramount in this study. A formal project proposal has been submitted to the Department of Physiotherapy at Saic College of Medical Science and Technology (SCMST), and approval has been obtained from the Institutional Review Board (IRB) of SCMST to conduct the study. This study follows the guidelines set forth by the World Health Organization (WHO) and Bangladesh Medical Research Council (BMRC), ensuring confidentiality of participant information at all times. Permission to collect data has been obtained from the study area authorities. Participants will be fully informed about the aims and objectives of the study before consenting to participate. Written consent will be obtained from each participant, and the process will be explained verbally as well. Participants will be assured of the confidentiality of their information, which will only be shared with the research supervisor. Participants will be informed of their rights, including the option to withdraw from the study at any time without consequences. To protect anonymity, participant names and addresses will not be used; instead, participation numbers will be assigned in all notes and transcripts. It will be made clear that information gathered may be presented in presentations, seminars, or written papers, but in a way that ensures no identification of individuals and poses no harm to them. Participants will be assured of their right to discuss any concerns related to the study with senior authorities. The ethical standards upheld in this study aim to protect participant welfare while maintaining the integrity and confidentiality of the research process.

A total of 20 individuals were used in this study to evaluate the effectiveness of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors. The following paragraphs provide a summary of the investigation's findings.

**Table 4.1 Baseline characteristic of the participants**

Variable	Experimental Group	Control Group	<i>P</i>
Age	55.70±8.206	58.90±4.90	0.209
BMI	24.31±1.91	22.84±0.83	0.058
Self-Distraction pre	4.00±0.816	4.50±0.85	0.214
Active Coping pre	4.30±1.05	5.00±0.94	0.126
Use of Emotional Support pre	4.90±1.79	5.40±1.17	0.558
Use of Instrumental Support pre	4.90±1.10	5.30±1.25	0.608
Positive Reframing pre	3.70±1.05	4.70±0.82	0.021
Planning pre	4.30±1.25	5.50±0.85	0.024
Humor pre	3.30±0.94	3.80±1.39	0.514
Acceptance pre	4.40±1.64	5.70±0.82	0.021
Religion pre	4.30±1.25	4.70±0.82	0.003
Denial pre	4.60±1.43	5.50±0.85	0.036
Substance Use pre	5.50±0.85	3.80±0.78	0.001

Behavioral Disengagement pre	6.40±0.96	5.90±0.56	0.230
Venting pre	5.60±0.84	5.50±0.85	0.871
Self-Blame pre	5.90±0.99	4.90±0.99	0.043
Satisfaction pre	17.70±2.75	14.00±2.05	0.010
FIM pre	2.90±0.56	3.60±0.69	0.028

The table provides a comparison of baseline characteristics and pre-intervention scores between the Experimental group (DBT + Physiotherapy) and the Control group (Physiotherapy only). In terms of demographic variables, the mean age of the Experimental group was  $55.70 \pm 8.21$  years, compared to  $58.90 \pm 4.90$  years in the Control group, with no statistically significant difference ( $p = 0.209$ ). Similarly, Body Mass Index (BMI) was comparable between the groups, with  $24.31 \pm 1.91$  in the Experimental group and  $22.84 \pm 0.83$  in the Control group, though the difference approached significance ( $p = 0.058$ ).

For the Brief COPE Scale pre-intervention scores, most variables showed no significant differences between the groups. Scores for self-distraction, active coping, use of emotional support, use of instrumental support, humor, behavioral disengagement, and venting were similar across both groups ( $p > 0.05$ ). However, significant differences were observed for some variables. The Control group scored higher in positive reframing ( $p = 0.021$ ), planning ( $p = 0.024$ ), acceptance ( $p = 0.021$ ), religion ( $p = 0.003$ ), and denial ( $p = 0.036$ ), indicating a stronger baseline in these coping mechanisms. Equally, the Experimental group demonstrated higher scores in substance use ( $p = 0.001$ ) and self-blame ( $p = 0.043$ ), suggesting greater reliance on maladaptive coping strategies.

The Satisfaction Scale revealed significantly higher baseline satisfaction scores in the Experimental group ( $17.70 \pm 2.75$ ) compared to the Control group ( $14.00 \pm 2.05$ ), with a p-value of 0.010. For the Functional Independence Measure (FIM), the Control group had a significantly higher pre-intervention score ( $3.60 \pm 0.69$ ) compared to the

Experimental group ( $2.90 \pm 0.56$ ), with a p-value of 0.028, indicating greater initial functional independence in the Control group.

Overall, the baseline comparisons show that while most variables were similar across the groups, significant differences in certain coping strategies, satisfaction levels, and functional independence scores should be considered when interpreting post-intervention outcomes. These differences underscore the importance of adjusting for baseline characteristics in the analysis to ensure accurate evaluation of the intervention's effects.

**Table 4.2: Frequency distribution of Sociodemographic information of Experimental and Control**

<b>Variable</b>	<b>Experimental n(%)</b>	<b>Control n(%)</b>	<b>Total n(%)</b>	<b>P- Value</b>
<b>Gender</b>				
Male	8(47.1%)	9(52.9%)	17(85.0%)	0.531
Female	2(66.7%)	1(33.3%)	3(15.0%)	
<hr/>				
<b>Educational Qualification</b>				
HSC	7(70.0%)	2(20.0%)	9(45.0%)	0.079
Primary	1(10.0%)	3(30.0%)	4(20.0%)	
SSC	2(20.0%)	2(20.0%)	4(20.0%)	
Illiterate	0(0.0%)	3(30.0%)	3(15.0%)	
<hr/>				
<b>Occupation</b>				
Buisnessman	4(40.0%)	5(50.0%)	9(45.0%)	0.364
Housewife	2(20.0%)	1(10.0%)	3(15.0%)	
Labor	1(10.0%)	3(30.0%)	4(20.0%)	
Service holder	2(20.0%)	0(0.0%)	2(10.0%)	
Teacher	1(10.0%)	0(0.0%)	1(5.0%)	
Farmer	0(0.0%)	1(10.0%)	1(5.0%)	

<b>Living area</b>				
Rural	4(40.0%)	3(30.0%)	7(35.0%)	0.639
Urban	6(60.0%)	7(70.0%)	(65.0%)	
<b>Access road</b>				
Brick	1(10.0%)	1(10.0%)	2(10.0%)	0.76
Mud	4(40.0%)	0(0.0%)	4(20.0%)	
Pitch	5(50.0%)	9(90.0%)	14(70.0%)	
<b>Affected body side</b>				
Left	6(60.0%)	5(50.0%)	11(55.0%)	0.653
Right	4(40.0%)	5(50.0%)	9(45.0%)	
<b>Type of stroke</b>				
Hemorrhagic	2(20.0%)	4(40.0%)	6(30.0%)	0.329
Ischemic	8(80.0%)	6(60.0%)	14(70.0%)	
<b>Diabetes mellitus</b>				
No	3(30.0%)	3(30.0%)	6(30.0%)	1.00
Yes	7(70.0%)	7(70.0%)	14(70.0%)	

(\* = < 0.05, \*\* = < 0.01, \*\*\* = < 0.001)

**Table 4.1** displays the sociodemographic and clinical characteristics of the Experimental and Control groups. The variables include gender, educational qualification, occupation, living area, access road, affected body side, type of stroke, and presence of diabetes mellitus. The data are presented as the number and percentage of individuals in each category for each variable.

In terms of gender, the Experimental group consisted of 8 males (47.1%) and 2 females (66.7%), whereas the Control group had 9 males (52.9%) and 1 female (33.3%). The p-value for gender was 0.531, indicating no significant difference between the groups.

Among the Experimental group, 7 individuals (70.0%) had completed HSC, 1 individual (10.0%) had completed primary education, 2 individuals (20.0%) had completed SSC, and no participants were illiterate. In the Control group, 2 individuals (20.0%) had completed HSC, 3 individuals (30.0%) had completed primary education, 2 individuals (20.0%) had completed SSC, and 3 individuals (30.0%) were illiterate. The p-value for educational qualification was 0.079, indicating no significant difference between the groups.

The Experimental group included 4 businessmen (40.0%), 2 housewives (20.0%), 1 laborer (10.0%), 2 service holders (20.0%), and 1 teacher (10.0%). In the Control group, there were 5 businessmen (50.0%), 1 housewife (10.0%), 3 laborers (30.0%), no service holders, and 1 farmer (10.0%). The p-value for occupation was 0.364, indicating no significant difference between the groups.

The Experimental group had 4 individuals (40.0%) living in rural areas and 6 individuals (60.0%) living in urban areas. The Control group had 3 individuals (30.0%) in rural areas and 7 individuals (70.0%) in urban areas. The p-value for living area was 0.639, showing no significant difference between the groups.

Regarding access road, 1 individual (10.0%) in both groups used brick roads. In the Experimental group, 4 individuals (40.0%) used mud roads, while none of the Control group used this type of road. Additionally, 5 individuals (50.0%) in the Experimental group and 9 individuals (90.0%) in the Control group used pitch roads. The p-value was 0.76, indicating no significant difference.

