EFFICACY OF COGNITIVE REHABILITATION THERAPY ON POST-STROKE DEPRESSION AMONG SURVIVORS OF FIRST STROKE ATTACK IN IBADAN, NIGERIA

BY

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A Thesis in the Department of Psychology Submitted to the Faculty of the Social Sciences in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

of the

UNIVERSITY OF IBADAN

SEPTEMBER, 2014

CERTIFICATION

I certify that, this work was carried out by OLUKOLADE OLUGBEMI (136605) in the department of Psychology, University of Ibadan, Ibadan, Nigeria, under my supervision.

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DEDICATION

To the three special women in my life – The first (Taiye) who chose Psychology for me, the second (Adejoke) who loves me despite and through the Psychology and (Morire) who I strive on in Psychology to impress.

ACKNOWLEDGEMENTS

It is a privilege and honor to have such wonderful supervisor and in this I sincerely wish to express my gratitude to my supervisor, Professor Helen O. Osinowo for her guidance, continued support and understanding which have greatly sustained me through this process. You provided the encouragement to complete the work, for this I am grateful to you and I pray the Lord keeps and blesses you.

Again, my deepest thanks to the head of department Professor B.O. Ehigie, your efforts over the work is sincerely appreciated. I also express gratitude to Dr B.O. Olley, Dr. A O. Adejumo and Dr Okhakume, for their valuable contributions throughout the study. Your constructive comments and critique considerably improved the thesis.

Furthermore, my sincere thanks to Professor A.M Sunmola, Professor Balogun, Dr. Olapegba, Dr, Babalola, Dr Adejuwon, Dr J.O. Ekore, Dr Alarape, Dr Okurame, Dr shenge, Dr Taiwo, Dr Asagba, Dr Chowen and Prof. Udegbe in the department who had offered directions formally and informally to the success of this project. Also, all the non-academic staff of the department who directly or indirectly contributed to my success.

My appreciation to Dr Mayowa Owolabi (Consultant Neurolgist), University College Hospital/University of Ibadan and Professor Hamzat (Physiotherapy) for their direction at the beginning of this work which provided the template for the final work, I am so grateful.

My warmest thanks go to Professor and Mrs. Jegede who provided me with valuable guidance and direction, your affection, prayers and encouragements are greatly appreciated. Also, my heartfelt gratitude to Professor Olu Osinowo who guided me in this work from the beginning even to the very end, this work is beautiful because of your extraordinary effort.

I would like to appreciate the Department of Family Medicine, University College Hospital (UCH), Ibadan and the Department of Psychiatry, UCH, Ibadan for their interest in carrying out of this research work. Again, I thank the members of the Physiotherapy Clinic UCH (especially the Head of Department Dr. Taiwo and every member of the Neuro-rehabilitation team) and the Neurology team (under Dr Mayowa Owolabi) who provided the enabling environment to carry out the research, thank

you- what would I have done without you! Also, I acknowledge the Neurology clinic and physiotherapy clinics of Adeoyo General Hospital, Ring road, Ibadan.

During the years of this work, I had to combine this with the work as a clinical psychologist in the University College Hospital Ibadan. I will like to express special gratitude to Dr MMA Ladipo who provided atmosphere to perform my professional work and her concern for the finishing of this project which was continued by Dr A. Irabor. Also, Professor Baiyewu of the Department of Psychiatry. I am also grateful to Dr Laosebikan and Dr Abdulmalik (both consultant psychiatrists) for their constant encouragements and assistance. I acknowledge the assistance rendered by Mr. Oladotun Adeyemo who was a dependable research assistant - I noticed!) and Mr. Chinedu who assisted with the analysis of the data of this study. I also remember the administrative staffs of G.O.P.D (past and present especially Mrs. Anjorin) who ceaselessly print this work…thanks.

I cannot fail to mention the effort of my family, and firstly my only brother Adeife. Also, my parents Mr. and Mrs. Olukolade who initiated my interest in education and Daddy, thanks for all those books on neuro- rehabilitation, they are treating my patients now, I owe a lot to you. Finally, my deepest love to my wife Oluwabusayo, and our children Morireoluwa and Moriyioluwa – we did it! Without your sacrifices and you in my life all these wouldn't have mattered!

Olukolade O.