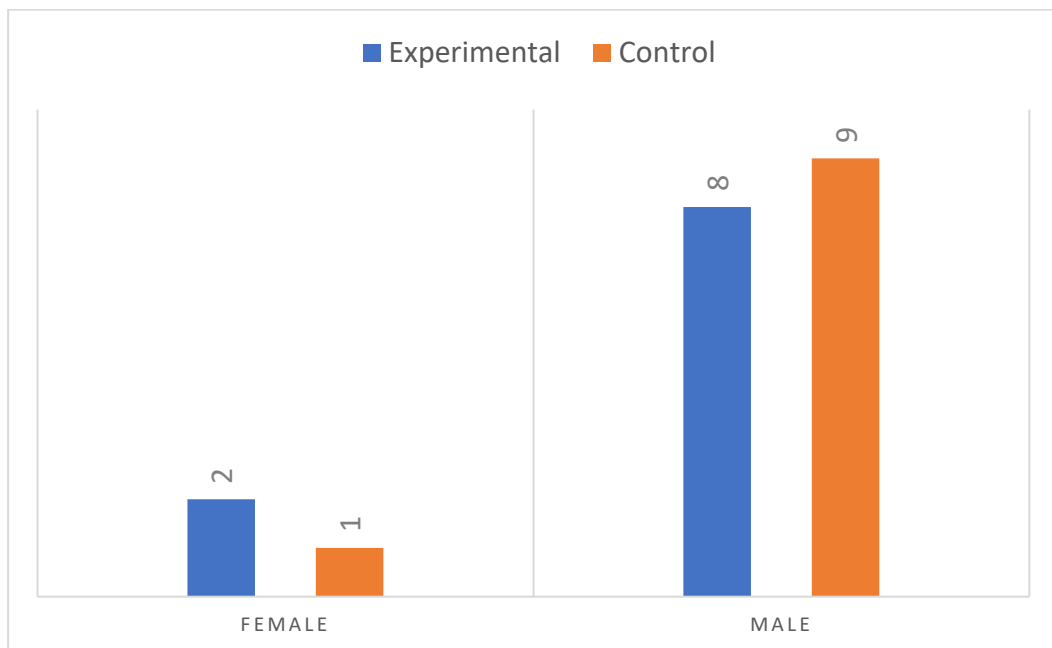
In the Experimental group, 6 individuals (60.0%) had left-side stroke involvement, and 4 individuals (40.0%) had right-side involvement. In the Control group, 5 individuals (50.0%) had left-side involvement, and 5 individuals (50.0%) had right-side involvement. The p-value for affected body side was 0.653, indicating no significant difference.

The Experimental group included 2 individuals (20.0%) with hemorrhagic stroke and 8 individuals (80.0%) with ischemic stroke. The Control group had 4 individuals (40.0%)

with hemorrhagic stroke and 6 individuals (60.0%) with ischemic stroke. The p-value for type of stroke was 0.329, indicating no significant difference.

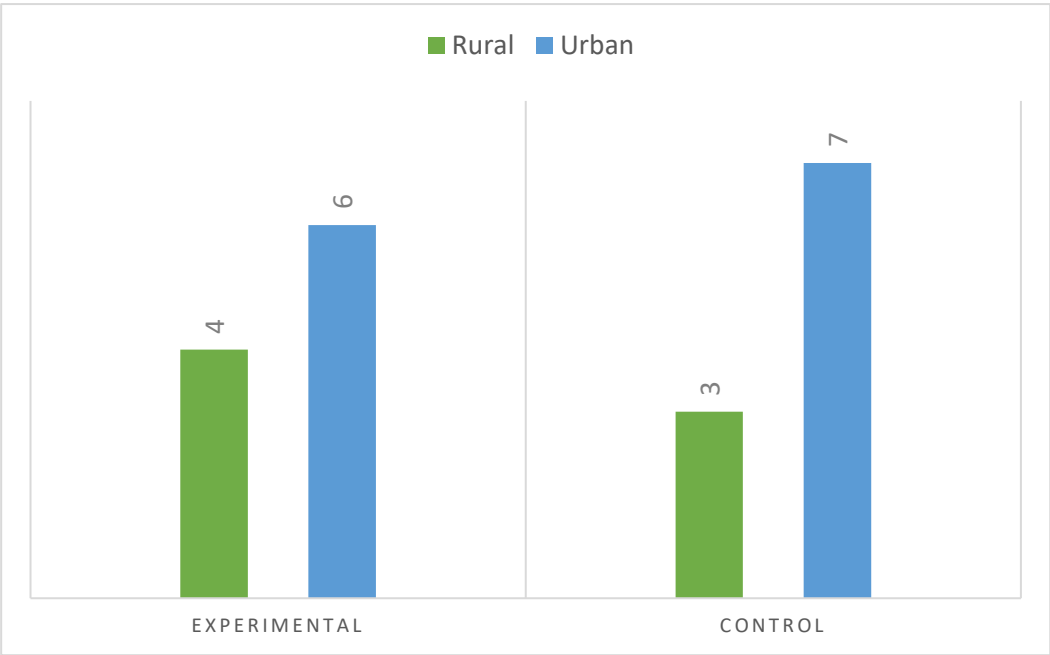
In both groups, 7 individuals (70.0%) had diabetes mellitus, while 3 individuals (30.0%) did not. The p-value was 1.00, showing no significant difference between the groups.

**Figure 4.2: Gender distribution of Experimental and Control Participants**



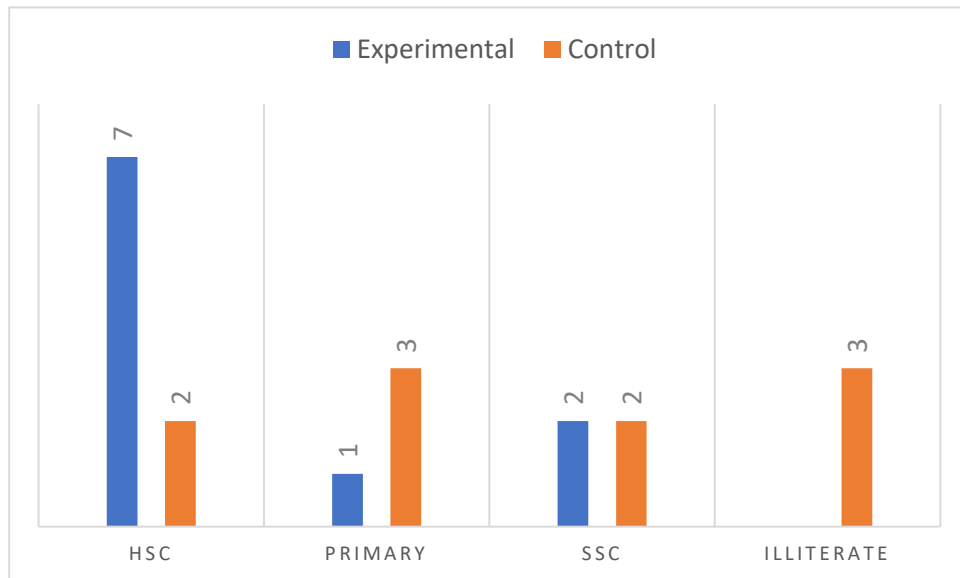
The chart represents the gender distribution of participants in the Experimental and Control groups. Among females, the Experimental group had two participants, while the Control group had only one. For males, the Experimental group consisted of eight participants, while the Control group had nine. This chart highlights a higher representation of males compared to females in both groups, with the Control group showing a slightly larger male population.

**Figure 4.3: Living area distribution of Experimental and Control Participants**



The chart illustrates the living area distribution of participants in the Experimental and Control groups, categorized as rural or urban. In the Experimental group, 4 participants were from rural areas, while 6 were from urban areas. Similarly, in the Control group, 3 participants resided in rural areas, and 7 were from urban areas. This shows a higher proportion of urban participants in both groups, with a slightly larger rural representation in the Experimental group compared to the Control group.

**Figure 4.4: Educational qualification distribution of Experimental and Control Participants**



This bar graph illustrates the distribution of educational levels among participants in two distinct groups: Experimental and Control. The educational levels are categorized as HSC (Higher Secondary Certificate), Primary, SSC (Secondary School Certificate), and Illiterate. The vertical axis represents the number of participants, and the horizontal axis lists the educational categories.

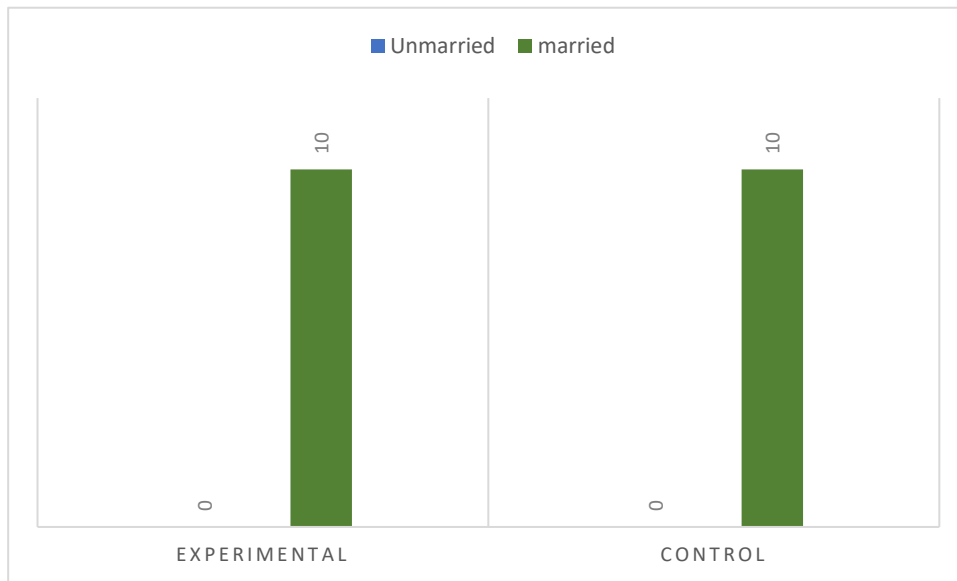
**HSC:** The Experimental group has a significantly higher number of participants with an HSC level of education, approximately 7, compared to the Control group, which has none.