ABSTRACT

Post-Stroke Depression (PSD) is one of the commonest complications of stroke. There is no clear evidence that PSD is either related to stroke etiologically or an independent disorder. However, there is no adequate treatment for PSD to alleviate the sufferings of survivors. This study was designed to examine the efficacy of Cognitive Rehabilitation Therapy (CRT) in the treatment of PSD among survivors of first stroke attack at the University College Hospital (UCH), Ibadan, Nigeria.

The Bio-psychosocial theory provided the theoretical basis. The study involved a survey, using cross-sectional ex-post facto design and experimental design. For the survey, 90 clinically diagnosed patients were purposively selected at the Medical Out-Patient (MOP), and Physiotherapy clinics of UCH. A questionnaire which focused on Beck Depression Inventory (BDI), Health Orientation (HO), Barthel Index (BI), Perceived Social Support Scale (PSSS), Health Locus of Control Scale (HLCS), Stroke Impact Scale (SIS), Hospital Anxiety & Depression Scale (HADS) and Stressful Event Scale (SES) was administered, while the result of Computer Tomography and prior illness were retrieved from the hospital records. For the experiment, 30 participants with high scores on post–stroke depression were randomly assigned into 3 groups of 10 participants each namely: Cognitive Rehabilitation Therapy (CRT) and Psycho-Education (PE) and Control Group (CG). Cognitive Rehabilitation Therapy consisted of nine sessions with first three sessions focusing on activity stimulation, second three focusing on negative thoughts and the third focusing on people contacts and Psycho-Education (PE) of nine sessions focusing on knowledge on stroke and post-stroke depression and Control (CG) group on waiting list. The BDI scale was used for assessing PSD at post-test. Analysis of co-variance, multiple regression, two way ANOVA, t-test of independent samples were the statistical data analyses techniques adopted at $p \leq 0.05$.

The study had 38 males and 52 females with mean age of 57.33 years (SD±12.72). Social support significantly influenced level of PSD. There was significant interaction effect of age and level of physical dependency on PSD with younger survivors with physical dependence having higher post-test PSD (11.8 ±7.79) than older survivors with physical dependence (11.4 ±8.48). Locus of control and location of hemispheric lesion did not predict PSD. Brain lesion, physical disability and health orientation did not jointly or independently predict PSD ($r = 0.27$, β=-0.69, 0.25, -0.09). Also, patients' age, prior illness and concordance did not predict PSD jointly or independently ($r=0.26$, β=-0.09,-0.02,-0.18). There was significant difference in the efficacy of CRT, PE and CG on PSD, with CRT–CG mean difference of (-9.4±3.11), PE–CG (1.0±3.83). Furthermore, stress was not a confounding variable on the efficacy of CRT. Type of therapy significantly influenced PSD at post-test, with the CRT having greater mean reduction to CG (-11.1±3.1) than PE to the CG (3.0 ±3.8).

Cognitive rehabilitation therapy with culture tailored modules significantly reduced post-stroke depression. Hence, cognitive rehabilitation therapy should be integrated as adjunct treatment of post-stroke depression in clinical practice for enhanced clinical management of stroke survivors.

Keywords: Cognitive rehabilitation therapy, Post-stroke depression, perceived social support

Word Count: 486

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

CHAPTER ONE

INTRODUCTION

1.1 Background

The global burden of disease is on the increase and up to 12 % of this was attributed to mental disorders (WHO 2001a, 2004). Recently it has been estimated that mental illness will account for about 15% of this rising number in the future (WHO, 2004). Among the commonest mental disorders, depression is the second most important cause of disability (Michaud, Murray & Bloom, 2001; Mathers & Loncar 2006; Lopez, Mathers, Ezzati, Jamison, Murray, 2006: Cited in Ola, Crabb, Adewuya, Olugbile & Abosede, 2014). On its own alone it is projected that there will be increased and disproportionate large burden of attributable mental illness in developing countries like Nigeria due to the social risk factors which are rising daily and lack of affordable and efficient treatment methods and specialists, while not overlooking the essential underfunding of mental health (WHO 2001a).

Traditionally, stroke, as defined by the World Health Organization, is a "neurological deficit of cerebrovascular cause that persists beyond 24 hours or is interrupted by death within 24 hours". This definition was supposed to reflect the reversibility of tissue damage and was devised for the purpose, with the time frame of 24 hours being chosen arbitrarily. Post-stroke depression (PSD) is a common reaction to stroke. Depending on the sample size and the assessment tools used, researchers have found that Post-stroke depression occurs in 20% to 40% of stroke patients. (Robinson, 2003) Post-stroke depression has the same signs and symptoms (including disturbed sleep, a lack of interests, guilt or a preoccupation of thought, reduced energy, diminished concentration ability, disturbed appetite, psychomotor agitation or retardation, and thoughts of death or suicide) as does major depressive disorder

(MDD). Four or more of these symptoms, in the presence of depressed mood or anhedonia (the loss of pleasure), for a duration of 2 weeks or longer will satisfy criteria for Post-stroke depression. Post-stroke depression adversely affects a patient's chance (and rate) of recovery and has been associated with more than a 3-fold increase in mortality rates for as long as 10 years after stroke. Post-stroke patients who are also depressed, particularly those with major depressive disorder, are less compliant with rehabilitation, more irritable and demanding, and may experience personality change. Post-stroke depression is the same as the symptoms of normally occurring depression in non-stroke populations with persistent, sad or 'empty' mood, loss of interest or pleasure in ordinary activities including sex, decreased energy, fatigue, being 'slowed down', sleep disturbances (insomnia, early morning waking or oversleeping), eating disturbances (loss of appetite), weight gain or loss, difficulty in concentrating (remembering or making decisions), feeling guilty, worthless or helpless, thoughts of suicide(suicidal ideation), irritability , excessive crying and sometimes chronic aches and pains that don't respond to treatment, hallucinations and delusions.

Stroke is an extremely common rapid onset medical emergency that can cause permanent neurological damage. A sudden loss of brain function caused by a blockage or rupture of a blood vessel to the brain, resulting in necrosis of brain tissue and characterized by loss of muscular control, diminution or loss of sensation or consciousness, dizziness, slurred speech, or other symptoms that vary with the extent and severity of brain damage. Also called cerebral accident, cerebral infarction, cerebrovascular accident, it is caused by an interruption of the blood supply owing to a thrombosis or embolism (ischemic stroke, 80% of all strokes) or due to the rupture of a blood vessel in the brain (haemorrhagic stroke). As a result, the affected area of

the brain is unable to function, leading to a vast array of symptoms including hemiplegia (one sided paralysis) or hemiparesis (one sided weakness), dysphagia (problems swallowing), dysphasia (problems with speech), and incontinence, as well as problems with thinking, awareness, attention, learning, judgment and memory. Stroke can also lead to emotional problems – patients may have difficulty controlling, or may express inappropriate emotions.

Strokes can and usually leaves people with physical disability, cognitive impairment, and communication problems. In addition, there are behavioural, emotional, and psychological consequences. The experience of stroke, hospitalization, or facing up to living with disabilities can affect emotional health (Stroke Association, 2001), which can have important implications for outcome. Of particular significance, depression often co-occurs with stroke irrespective of the culture and clime (Kolawole, 2008; Chriki, Bullain, Stern, 2006; Thompson, 1996 and Kneebone II & Dunmore, 2000). When this happens, the presence of the additional illness, depression, is frequently unrecognized, leading to serious and unnecessary consequences for patients and families. Though depressed feelings can be a common reaction to a stroke, clinical depression is not the expected reaction. For this reason, when present, specific treatment should be considered for clinical depression even in the presence of a stroke. Appropriate diagnosis and treatment of depression may bring substantial benefits to the patient through improved medical status, enhanced quality of life, a reduction in the degree of pain and disability, and improved treatment compliance and cooperation. The association between depression and stroke has long been contemplated for its negative impact on an individual's rehabilitation, family relationships, and quality of life (NIMH, 2008). Appropriate diagnosis and treatment of depression can shorten the rehabilitation process and lead to more rapid recovery

and resumption of routine. It can also save health care costs (e.g., eliminate nursing home expenses). Of the 600,000 Americans who experience a first or recurrent stroke each year, an estimated 10-27 percent experience major depression. An additional 15-40 percent experience depressive symptomatology (not major depression) within two months following the stroke. Three-fourths of strokes occur in people 65 years of age and over. With stroke being a leading cause of disability in older persons, proper recognition and treatment of depression in this population is particularly important.