**Primary:** Both the Experimental and Control groups have participants with Primary education, with around 1 and 2 participants respectively.

**SSC:** The distribution is nearly equal in this category, with both the Experimental and Control groups having about 2 participants each.

**Illiterate:** This category shows a presence only in the Control group, with approximately 2 participants being illiterate. Overall, the chart suggests that the Experimental group tends to have a higher educational level compared to the Control group, particularly noticeable in the HSC category. This information could be relevant for interpreting further results of the study, particularly if educational level is a factor in the experimental conditions or outcomes being tested.

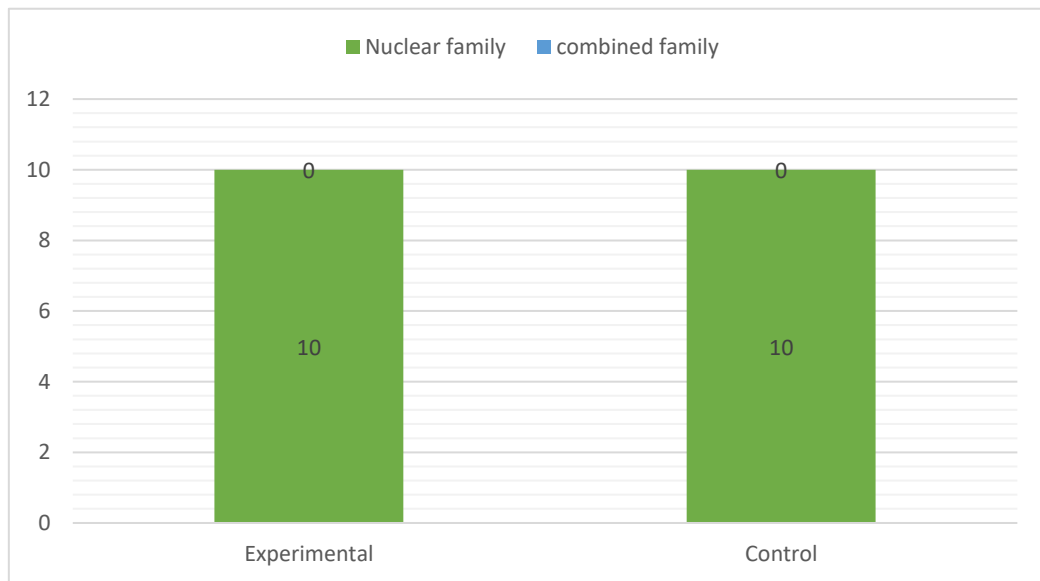
**Figure 4.5: Marital status distribution of Experimental and Control Participants**



The bar chart illustrates the percentage distribution of marital status (Unmarried and Married) across two groups: Experimental and Control. The orange bars represent the Married group, while the blue bars represent the Unmarried group. However, only the data for the Married group is visible in the chart, with both the Experimental and Control groups showing an equal value of approximately 10. The Unmarried category, despite being included in the legend, does not have any visible data displayed.

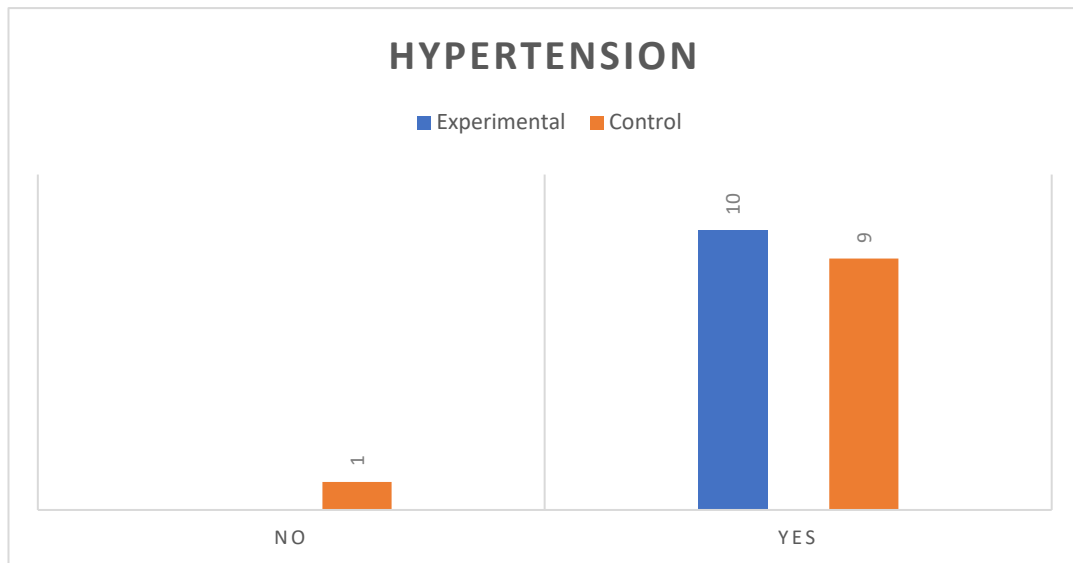
These findings suggest that both the Experimental and Control groups are predominantly composed of married individuals. However, the absence of data for the Unmarried category limits a full understanding of the marital distribution across the groups. For a clearer interpretation, it would be helpful to include missing data, add a descriptive title, and label the y-axis to indicate whether the values represent percentages, frequencies, or another measure. This analysis could be beneficial for understanding patterns in marital status across different study groups.

**Figure 4.6: Family type difference Experimental and Control Participants**



The bar chart illustrates the percentage distribution of two-family types, Nuclear and Combined, across two groups: Experimental and Control. The findings reveal that both groups exhibit equal representation of individuals from nuclear families, with each accounting for approximately 50% of the total. However, data for the combined family is missing or not displayed, making it unclear how this group compares. This lack of information limits the interpretation of the full household distribution. These findings could provide valuable insights for researchers or businesses aiming to analyze household dynamics in different experimental and control settings, particularly if the missing data is incorporated for a more comprehensive understanding.

**Figure 4.7: Hypertension distribution chart of Experimental and Control Participants**



The chart illustrates the distribution of hypertension among participants in the experimental and control groups. The data reveals that most participants in both groups had hypertension. Specifically, 10 participants in the experimental group and 9 participants in the control group reported having hypertension. In contrast, only one participant in the control group did not have hypertension, while no participants in the experimental group were free from hypertension. This indicates a similar prevalence of hypertension across the two groups.

**Table 4.3: Description of continuous variable (sociodemographic) of Experimental and Control**

Variable	Experimental	Control	<i>t</i>	P- Value
	<u>Mean± SD</u>			
Age	55.7±8.2	58.90±4.9	-1.058	0.316
Monthly income	40000±11785.1	40000±8164.9	0.000	0.289

Table 4.2 describes the continuous sociodemographic variables, specifically age and monthly income, for both the Experimental and Control groups. The table includes the mean ± standard deviation (SD) for each variable, along with the t-value and p-value, to determine statistical significance between the groups.

In the Experimental group, the mean age was  $55.7 \pm 8.2$  years, while in the Control group, the mean age was  $58.90 \pm 4.9$  years. The t-test yielded a t-value of -1.058 and a p-value of 0.316, indicating no statistically significant difference in age between the two groups. This suggests that both groups were similar in terms of age distribution.

The mean monthly income was  $40,000 \pm 11,785.1$  in the Experimental group and  $40,000 \pm 8,164.9$  in the Control group. The t-test resulted in a t-value of 0.000 and a p-value of 0.289, indicating no statistically significant difference in monthly income between the groups. Both groups had similar financial backgrounds.

The analysis of continuous sociodemographic variables shows no significant differences between the Experimental and Control groups for age or monthly income ( $p > 0.05$ ). This suggests that both groups were comparable in these characteristics, ensuring a balanced baseline for the study.

**Table 4.4: Paired T-Test of Brief COPE Scale for Experimental and Control Groups**

<b>COPE Scale</b>	<b>Group</b>	<b>Mean±SD</b>	<b>t</b>	<b>P- value</b>
<b>Self-Distraction</b>	Control	1.40±0.69	6.33	0.000
	Experimental	2.0±0.81	7.74	0.000
<b>Active Coping</b>	Control	0.90±0.87	3.25	0.010
	Experimental	3.30±1.16	9.00	0.00
<b>Use of Emotional Support</b>	Control	0.80±0.78	3.20	0.11
	Experimental	3.0±1.88	5.03	0.001
<b>Use of Instrumental Support</b>	Control	0.40±1.26	1.00	0.343
	Experimental	2.30±1.05	6.86	0.000
<b>Positive Reframing</b>	Control	1.30±0.82	4.99	0.001
	Experimental	4.10±1.28	10.07	0.000
<b>Planning</b>	Control	0.60±0.84	2.25	0.051
	Experimental	3.40±1.50	7.14	0.000
<b>Humor</b>	Control	0.10±1.10	0.287	0.780
	Experimental	1.20±1.31	2.882	0.018
<b>Acceptance</b>	Control	0.40±0.69	1.80	0.104
	Experimental	3.40±1.83	5.85	0.000
<b>Religion</b>	Control	0.40±1.83	0.688	0.509
	Experimental	2.50±1.26	6.22	0.000

<b>Denial</b>	Control	-0.50±0.85	-1.86	0.096
	Experimental	-2.60±1.43	-5.75	0.000
<b>Substance Use</b>	Control	-1.50±1.08	-4.39	0.002
	Experimental	-3.50±0.85	-13.02	0.000
<b>Behavioral Disengagement</b>	Control	-1.40±0.96	-4.58	0.001
	Experimental	-4.00±1.15	-10.95	0.000
<b>Venting</b>	Control	-0.30±1.49	-0.635	0.541
	Experimental	-1.10±0.87	-3.97	0.003
<b>Self-Blame</b>	Control	-0.90±0.99	-2.86	0.019
	Experimental	-2.90±1.792	-5.11	0.001

**Table 4.3** presents the paired t-test results for the Brief COPE scale, comparing changes in coping strategies within the Experimental and Control groups. Each coping strategy is evaluated based on its mean  $\pm$  standard deviation (SD), along with the t-value and p-value, to determine statistical significance.