Stroke itself had been acknowledged as a leading cause of disability (Owolabi, 2013). Strokes had been noted severally as the number one cause of disability and the number two leading cause of death worldwide (Cramer, 2010). One of the commonest psychiatric complication of stroke is post-stroke depression. The National Institute of Mental Health (NIMH) estimated that 10-27% of stroke survivors will experience major depression while additional 15-40% will have symptoms of depression within two months following a stroke (Grossman, 2008). The current prevalence of stroke in Nigeria is 1-14 per 100,000 while the 30-day case fatality rate is as high as 40 percent. Management of the disease is largely conservative while there is little or no funding for high-quality research (Kolawole, 2008). Some of those disabilities could be prevented if stroke victims received better care, suggests new research.

Post-stroke depression (PSD) is one of the most common neuropsychiatric sequelae of stroke (Hayhow, Brockman, & Starkstein, 2014). Post-stroke depression is not only a common sequela after stroke but also one of the most frequent complications of stroke, with a prevalence ranging between 20 and 60% (Altieri, Maestrini, Mercurio, Troisi, Sgarlata, Rea, Di Piero & Lenzi, 2012). Post-Stroke Depression with or without Anxiety (PSDA) is a common disorder in the chronic phase of stroke. Neuropsychiatric problems, such as Post-stroke depression, have a

negative impact on social reintegration and quality of life (Kootker**,** Fasotti, Rasquin, van Heugten, & Geurts, 2012). The Diagnostic and Statistical Manual (DSM) IV categorizes post-stroke depression as "mood disorder due to a general medical condition (i.e. stroke)" with the specifics of depressive features. The importance of psychopathologic illness complicating the post-stroke period is well established (Bourgeois, Hilty, Chang & Servis 2004). Also, in The Diagnostic and Statistical Manual (DSM-V, 2013), neither the core criterion symptoms applied to the diagnosis of major depressive episode nor the requisite duration of at least 2 weeks has changed from DSM-IV. Criterion A for a major depressive episode in DSM-5 is identical to that of DSM-IV, as is the requirement for clinically significant distress or impairment in social, occupational, or other important areas of life, although this is now listed as Criterion B rather than Criterion C. Post-stroke depression may have been more hypothesized to be common in left cortical stroke, while depression without anxiety may be more common in left subcortical stroke (Robinson, 1998). Even when there is suspected post-stroke anxiety disorder usually it includes assessment for co-morbid post-stroke depression which had been shown in researches to reduce post-stroke anxiety when treated singularly. Following stroke, many patients also experience depression, a co-morbidity that has a profound negative effect on overall stroke outcomes (NINDS, 2008). The individual combination and severity of these symptoms are directly related to the affected area in the brain (size and location), they commence rapidly and do not normally progress.

In Nigeria there is an estimated 180,000 Nigerians who experience stroke or recurrent stroke each year, with an estimated 20-40 percent of them experiencing depressive symptoms within the first six months following stroke. The effects are enormous; the impact on the local economy and the financial burden of stroke in

Nigeria has not been estimated. The size of the problem appears to be underestimated by the government as no actual publications or statements exist acknowledging the impact of stroke on the health of the nation. A more up to date and current information on the magnitude of the stroke problem in Nigeria is needed. Majority of the stroke costs are borne by individual families. There is the need to evaluate the percentage of patients dependent on careers and the yearly expenditure on hospital stay, home rehabilitation as well as information on the loss of income for the patient and careers. No one, no matter how rich should/can afford to have a stroke (Thisday Newspaper, March, 2012).

There have been varying conceptions among researchers and neuro-rehabilitators about causes of Post-stroke depression; some propose a primary biological mechanism with stroke affecting neural circuits involved in mood regulation which in turn causes post-stroke depression, while other researchers claim that Post-stroke depression is caused by social and psychological stressors that emerge as a result of stroke. While an integrated bio-psycho-social model including both biological and psychosocial aspects of Post-stroke depression seems warranted, a number of studies seem to suggest that biological mechanisms play a major role in the development of Post-stroke depression. Recovery and rehabilitation is a difficult process by which patients with disabling strokes undergo treatment to help them return to normal life as much as possible by regaining and relearning the skills of everyday living. It also aims to help the survivor understand and adapt to difficulties, prevent secondary complications and educate family members to play a supporting role. Another is that stroke patients show a higher rate of depression compared to orthopedic patients with disabilities of comparable severity (Folstein, Maiberger & McHugh (1977). Recognizing mood disorders after stroke is important as emotional

distress can be detrimental to recovery through fatigue, lack of hope, and reduced participation in rehabilitation (Schubert, Taylor, Lee, Mentari, Tamaklo, 1992). Despite this, psychopathology after stroke especially depression are often not detected or are treated inadequately (Anderson,Vestergard, Ingemann-Nielson, Lauritzen,2004). Depression is considered to be the most common neuropsychiatric consequence of stroke (Robinson, 1997) and is associated with poorer rehabilitation outcome (Herrmann, Black, Lawrence, Szekely, Szalai, 1998; Pohjasvaara Vataja, Leppävuori, Kaste, Erkinjuntti, 2001), lower quality of life (Jaracz & Kozubski, 2002), suicide (Stenager, Madson, Stenager, & Bolseden, 1998), and mortality (House, Knapp, Bamford, & Vail, 2001). It is difficult to determine the prevalence of depression after stroke due to methodological heterogeneity across studies but estimates range from 25 percent to 79 percent (Kneebone & Dunmore, 2000). A systematic review of 51 studies reported a pooled estimate of 33 percent (Hackett & Anderson, 2005a).

Depressive disorders following stroke are common. Estimates of the frequency range from 25percent to 79 percent (Kneebone II & Dunmore, 2000) with most studies indicating the rate being approximately 30 percent Variation in prevalence appears to be the result of differing methods of assessment, classification, and screening instruments used. However, the consistent finding is that many people have low mood, which may require treatment. In theory, the principal treatments available for depression in the general population also apply to depressed stroke patients (Burvill, 1994). Antidepressant medication is often used, (Hibbard, Grober, Stein & Gordon, 1992) but concomitant drug therapies (Lane, Sweeney & Henry, 1994) and adverse effects may also limit the extent to which antidepressant drugs are appropriate. Few studies have considered the use of psychological interventions in the

treatment of depression following stroke. Cognitive behavioural therapy (CBT) is an effective treatment of depression in the general population (Gloaguen , Cottraux , Cucherat & Blackburn , 1998) and in the elderly, (Thompson, 1996) and there had been some indication that it is effective for people with stroke.

Cognitive rehabilitation is a systematically applied set of therapeutic services designed to improve cognitive functioning and participation in activities that may be affected by difficulties in one or more cognitive domains. Diagnosis and treatment of cognitive dysfunction may be conducted in a variety of settings throughout the continuum of medical care. Cognitive rehabilitation is often part of comprehensive interdisciplinary programs. When properly applied, it is based upon sound scientific theoretical constructs and strategic approaches drawn from numerous disciplines in neuroscience, neurophysiology, neurobiology, neuropsychology, neurolinguistics and language development, cognitive development and cognitive neuroscience. In this study, cognitive rehabilitation therapy will be focusing on the psychological perspective of the rehabilitation especially issues dealing with coping with loss of function, loss of independence and the perspectives of reasoning into depressive states. Cognitive rehabilitation therapy is a non-medicinal treatment that involves individually tailored cognitive exercises developed by a Neuropsychologist to retrain and/or improve cognition through correction of neurocognitive deficits such as attention, visual spatial, memory and also depressive symptoms. Cognitive rehabilitation differs greatly from self-initiated, home based cognitive exercises such as computer games, puzzles, etc. This includes professional close monitoring and adjustment of the treatment process, development of specific exercises that precisely target patients' cognitive deficits such as depressive symptomatologies and as related to their life and work, and timely feedback to the patients –all to ensure an effective

treatment that does not waste time and delivers long-term effect. Cognitive rehabilitation therapy enhances the patients' overall cognitive functioning and, thus, helps retain or regain their employment and increase personal independence and ultimately control over life and situation due to illness (NIH,1988).