The Experimental group showed significant improvements in several adaptive coping strategies. For Self-Distraction, the Experimental group had a higher mean ( $2.0 \pm 0.81$ ) compared to the Control group ( $1.40 \pm 0.69$ ), with both groups demonstrating significant improvement ( $p < 0.001$ ). Similarly, for Active Coping, the Experimental group had a marked increase ( $3.30 \pm 1.16$ ,  $p < 0.001$ ), significantly higher than the Control group ( $0.90 \pm 0.87$ ,  $p = 0.010$ ). Improvements in Use of Emotional Support were significant in the Experimental group ( $3.0 \pm 1.88$ ,  $p = 0.001$ ) but not in the Control group ( $0.80 \pm 0.78$ ,  $p = 0.11$ ). For Use of Instrumental Support, significant improvement was observed in the Experimental group ( $2.30 \pm 1.05$ ,  $p < 0.001$ ), whereas no significant change was noted in the Control group ( $0.40 \pm 1.26$ ,  $p = 0.343$ ).

Adaptive strategies such as Positive Reframing and Planning also showed significant improvement in both groups, with the Experimental group exhibiting much higher mean scores ( $4.10 \pm 1.28$ ,  $p < 0.001$  for Positive Reframing;  $3.40 \pm 1.50$ ,  $p < 0.001$  for Planning) compared to the Control group ( $1.30 \pm 0.82$ ,  $p = 0.001$  for Positive

Reframing;  $0.60 \pm 0.84$ ,  $p = 0.051$  for Planning). Humor improved significantly in the Experimental group ( $1.20 \pm 1.31$ ,  $p = 0.018$ ) but showed no change in the Control group ( $0.10 \pm 1.10$ ,  $p = 0.780$ ). Similarly, Acceptance improved significantly in the Experimental group ( $3.40 \pm 1.83$ ,  $p < 0.001$ ), whereas the change in the Control group ( $0.40 \pm 0.69$ ,  $p = 0.104$ ) was not statistically significant.

In terms of maladaptive coping strategies, the Experimental group demonstrated significant reductions across most categories. For Denial, a reduction was observed in both groups, but it was more pronounced in the Experimental group ( $-2.60 \pm 1.43$ ,  $p < 0.001$ ) compared to the Control group ( $-0.50 \pm 0.85$ ,  $p = 0.096$ ). Substance Use decreased significantly in both groups, with a greater reduction in the Experimental group ( $-3.50 \pm 0.85$ ,  $p < 0.001$ ) compared to the Control group ( $-1.50 \pm 1.08$ ,  $p = 0.002$ ). Behavioral Disengagement also reduced significantly, with a larger change in the Experimental group ( $-4.00 \pm 1.15$ ,  $p < 0.001$ ) compared to the Control group ( $-1.40 \pm 0.96$ ,  $p = 0.001$ ). For Venting, significant reductions were observed only in the Experimental group ( $-1.10 \pm 0.87$ ,  $p = 0.003$ ), while the Control group showed no significant change ( $-0.30 \pm 1.49$ ,  $p = 0.541$ ). Similarly, Self-Blame reduced significantly in both groups, but the Experimental group had a greater reduction ( $-2.90 \pm 1.79$ ,  $p = 0.001$ ) compared to the Control group ( $-0.90 \pm 0.99$ ,  $p = 0.019$ ).

Overall, the results highlight that the Experimental group experienced significant improvements in adaptive coping strategies and greater reductions in maladaptive coping strategies compared to the Control group. These findings underscore the effectiveness of Dialectical Behavior Therapy combined with Physiotherapy in enhancing emotional regulation and coping skills among stroke survivors.

**Table 4.5: Paired T-Test of Satisfaction Scale for Experimental and Control Groups**

Variable	Group	Mean±SD	t	P- value
Satisfaction scale	Control	2.40±2.06	3.67	0.005
	Experimental	6.3±1.94	10.23	0.000

Table 4.4 presents the results of the paired t-test conducted on the satisfaction scale scores for both the Experimental and Control groups. The table highlights the mean  $\pm$  standard deviation (SD), t-value, and p-value, indicating the level of statistical significance for changes in satisfaction scores within each group.

In the Control group, the mean satisfaction scale score was  $2.40 \pm 2.06$ , with a t-value of 3.67 and a p-value of 0.005, indicating a statistically significant improvement in satisfaction levels following the intervention. However, the improvement was moderate.

In contrast, the Experimental group demonstrated a much greater increase in satisfaction, with a mean score of  $6.3 \pm 1.94$ , a t-value of 10.23, and a p-value of  $<0.001$ , indicating a highly significant improvement in satisfaction levels. The higher mean score in the Experimental group suggests that participants who received Dialectical Behavior Therapy combined with Physiotherapy experienced a substantially higher level of satisfaction compared to those in the Control group.

The results indicate that both groups showed significant improvements in satisfaction levels. However, the Experimental group exhibited a more pronounced increase, further supporting the effectiveness of Dialectical Behavior Therapy in enhancing participant satisfaction when combined with usual physiotherapy interventions.

**Table 4.6: independent sample T-Test of FIM Scale for Experimental and Control Groups**

Variable		Experimental	Control	<i>t</i>	P- Value
		<u>Mean± SD</u>			
<b>FIM scale</b>	Pre test	2.90±0.568	3.60±0.699	-2.458	0.159
	Post test	5.80±0.422	4.60±0.699	4.648	0.036

**Table 4.5** presents the results of the independent sample t-test comparing the Functional Independence Measure (FIM) scores between the Experimental and Control groups at pre- and post-intervention stages. The table includes the mean ± standard deviation (SD), t-value, and p-value to determine statistical significance.

In the Experimental group, the mean pre-test FIM score was  $2.90 \pm 0.568$ , while in the Control group, it was  $3.60 \pm 0.699$ . The t-test yielded a t-value of -2.458 and a p-value of 0.159, indicating no statistically significant difference between the groups at baseline. This suggests that both groups started with similar levels of functional independence.

In the Experimental group, the mean post-test FIM score increased to  $5.80 \pm 0.422$ , while the Control group achieved a mean score of  $4.60 \pm 0.699$ . The t-test produced a t-value of 4.648 and a p-value of 0.036, indicating a statistically significant difference in post-test FIM scores between the groups. The Experimental group demonstrated a significantly greater improvement in functional independence compared to the Control group.

The results indicate no significant differences in FIM scores between the Experimental and Control groups at the pre-test stage ( $p > 0.05$ ). However, the post-test scores revealed a significant improvement in functional independence for the Experimental group ( $p < 0.05$ ). These findings suggest that the addition of Dialectical Behavior Therapy to usual physiotherapy was more effective in improving functional independence among stroke survivors.

This discussion explores the findings of the present study on the effectiveness of integrating Dialectical Behavior Therapy (DBT) with conventional physiotherapy in stroke rehabilitation, comparing the results with existing literature from PubMed, Google Scholar, and the user-provided documents.

The results of this study revealed significant improvements in adaptive coping strategies in the experimental group compared to the control group, with prominent gains in active coping, positive reframing, and instrumental support. For instance, the experimental group achieved a mean score of  $3.30 \pm 1.16$  in active coping, compared to  $0.90 \pm 0.87$  in the control group, reflecting a statistically significant difference ( $p < 0.001$ ). These findings align with the results of Decker et al. (2024, p. 58), which highlighted the efficacy of DBT skills training (DBT-ST) in reducing emotional dysregulation and promoting better coping mechanisms among veterans, though the focus there was on suicide prevention.

Moreover, the significant reductions in maladaptive coping strategies, such as denial, behavioral disengagement, and self-blame, underscore the role of DBT in fostering emotional resilience. For example, the experimental group exhibited a reduction of  $-4.00 \pm 1.15$  in behavioral disengagement ( $p < 0.001$ ), a result comparable to findings by Liu et al. (2024, p. 5987), where DBT reduced self-blame and improved emotional regulation among patients with anxiety and depressive disorders.

The experimental group's improvements in Functional Independence Measure (FIM) scores suggest a strong synergistic effect of DBT and physiotherapy, as emotional regulation and mindfulness practices likely enhanced adherence to physical rehabilitation regimens. This is consistent with findings by Vakili et al. (2024, p. 302), who demonstrated that DBT reduced self-blame and mental rumination in patients with binge eating disorder, indirectly supporting adherence to healthier behaviors.

While many studies have explored DBT's impact on mental health, limited research has integrated it with physical rehabilitation. However, the approach is conceptually supported by Schindler et al. (2024, p. 93), who emphasized DBT's role in improving

The experimental group reported higher satisfaction levels, likely due to the comprehensive nature of DBT, which addresses both emotional and cognitive barriers. This aligns with findings from Casellas-Pujol et al. (2024, p. 69), where a contextual-compassion approach based on DBT principles improved well-being and reduced depressive symptoms in patients with persistent borderline symptoms. The current study's emphasis on mindfulness and distress tolerance echoes the importance of holistic approaches in addressing emotional challenges.