Individuals who sustain brain injuries frequently have difficulties in arousal, attention, concentration, memory, problem solving, decision making, insight and other areas of cognition that impede their ability to function in everyday activities. Alterations in perception, motor control, balance, emotional functioning, social interaction and control of behavior are also common after brain injury and are closely linked and intertwined with cognitive issues. Cognitive abilities and disabilities must be considered in addressing all areas of functioning including communication, mobility, self-care, social interaction, recreational pursuits, and productive activities such as school or work. Cognitive problems change over time for adults too. Early in recovery, arousal, attention and memory encoding problems may be the issues that are the most obvious; later, difficulties with divided attention, memory retrieval, and executive functioning (cognitive control mechanisms) may be most prominent. Cognitive recovery evolves at a different pace for each person, with many interacting factors affecting recovery. Some individuals with brain injury recover relatively well and return to previous levels of functioning. After more severe injuries, however, recovery may extend over a long period of time with some cognitive problems persisting and becoming permanent. Even after returning to daily life activities, individuals with brain injury frequently experience reduced cognitive efficiency and inconsistency of performance, and persistent difficulty dealing with novel, complex, or stressful situations. These problems may, in turn, lead to emotional difficulties such as frustration, depression and anxiety disorders. In some cases of cognitive

dysfunction, individuals can engage in unsafe activities or unwittingly re-injure themselves. Cognitive disorders make it difficult for some people to monitor changes in their daily health or to reliably comply with medication or medical treatment regimens.

Stroke recovery can be negatively affected by depression because of the loss of motivation to recover and less compliance with rehabilitation programmes amongst sufferers (Grossman, 2008). Thus, prompt treatment of post-stroke depression is essential to enhance quality of life, reduce pain and disability, enhance more rapid recovery from stroke and shorten hospital length stay (Oladiji, Akinbo, Aina & Aiyejusunle, 2009). Consequently, Post-stroke depression is usually treated with antidepressant medication and sometimes combined with psychological therapy. Post-stroke patients who are also depressed, particularly those with clinical depressive disorder, are less compliant with rehabilitation, more irritable and demanding, and may experience personality change. These are the same as the symptoms of normally occurring depression in non-stroke populations. Research had shown that up to half of those who survive a stroke will experience depression at some stage in the first few years. Despite this, most patients are not routinely screened for depression, and only small minorities are properly diagnosed. "Wider recognition of depression would lead to an increase in those being treated which is vital," (The Stroke Association, 2002). "Evidence shows that those with depression appear to recover less well after a stroke compared to those who do not have depression." "Greater recognition of this condition amongst the health professionals could help thousands of stroke sufferers" (The stroke Association, 2002).

Cognitive rehabilitation therapy includes psycho-education, cognitive-behavior therapy and problem-solving therapy in its content for the treatment of

stroke patients as an objective assessment of everyday problem-solving skills seems particularly appropriate and would allow investigators to evaluate whether improvement in problem-solving ability in fact mediates outcomes. Incorporating neuroimaging into psychotherapy research could potentially yield valuable information about the processes underlying treatment response in individuals with executive dysfunction **(**Areán, Raue, Mackin, Kanellopoulos, McCulloch & Alexopoulos, 2010). Problem solving therapy as included in cognitive rehabilitation therapy involves the idea and plan to increase patients' understanding of the link between their current symptoms and their current problems in living. Also, it increases patients' ability to clearly define their problems and set concrete and realistic goals teach patients a specific, structured problem-solving procedure. It emphasizes both thoughts and behaviours in treatment of psychological disorders. According to these theories, changing ineffective thoughts or behaviours and teaching ways of solving the resultant problems will affect mood and alleviate depression.

In cognitive rehabilitation therapy, individuals learn to alter maladaptive thoughts that amplify feelings of helplessness and increase pleasant, social and physical activities which produce positive experiences of patients' own ability to solve problems. In this regard it increases their confidence and feelings of self-control while also restoring their sense of control. They learn to perceive situations as more manageable and respond to these situations effectively, thereby improving their mood and altering their physiology. Cognitive rehabilitation attempts to improve cognitive functioning and participation in activities that may be affected by difficulties in one or more cognitive domains. Diagnosis and treatment of cognitive dysfunction may be conducted in a variety of settings throughout the continuum of medical care. Cognitive rehabilitation is often part of comprehensive interdisciplinary programs.