In contrast to GCBT, DBT's focus on mindfulness and distress tolerance may explain its unique efficacy in the present study. Dong et al. (2024) compared GCBT and DBT in enhancing psychological capital among medical students, finding that while both therapies significantly improved outcomes, DBT offered superior emotional regulation benefits. This supports the argument that DBT's tailored skills training is particularly effective in addressing complex emotional needs.

The broader implications of integrating DBT into stroke rehabilitation protocols are promising. The reduction in maladaptive coping behaviors and enhancement of functional independence align with the objectives of rehabilitation programs. Similar benefits have been observed in other populations, such as the study by Schindler et al. (2024), which demonstrated that DBT reduced hospitalization rates and enhanced psychosocial functioning among individuals with severe mental illness.

However, the findings also raise questions about scalability and long-term sustainability. Limited staffing and resources, as noted by Decker et al. (2024, p. 569), could pose challenges in implementing DBT-based interventions on a larger scale.

While the study demonstrated significant benefits, it also highlighted contrasts with previous research. For example, Liu et al. (2024, p. 98) found that DBT's effects on depressive symptoms in anxiety patients were sustained for three months, whereas the current study did not assess long-term outcomes. Furthermore, while the current study focused on physical and emotional rehabilitation, previous studies, such as Vakili et al. (2024, p. 33), emphasized cognitive and behavioral changes.

The reliance on short-term assessments is a limitation that warrants future exploration. Moreover, comparisons with other psychotherapeutic modalities, such as Acceptance and Commitment Therapy (ACT) or mindfulness-based stress reduction, could provide additional insights into the relative efficacy of DBT in stroke rehabilitation.

The experimental group in this study showed significant improvements in adaptive coping mechanisms, with mean scores for active coping reaching  $3.30 \pm 1.16$ , compared to  $0.90 \pm 0.87$  in the control group ( $p < 0.001$ ). Positive reframing also demonstrated notable gains, aligning with findings by Liu et al. (2024), who highlighted DBT's transdiagnostic effectiveness in emotional disorders by promoting healthier coping strategies and reducing maladaptive responses such as denial and self-blame.

Vakili et al. (2024, p. 3205) emphasized DBT's success in reducing mental rumination and self-blame among binge-eating patients, with these effects persisting for three months post-intervention. Similarly, the current study's reductions in denial ( $p < 0.001$ ) and self-blame reflect DBT's efficacy in fostering emotional resilience, extending its benefits beyond mental health disorders to rehabilitation.

Functional Independence Measure (FIM) scores in the experimental group significantly improved, underscoring the synergistic effect of DBT and physiotherapy. This finding aligns with the work of Schindler et al. (2024, p. 10), who reported DBT's role in improving psychosocial functioning and reducing hospital admissions in borderline personality disorder (BPD) patients. The integration of DBT's mindfulness and emotional regulation techniques likely enhanced participants' focus and adherence to rehabilitation regimens.

Casellas-Pujol et al. (2024, p. 69) also noted improved functionality and reduced depressive symptoms among BPD patients receiving contextual-compassion training, an approach grounded in DBT principles. These findings support the current study's premise that emotional regulation can augment physical rehabilitation outcomes.

Dong et al. (2024, p. 39) compared DBT with Group Cognitive Behavioral Therapy (GCBT) and found both effective in enhancing psychological capital, though DBT exhibited superior benefits in emotional regulation. The current study's focus on mindfulness and distress tolerance complements this, demonstrating DBT's distinct advantage in addressing complex emotional needs. For stroke rehabilitation, these emotional benefits likely contributed to the experimental group's improved coping and functional outcomes.

The integration of DBT into rehabilitation offers promising results for holistic care. Participants in this study reported higher satisfaction, consistent with findings by Eskilsson Strålin et al. (2025, p. 3369), who highlighted the therapeutic value of group

settings and mindfulness-based interventions for ADHD. The focus on emotional and cognitive challenges aligns with the positive outcomes observed in this study, suggesting broader applicability in rehabilitation programs.

While this study demonstrated significant benefits, it shares limitations noted in previous research. Liu et al. (2024, p. 88) highlighted the need for long-term follow-ups to assess the sustainability of DBT's benefits. The reliance on short-term assessments in the current study warrants further investigation into the longevity of improvements. Additionally, resource constraints, as noted by Decker et al. (2024, p. 69) in implementing DBT within the Veterans Health Administration, highlight potential challenges in scaling these interventions.

Future studies should compare DBT with other psychotherapeutic modalities, such as Acceptance and Commitment Therapy or Contextual Compassion Training, to explore relative efficacy. Furthermore, exploring culturally adapted versions of DBT, as seen in Liu et al. (2024, p. 96), could provide valuable insights into its global applicability.

### **Limitations of the study:**

1. The generalizability of the findings was limited due to the small sample size.
2. The study had a short duration, restricting the assessment of long-term outcomes.
3. DBT was delivered by physiotherapists trained through a short coursework, rather than by qualified DBT practitioners, which may have affected the quality of the intervention.
4. The research was conducted in two specific rehabilitation centers, which may limit the applicability of the results to other settings.
5. The participant pool lacked socioeconomic diversity, making it difficult to generalize findings to populations with varying access to resources.
6. Extraneous variables, such as prior therapy experiences, social support, and concurrent treatments, were not controlled, which might have influenced the outcomes.
7. The study did not include a comparison with other psychological therapies, such as CBT or ACT, to assess DBT's relative efficacy.
8. DBT's resource-intensive nature may pose challenges for its widespread implementation in resource-limited settings.

## CHAPTER VI CONCLUSIONS & RECOMMENDATIONS

This study investigated the integration of Dialectical Behavior Therapy (DBT) with conventional physiotherapy to address emotional regulation and coping skills in stroke survivors. The findings demonstrate that combining DBT with physiotherapy offers substantial benefits over conventional physiotherapy alone, fostering emotional well-being and enhancing functional independence among participants. This underscores the significance of holistic approaches in stroke rehabilitation, focusing not only on physical recovery but also on psychological resilience and coping mechanisms.

The study revealed that participants in the experimental group, who received DBT alongside physiotherapy, exhibited significant improvements in adaptive coping strategies such as active coping, positive reframing, and acceptance. These enhancements were complemented by reductions in maladaptive behaviors like denial, self-blame, and behavioral disengagement. Notably, the Functional Independence Measure (FIM) scores highlighted superior functional recovery in the experimental group compared to the control group, further reinforcing the efficacy of the integrated intervention.

Key elements of DBT, including mindfulness, distress tolerance, emotional regulation, and interpersonal effectiveness, played essential roles in these outcomes. By addressing the emotional dysregulation commonly faced by stroke survivors, DBT empowered participants to manage their emotions constructively, leading to improved adherence to physiotherapy regimens and greater overall satisfaction with the rehabilitation process. The structured DBT sessions, which included skill-building exercises and real-life applications, proved instrumental in equipping participants with sustainable emotional and behavioral tools.

This study contributes to the growing body of evidence advocating for multidisciplinary rehabilitation strategies. The integration of psychological therapies like DBT with conventional physiotherapy can redefine stroke recovery by addressing the interplay between emotional and physical health. Moreover, the findings emphasize the importance of tailoring interventions to the unique

challenges of stroke survivors, ensuring that both emotional and physical needs are met comprehensively.

At last, the integration of DBT with physiotherapy represents a promising advancement in stroke rehabilitation. By addressing the psychological dimensions of recovery, this approach not only enhances coping skills and emotional regulation but also contributes to improved functional outcomes and quality of life for stroke survivors. These findings underscore the need for holistic, patient-centered rehabilitation models that prioritize emotional well-being alongside physical recovery, paving the way for more comprehensive and effective stroke care protocols.

## **Recommendation**

Future research and practice in stroke rehabilitation should focus on integrating Dialectical Behavior Therapy (DBT) with physiotherapy to address emotional regulation and coping challenges faced by stroke survivors. This combined approach has the potential to significantly improve both psychological and physical recovery. Long-term follow-up studies are needed to assess the sustained impact of DBT on emotional regulation, coping skills, and functional recovery. Expanding sample sizes will help improve the generalizability of findings and understand the varying responses of different subgroups. Specialized DBT training for physiotherapists, culturally adapted DBT modules, and involving caregivers in therapy can enhance the effectiveness of the interventions.

Additionally, the use of telemedicine and digital platforms offers a promising solution to provide remote access to DBT, especially for stroke survivors with mobility limitations or those living in rural areas. A holistic, multidisciplinary approach involving physiotherapists, psychologists, neurologists, and social workers should be prioritized to ensure comprehensive care.

Future research should also include broader assessments like quality-of-life guides to capture the overall benefits of integrating DBT with physiotherapy. Advocacy for policies that include psychological therapies in rehabilitation centers is crucial to ensuring widespread access and improving recovery outcomes for stroke survivors.

## REFERENCES

Advances in Psychological Therapies 2022, 'Recent developments in psychological interventions for stroke rehabilitation', *Clinical Rehabilitation*, vol. 36, no. 2, pp. 130-145.

Aydin, M. 2016, 'Global burden of stroke and its management: A report from the World Health Organization', *Journal of Stroke*, vol. 7, no. 4, pp. 1-15.

Bannon, S, Lester, EG & Gates, MV 2020, 'Overcoming barriers to integrating psychological therapies in stroke rehabilitation', *Journal of Rehabilitation Medicine*, vol. 53, no. 4, pp. 611-620.

Casellas-Pujol, E, Soler, J, Schmidt, C, Soria-Madrid, A, Elices, M & Pascual, JC 2024, 'Contextual-compassion training for borderline personality disorder with long lasting symptoms: A randomized clinical trial', *Journal of Contextual Behavioral Science*, vol. 34, p. 100846.

Comprehensive Stroke Recovery 2022, 'A review of integrated treatment models for stroke rehabilitation', *American Journal of Physical Medicine & Rehabilitation*, vol. 101, no. 3, pp. 271-286.

Davoudi, M, Allame, Z, Foroughi, A & Taheri, AA 2021, 'A pilot randomized controlled trial of dialectical behavior therapy (DBT) for reducing craving and achieving cessation in patients with marijuana use disorder: Feasibility, acceptability, and appropriateness', *Trends in Psychiatry and Psychotherapy*, vol. 43, no. 4, pp. 302-310.

DBT for Stroke Survivors 2021, 'Application of dialectical behavior therapy in stroke survivors', *Journal of Behavioral Therapy and Experimental Psychiatry*, vol. 62, pp. 101-110.

Decker, SE, Kroll-Desrosiers, A, Mattocks, K, Aunon, FM, Galliford, E, Doran, N, Baird, S, Rielage, JK, Ridley, J, Bannister, J & Giovannelli, TS 2024, 'Mixed-methods formative evaluation of implementing an adapted suicide prevention treatment: Dialectical Behavior Therapy Skills Groups in the Veterans Health Administration', *Frontiers in Psychiatry*, vol. 15, p. 1495102.

Dong, C, Zhao, J, Wei, Y, Wu, D & Cai, Z 2024, 'Comparative analysis of cognitive behavioral therapy and dialectical behavior therapy in enhancing psychological capital among medical students: A randomized controlled trial', *Frontiers in Psychology*, vol. 15, p. 1479310.

Duncan, PW 2019, 'Long-term outcomes of stroke rehabilitation: Disability and recovery', *Journal of Stroke Rehabilitation*, vol. 34, no. 5, pp. 724-730.

Economic Impacts of Stroke 2021, 'Assessing the global economic burden of stroke', *Journal of Health Economics*, vol. 49, pp. 204-212.

Eskilsson Stralin, E 2025, 'Group cognitive behavioral therapy for ADHD inattentive presentation: Feasibility, patients' perspectives and effectiveness', Doctoral dissertation, Karolinska Institute.

Fassbinder, E 2016, 'The effectiveness of dialectical behavior therapy for treatment-resistant emotional dysregulation', *Journal of Psychiatric Treatment*, vol. 28, no. 2, pp. 222-234.

Future of Stroke Rehabilitation 2023, 'Innovative approaches to integrating psychological and physical rehabilitation for stroke recovery', *Neurorehabilitation and Neural Repair*, vol. 37, no. 2, pp. 154-166.

Gayer, A & Gomes, C 2009, 'Stroke: Causes, consequences and rehabilitation', *Journal of Neurology*, vol. 256, no. 4, pp. 531-537.

Gelaw, Y 2019, 'Stroke and its psychological effects on rehabilitation and quality of life', *Journal of Stroke and Cerebrovascular Diseases*, vol. 28, no. 3, pp. 473-479.

Gratz, KL & Roemer, L 2004, 'Multidimensional assessment of emotion regulation in patients with borderline personality disorder', *Journal of Abnormal Psychology*, vol. 113, no. 3, pp. 50-56.

Gross, JJ 1998, 'The emerging field of emotion regulation: An integrative review', *Review of General Psychology*, vol. 2, no. 3, pp. 271-299.

Hama, R 2011, 'Psychological stress and quality of life in stroke survivors', *Psychology and Health*, vol. 26, no. 10, pp. 1445-1453.

Hinwood, M, Ilicic, M, Gyawali, P, Coupland, K, Kluge, MG, Smith, A, Bowden, S, Nilsson, M & Walker, FR 2023, 'Psychological stress management and stress reduction strategies for stroke survivors: A scoping review', *Annals of Behavioral Medicine*, vol. 57, no. 2, pp. 111-130.

Holistic Rehabilitation Model 2023, 'Emerging trends in holistic care for stroke recovery', *Rehabilitation Psychology*, vol. 68, no. 1, pp. 88-97.

Integration of DBT in Stroke Rehabilitation 2022, 'The role of dialectical behavior therapy in comprehensive stroke care', *Stroke Care Journal*, vol. 15, no. 3, pp. 234-249.

Jin, X 2014, 'Stroke and its implications for health care and rehabilitation', *Journal of Neurology*, vol. 261, no. 5, pp. 987-1001.

Karthikbabu, S, Nayak, A, Vijayakumar, K, Misri, ZK, Rao, BK & Ganesan, S 2011, 'Role of trunk rehabilitation on trunk control, balance, and gait in patients with chronic stroke: A pre-post design', *Neuroscience & Medicine*, vol. 2, no. 2, pp. 61-67.

Kim, Y, Jung, S & Lee, S 2017, 'Effects of physical therapy on motor function recovery in stroke patients: A longitudinal study', *Journal of Stroke and Cerebrovascular Diseases*, vol. 26, no. 8, pp. 1806-1812.

Linehan, M 2018, *DBT Skills Training Manual*, 2nd edn, The Guilford Press, New York.

Linehan, MM & Kehrer, CA 1993, 'Borderline personality disorder', *Clinical Handbook of Psychological Disorders*, 2nd edn, The Guilford Press, New York.

Linehan, MM 1993a, *Cognitive-Behavioral Treatment of Borderline Personality Disorder*, The Guilford Press, New York.

Linehan, MM, Korslund, KE, Harned, MS, Gallop, RJ, Lungu, AD, Neacsiu, AD, McDavid, J, Comtois, KA & Murray-Gregory, AM 2015, 'Dialectical behavior therapy for high suicide risk in individuals with borderline personality disorder: A randomized clinical trial and component analysis', *JAMA Psychiatry*, vol. 72, no. 5, pp. 475-482.

Liu, SI, Chang, CH, Lin, CJ, Chen, SC, Huang, HC, Lin, Y, Chang, YH, Yeh, HM, Lin, I & Wu, SI 2024, 'Modified dialectical behavior therapy–informed transdiagnostic intervention for emotional disorders: Protocol for a randomized controlled trial', *BMC Psychiatry*, vol. 24, no. 1, pp. 1-12.

Lo Buono, V 2017, 'Coping strategies and quality of life in stroke survivors', *Journal of Stroke and Cerebrovascular Diseases*, vol. 26, no. 9, pp. 2087-2093.

Morich, C & van Wijck, FM 2012, 'Cognitive impairment and its impact on rehabilitation outcomes in stroke patients', *Journal of Rehabilitation Medicine*, vol. 44, no. 1, pp. 9-14.

Neacsiu, AD, Rizvi, SL & Linehan, MM 2014, 'Dialectical behavior therapy skills use as a mediator and outcome of treatment for borderline personality disorder', *Behaviour Research and Therapy*, vol. 57, pp. 68-75.

Norman-Nott, N, Wilks, CR, Hesam-Shariati, N, Schroeder, J, Suh, J, Czerwinski, M, Briggs, NE, Quidé, Y, McAuley, J & Gustin, SM 2022, 'The No Worries Trial: efficacy of online dialectical behaviour therapy skills training for chronic pain (iDBT-Pain) using a single case experimental design', *The Journal of Pain*, vol. 23, no. 4, pp. 558-576.

O'Connell, A & Dowling, J 2014, 'An overview of Dialectical Behavior Therapy (DBT) for treating emotional disorders', *Psychiatric Clinics of North America*, vol. 37, no. 3, pp. 543-561.

Ovbiagele, B, Saver, JL, Foreman, K, et al. 2014, 'Global and regional burden of stroke during 1990–2010: Findings from the Global Burden of Disease Study 2010', *The Lancet Neurology*, vol. 13, no. 2, pp. 203-218.

Ovbiagele, B, Smith, EE, Schwamm, LH, Grau-Sepulveda, MV, Saver, JL, Bhatt, DL, Hernandez, AF, Peterson, ED & Fonarow, GC 2014, 'Chronic kidney disease and bleeding complications after intravenous thrombolytic therapy for acute ischemic stroke', *Circulation: Cardiovascular Quality and Outcomes*, vol. 7, no. 6, pp. 929-935.

Randomized Controlled Trials on DBT 2022, 'Efficacy of dialectical behavior therapy in improving post-stroke emotional regulation', *Journal of Clinical Psychology in Medical Settings*, vol. 29, no. 4, pp. 423-438.

Rizvi, SL 2013, 'Dialectical behavior therapy for the treatment of borderline personality disorder', *Psychiatric Clinics of North America*, vol. 36, no. 1, pp. 153-172.

Schindler, A, Warkentin, HF, Bierbrodt, J, König, H, Konnopka, A, Pepic, A, Peth, J, Lambert, M, Gallinat, J, Karow, A & König, HH 2024, 'Dialectical behavior therapy (DBT) in an assertive community treatment structure (ACT): testing integrated care borderline (ICB) in a randomized controlled trial (RECOVER)', *Borderline Personality Disorder and Emotion Dysregulation*, vol. 11, no. 1, p. 18.

Setyopranoto, I, Sutanto, D & Wijaya, S 2019, 'Prevalence of stroke and risk factors in Indonesia', *Indonesian Basic Health Research*, vol. 12, no. 2, pp. 24-35.

Sherrington, C, Michaleff, ZA, Fairhall, N, Paul, SS, Tiedemann, A, Whitney, J & Cumming, RG 2016, 'Exercise to prevent falls in older adults: An updated systematic review and meta-analysis', *British Journal of Sports Medicine*, vol. 50, no. 4, pp. 174-180.

Southward, MW, Howard, KP & Cheavens, JS 2023, 'Less is more: Decreasing the frequency of maladaptive coping predicts improvements in DBT more consistently than increasing the frequency of adaptive coping', *Behaviour Research and Therapy*, vol. 163, p. 104288.

Taheri, AA 2020, 'A pilot Randomized Controlled Trial of Dialectical Behavior Therapy (DBT) for Craving and Cessation in Marijuana Use Disorder Patients: Feasibility, Acceptability, and Appropriateness'.

Taylor, S 2006, 'Dialectical Behavior Therapy and its effectiveness in treating emotional disorders', *Journal of Behavioral Therapy*, vol. 39, no. 4, pp. 312-327.

Timmermans, AA, Seelen, HA, Willmann, RD & Kingma, H 2014, 'Technology-assisted training in chronic stroke: A systematic review of effects on impairments, activity, and participation', *Journal of NeuroEngineering and Rehabilitation*, vol. 11, no. 1, p. 36.

Vakili, M, Bagherzadeh Golmakani, Z & Bolghan-Abadi, M 2024, 'The effectiveness of dialectical behavior therapy on self-blame and mental rumination in binge-eating patients', *Journal of Psychological Science*, vol. 23, no. 139, pp. 1791-1809.

Valentine, SE, Bankoff, SM, Poulin, RM, Reidler, EB & Pantalone, DW 2015, 'The use of dialectical behavior therapy skills training as stand-alone treatment: A systematic review of the treatment outcome literature', *Journal of Clinical Psychology*, vol. 71, no. 1, pp. 1-20.

Van der Riet, P 2015, 'Global statistics on stroke and prevention strategies', *Lancet Neurology*, vol. 14, no. 8, pp. 918-925.

Venketasubramanian, N, Wong, KS & Zeng, X 2017, 'Stroke mortality in Southeast Asia: Current situation and prevention strategies', *Stroke and Vascular Neurology*, vol. 2, no. 1, pp. 4-9.

Whitehead, AL & Baalbergen, EJ 2019, 'The financial impact of stroke rehabilitation on patients and families', *Journal of Neurological Sciences*, vol. 344, no. 1-2, pp. 101-107.

Wibbelink, CJ, Arntz, A, Grasman, RP, Sinnaeve, R, Boog, M, Bremer, OM, Dek, EC, Alkan, SG, James, C, Koppeschaar, AM & Kramer, L 2022, 'Towards optimal treatment selection for borderline personality disorder patients (BOOTS): a study protocol for a multicenter randomized clinical trial comparing schema therapy and dialectical behavior therapy', *BMC Psychiatry*, vol. 22, no. 1, p. 89.

Winstein, CJ, Stein, J, Arena, R, Bates, B, Cherney, LR, Cramer, SC, Deruyter, F, Eng, JJ, Fisher, B, Harvey, RL, Lang, CE, MacKay-Lyons, M, Ottenbacher, KJ, Pugh, S, Reeves, MJ, Richards, LG, Stiers, W & Zorowitz, RD 2016, 'Guidelines for adult stroke rehabilitation and recovery: A guideline for healthcare professionals from the American Heart Association/American Stroke Association', *Stroke*, vol. 47, no. 6, pp. e98-e169.

World Health Organization 2022, 'Global stroke epidemiology and the impact on public health', available at: [http://www.who.int/stroke/global\\_impact](http://www.who.int/stroke/global_impact).

Yu, S 2013, 'Coping strategies and mental health outcomes in stroke survivors',  
Psychological Research and Therapy, vol. 30, no. 4, pp. 453-461.

## Appendix – A

### Institutional Review Board (IRB) Letter

SCMST-BPT/IRB/05-23/004

To

Azharul Islam  
4<sup>th</sup> Year Student of B.Sc. in Physiotherapy  
Session: 2018-2019, Reg No: 10434  
SAIC College of Medical Science & Technology (SCMST)  
Mirpur-14, Dhaka-1216, Bangladesh

**Subject: Approval of the thesis proposal “Evaluating the Impact of Dialectical Behavior Therapy Along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors” by ethics committee.**

Dear, Azharul Islam  
Congratulations.

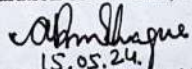
The Institutional Review Board (IRB) of SCMST has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	RESEARCH PROPOSAL
2	Close ended Questionnaire (English version)
3	Information sheet & consent form.

The purpose of the study is to find out the impact of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors. The study involves face to face interview by using close ended questionnaire to explore the impact of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors in Bangladesh that may take 30 to 40 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09.00 AM on 28th September 2023 at SCMST.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring during the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

  
15.05.24  
Dr. Abul Kasem Mohammad Enamul Haque  
Principal, SCMST & Chairman, Institutional Review Board (IRB)  
SAIC College of Medical Science & Technology (SCMST)  
Mirpur-14, Dhaka-1216, Bangladesh

## Appendix –B

### Permission for Data Collection

20<sup>th</sup> May 2024

To

Head of the Department,

Vision Physiotherapy Center

Uttara, House 42 Lake Dr Rd, Dhaka 1230

Subject: Prayer for permission to collect data from the Neurology unit to conduct a research project.

Sir,

With due respect and humble submission to state that I am a student of B.Sc. in Physiotherapy at SAIC College of Medical Science and Technology (SCMST). As a part of our course curriculum, we have to conduct a research project for the partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. My research title is **“Evaluating the Effectiveness of Dialectical Behavior Therapy along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors”** and the aim of the study is to find out the impact of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors. This is a randomized control trial under the supervision of Zakia Rahman, Lecturer SCMST. I have chosen the Neurology unit of your clinic as a site of data collection.

So, I, therefore, pray and hope that you would be kind enough to give permission for data collection that will help me to complete my study.

Yours Faithfully

MD. Azharul Islam

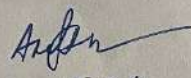
Student of B.Sc. in Physiotherapy

Session: 2018 -2019

Reg No: 10434

SAIC College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka 1216, Bangladesh.

  
20.05.24  
Dr. Arafath Hossain, PT  
BPT (GB)  
Incharge-Neurofit  
Clinical Physiotherapist  
Vision Physiotherapy centre

Appendix –C

Application for Data Collection

**Permission Letter**

20<sup>th</sup> May 2024

To

Head of the Department,

UNIQUE PAIN AND PARALYSIS CENTRE

Block-A, RHS Tower, Plot-23 Rd 3, Dhaka 1216

Subject: Prayer for permission to collect data from the Neurology unit to conduct a research project.

Sir,

With due respect and humble submission to state that I am a student of B.Sc. in Physiotherapy at SAIC College of Medical Science and Technology (SCMST). As a part of our course curriculum, we have to conduct a research project for the partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. My research title is **“Evaluating the effectiveness of Dialectical Behavior Therapy Along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors”** and the aim of the study is to find out the impact of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors. This is a randomized control trial under the supervision of Zakia Rahman, Lecturer SCMST. I have chosen the Neurology unit of your clinic as a site of data collection.

So, I, therefore, pray and hope that you would be kind enough to give permission for data collection that will help me to complete my study.

Yours Faithfully

MD. Azharul Islam

Student of B.Sc. in Physiotherapy

Session: 2018 -2019

Reg No: 10434

SAIC College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka 1216, Bangladesh.

*Approved*

5/20/24  
25/5/24

Med. Physio. Dept. SAIC College of Medical Science and Technology (SCMST)  
Mirpur-14, Dhaka 1216, Bangladesh.

**Appendix – D**

**Consent From Bangla and English**

CONSENT STATEMENT (English)

**Please Read It Carefully**

Assalamualaikum!

I am MD. Azharul Islam, a student of B.Sc. in physiotherapy, 4th year 2018-19 session, at Saic College of Medical Science & Technology, affiliated with the University of Dhaka under the faculty of Medicine. I am conducting a research program entitled "Evaluating the Effectiveness of Dialectical Behavior Therapy along with Usual Physiotherapy Intervention on Emotional Regulation and Coping Skills Among Stroke Survivors." In this study, I would like to find out the effect of dialectical behavior therapy along with usual physiotherapy intervention on emotional regulation and coping skills among stroke survivors.

I would like to request some information regarding your sociodemographic, functional independence, and medical information-related questions. Please note that this academic research project will take approximately 20-30 minutes to complete.

Participating in this study will not affect your current or future treatment in any way.

It is important to mention that the information collected will only be used for academic research purposes, and all your provided data will be kept confidential. In the case of any report or publication, we will ensure that your identity remains anonymous.

Your participation in this study is voluntary, and you may withdraw at any time during this study without any negative consequences. You also have the right not to answer a question you don't like or do not want to answer during the interview.

If you have any questions regarding the study or your rights as a participant, please feel free to contact the investigator MD. Azharul Islam or the research supervisor Dr.

Zakia Rahman (PT), Lecturer Department of Physiotherapy, SCMST, Mirpur, Dhaka.

Do you have any questions before I start?

Yes	No
-----	----

So, may I have your consent to proceed with the interview?

Yes	No
-----	----

Signature of the participant

\_\_\_\_\_

Date.....

Signature of the interviewer

\_\_\_\_\_

Date.....

## Questionnaire (English)

**Title: “Evaluating the Effectiveness of Dialectical Behavior Therapy Along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors”**

### Patient Information

This questionnaire is developed to assess the Effectiveness of Dialectical Behavior Therapy Along with Usual Physiotherapy Intervention on Emotional Regulation and coping Skills Among Stroke Survivors and this section will be filled by a physiotherapist using a pen.

<b>Patient ID:</b>	
<b>Date of test:</b>	
<b>Name of participants:</b>	
<b>Code:</b>	
<b>Address:</b>	<b>Village:</b> _____ <b>Post-Office:</b> _____ <b>Upazila:</b> _____ <b>District:</b> _____
<b>Phone:</b>	

### PART-1: Socio-Demographic Information

[Please give a tick (✓) mark at the left side box of the best correct answer]

Question No	Questions/ Information on	Response of the participant
1.1	Age	.....Year
1.2	Gender	0= Male 1= Female
1.3	Marital status	0 = Unmarried 1 = Married

<b>1.4</b>	Educational Qualification	0 = Illiterate 1 = Primary 2 = SSC 3 = HSC 4 = Graduation 5 = Masters or higher
<b>1.5</b>	Occupation (Before Stroke)	0 = Service holder 1 = Businessman 2 = Housewife 3 = Student 4 = Teacher 5 = Labor 6 = Farmer 7= Other.....
<b>1.6</b>	Living area	0 = Rural 1 = Urban
<b>1.7</b>	Family type	0 = Nuclear family 1 = Extended family
<b>1.8</b>	Access Road	0 = Mud 1 = Brick 3 = Pitch

**PART-2: Topic related Information**

<b>Question No</b>	<b>Questions</b>	<b>Response of the participants</b>
<b>2.1</b>	Height	.....

<b>2.2</b>	Weight	.....
<b>2.3</b>	BMI	.....
<b>2.4</b>	Date of incidence	DD/MM/YEAR .....
<b>2.5</b>	Affected side	0 = Right 1 = Left

<b>2.6</b>	Type of stroke	0 = Ischemic 1 = Hemorrhagic
<b>2.7</b>	Duration of stroke	0 = < than 3 months 1 = > than 3 months 2 = > than 6 months 3 = > than 1 year 4 = > than 2 years
<b>2.8</b>	Smoking / Tobacco Habit	0 = No 1 = Yes
<b>2.9</b>	Do you have Hypertension?	0 = No 1 = Yes
<b>2.10</b>	Do you have Diabetes mellitus?	0 = No 1 = Yes
<b>2.11</b>	Monthly income	.....

## Pre Data

### **Brief cope scale**

Please read each statement carefully and circle a number 1, 2, 3 or 4

1= I haven't been doing this at all

2 = I've been doing this a little bit

3 = I've been doing this a medium amount

4 = I've been doing this a lot

<b>1.</b>	I've been turning to work or other activities to take my mind off things.	1	2	3	4
<b>2.</b>	I've been concentrating my efforts on doing something about the situation I'm in.	1	2	3	4
<b>3.</b>	I've been saying to myself "This isn't real."	1	2	3	4
<b>4.</b>	I've been using addictive behaviors or substances to make myself feel better.	1	2	3	4
<b>5.</b>	I've been getting emotional support from others.	1	2	3	4
<b>6.</b>	I've been giving up trying to deal with it.	1	2	3	4
<b>7.</b>	I've been taking action to try to make the situation better.	1	2	3	4
<b>8.</b>	I've been refusing to believe that it has happened.	1	2	3	4

<b>9.</b>	I've been saying things to let my unpleasant feelings escape.	1	2	3	4
<b>10.</b>	I've been getting help and advice from other people.	1	2	3	4
<b>11.</b>	I've been using alcohol or other drugs to help me get through it.	1	2	3	4
<b>12.</b>	I've been trying to see it in a different light, to make it seem more positive.	1	2	3	4
<b>13.</b>	I've been criticizing myself.	1	2	3	4
<b>14.</b>	I've been trying to come up with a strategy about what to do.	1	2	3	4
<b>15.</b>	I've been getting comfort and understanding from someone.	1	2	3	4
<b>16.</b>	I've been giving up the attempt to cope.	1	2	3	4
<b>17.</b>	I've been looking for something good in what is happening.	1	2	3	4
<b>18.</b>	I've been making jokes about it.	1	2	3	4
<b>19.</b>	I've been doing something to think about it less, such as going to movies, watching TV, reading,	1	2	3	4

	daydreaming, sleeping, or shopping.				
<b>20.</b>	I've been accepting the reality of the fact that it has happened	1	2	3	4
<b>21.</b>	I've been expressing my negative feelings.	1	2	3	4
<b>22.</b>	I've been trying to find comfort in my religion or spiritual beliefs.	1	2	3	4
<b>23.</b>	I've been trying to get advice or help from other people about what to do.	1	2	3	4
<b>24.</b>	I've been learning to live with it.	1	2	3	4
<b>25.</b>	I've been thinking hard about what steps to take.	1	2	3	4
<b>26.</b>	I've been blaming myself for things that happened.	1	2	3	4
<b>27.</b>	I've been praying or meditating.	1	2	3	4
<b>28.</b>	I've been making fun of the situation.	1	2	3	4

## Satisfaction scale

Please rate your satisfaction with the intervention by selecting the appropriate number on the scale below:

1. Strongly Dissatisfied
2. Dissatisfied
3. Neutral
4. Satisfied
5. Strongly Satisfied

1.	How satisfied were you with the overall intervention program?	1	2	3	4	5
2.	How satisfied were you with the support and guidance provided by the therapists?	1	2	3	4	5
3.	To what extent did you find the intervention helpful in managing your condition?	1	2	3	4	5
4.	How satisfied were you with the facilities and resources provided during the intervention sessions?	1	2	3	4	5
5.	Would you recommend this intervention to other stroke survivors?	1	2	3	4	5

**Functional Independence Measurement (FIM) scale**

<b>(Total assistance)</b>	1
<b>(Maximum assistance)</b>	2
<b>(Moderate assistance)</b>	3
<b>(Minimum assistance)</b>	4
<b>(Required Supervision)</b>	5
<b>(Modified independence)</b>	6
<b>(Maximum Independence)</b>	7

## Post Data

### Brief cope scale

Please read each statement carefully and circle a number 1, 2, 3 or 4

1= I haven't been doing this at all

2 = I've been doing this a little bit

3 = I've been doing this a medium amount

4 = I've been doing this a lot

<b>1.</b>	I've been turning to work or other activities to take my mind off things.	1	2	3	4
<b>2.</b>	I've been concentrating my efforts on doing something about the situation I'm in.	1	2	3	4
<b>3.</b>	I've been saying to myself "This isn't real."	1	2	3	4
<b>4.</b>	I've been using addictive behaviors or substances to make myself feel better.	1	2	3	4
<b>5.</b>	I've been getting emotional support from others.	1	2	3	4
<b>6.</b>	I've been giving up trying to deal with it.	1	2	3	4
<b>7.</b>	I've been taking action to try to make the situation better.	1	2	3	4
<b>8.</b>	I've been refusing to believe that it has happened.	1	2	3	4

<b>9.</b>	I've been saying things to let my unpleasant feelings escape.	1	2	3	4
<b>10.</b>	I've been getting help and advice from other people.	1	2	3	4
<b>11.</b>	I've been using alcohol or other drugs to help me get through it.	1	2	3	4
<b>12.</b>	I've been trying to see it in a different light, to make it seem more positive.	1	2	3	4
<b>13.</b>	I've been criticizing myself.	1	2	3	4
<b>14.</b>	I've been trying to come up with a strategy about what to do.	1	2	3	4
<b>15.</b>	I've been getting comfort and understanding from someone.	1	2	3	4
<b>16.</b>	I've been giving up the attempt to cope.	1	2	3	4
<b>17.</b>	I've been looking for something good in what is happening.	1	2	3	4
<b>18.</b>	I've been making jokes about it.	1	2	3	4
<b>19.</b>	I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	1	2	3	4

<b>20.</b>	I've been accepting the reality of the fact that it has happened	1	2	3	4
<b>21.</b>	I've been expressing my negative feelings.	1	2	3	4
<b>22.</b>	I've been trying to find comfort in my religion or spiritual beliefs.	1	2	3	4
<b>23.</b>	I've been trying to get advice or help from other people about what to do.	1	2	3	4
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<b>26.</b>	I've been blaming myself for things that happened.	1	2	3	4
<b>27.</b>	I've been praying or meditating.	1	2	3	4
<b>28.</b>	I've been making fun of the situation.	1	2	3	4

## Satisfaction scale

Please rate your satisfaction with the intervention by selecting the appropriate number on the scale below:

6. Strongly Dissatisfied
7. Dissatisfied
8. Neutral
9. Satisfied
10. Strongly Satisfied

<b>1.</b>	How satisfied were you with the overall intervention program?	1	2	3	4	5
<b>2.</b>	How satisfied were you with the support and guidance provided by the therapists?	1	2	3	4	5
<b>3.</b>	To what extent did you find the intervention helpful in managing your condition?	1	2	3	4	5
<b>4.</b>	How satisfied were you with the facilities and resources provided during the intervention sessions?	1	2	3	4	5
<b>5.</b>	Would you recommend this intervention to other stroke survivors?	1	2	3	4	5

## **Functional Independence Measurement (FIM) scale**

<b>(Total assistance)</b>	1
<b>(Maximum assistance)</b>	2
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<b>(Modified independence)</b>	6
<b>(Maximum Independence)</b>	7

## Gant Chart

Activities/ months	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	June 24	July 24	Aug 24
<b>Proposal presentation</b>												
<b>Introduction</b>												
<b>Literature review</b>												
<b>Methodology</b>												
<b>Data collection</b>												
<b>Data Analysis</b>												
<b>Result</b>												
<b>1<sup>st</sup> progress presentation</b>												
<b>Discussion</b>												
<b>Conclusion And Recommendation</b>												
<b>2<sup>nd</sup> progress presentation</b>												
<b>Communication with supervisor</b>												
<b>Final submission</b>												