When properly applied, it is based upon sound scientific theoretical constructs and strategic approaches drawn from numerous disciplines in neuroscience, neurophysiology, neurobiology, neuropsychology, neurolinguistics and language development, cognitive development and cognitive neuroscience. Cognitive rehabilitation therapy is encouraged to be a multidisciplinary approach to patient care and treatment therefore is excepted to be performed by disciplines within the allied health fields, most often by speech pathologists, neuropsychologists, and occupational therapists, (Ashley and Persel,2003). Also, Wellmark BlueCross BlueShield of Iowa concludes that cognitive rehabilitation may be performed by a physician, psychologist, or a physical, occupational or speech therapist, depending on the ailment to be compensated or treated. Some employ internalized procedures while some require orthotic devices, such as books, pagers, alarms or personal digital assistants (PDAs). Other treatments involve reestablishing previous skills and behavior patterns and some involve establishing new skills or enabling adaptation to adjust to problems that are not modifiable. Some cognitive rehabilitation treatments are directly applied using actual functional activities in real-world settings while others improve a specific cognitive process or an activity in a clinical setting that is intended to generalize to actual performance in real-life situations. Persons with brain injury such as stroke may also engage in services aimed at improving emotional, behavioral and psychosocial functioning because these problems are often closely linked to neurocognitive functions. Such services are appropriately delivered by neuropsychologists, speech pathologists and others. Family members and other caregivers also play an important role in reinforcing the consistent use of strategies.

Patients with catastrophic reactions or heightened emotionality in addition to the Traumatic Brain Injury (TBI) do usually benefit from problem solving modules,

cognitive behavioural modules, as these reactions following the TBI may represent a lack of effective coping strategies to stress and other life pressing issues. In Nigeria today, stroke patients are not offered psychotherapeutic interventions and alternatives, though the problems of Post-stroke depression are usually acknowledged in this group. Primary prevention is the key to reducing the burden of the disease in a country with such poor resources (Kolawole, 2008). Despite the high prevalence of psychopathology in stroke survivors especially depression, only one-third of moderately to severely depressed patients in most samples were referred for treatment by mental-health professionals during their hospital stay (Sinyor et.al., 1986). This low treatment rate, which is consistent with that of other studies indicates that post-stroke pathology most especially depression remains largely untreated. This situation may be especially problematic for the subset of patients who also report hopelessness in the range of potential suicide risk.

1.2 Statement of problem

The stroke epidemic is projected to worsen in the developing countries over the next two decade by World Health Organization's report (WHO, 2008), its rehabilitation and hindrances to rehabilitation is a problem to the world at large. The most prevalent mental disorder world over is depression (WHO, 2012) with a 12 month prevalence of 9% (NIMH, 2014). The commonest psychiatric complication of stroke is depression with estimated that 10-27% of stroke survivors experiencing depression while additional 15-40% will have symptoms of depression within two months following a stroke (Grossman, 2008). Post-stroke depression affects general well being, compliance, informal caregivers, quality of life and even prognosis. Not only does this lower their quality of life but it also increases their risk of another

stroke or death (Brown, Hasson, Thyselius, & Almborg, 2012). Post-stroke depression despite its impact on rehabilitation, functioning is often times unnoticed by the physician and when noticed, the survivors are often placed on antidepressants, though it works but comes with its antecedent side effects and cost, unlike psychotherapy which is cheaper, works better and shown to have lower relapse rate. Cognitive rehabilitation therapy is well proven and there are convincing evidences demonstrating the effectiveness of Cognitive rehabilitation for stroke patients, CSN, (2005- 2009). Cognitive rehabilitation therapy is not limited to improving physical disability, it attempts to enhance functioning and independence. Insurance carriers pay increasingly more attention to the published research about Cognitive Rehabilitation for neurological patients and many insurance plans now consider it as a covered treatment of choice. Many of the medical conditions that predisposes to stroke such as high blood pressure, diabetics, sickle cell, obesity are especially common among Africans and 1 out of 7 black person (African Americans inclusive) are Nigerians, placing this population at a higher risk of having a stroke (NIH,2009). In addition, studies have shown that when vascular cognitive impairment was exacerbated by depression, poorer recovery and greater risk of mortality were observed. These findings underline the importance of detecting and treating neuro-cognitive deficits and depression after stroke (Canadian Stroke Network, 2003-2009).

Cognitive deficits in stroke survivors do contribute to their overall disability, therefore, it is important to investigate the treatment options that specifically address cognitive dysfunction in this population (CSN, 2003-2009). Post-stroke depression is currently becoming more staggering problem worldwide due to better medical treatment advances which make those with the attack have better survival rate. Post-stroke depression unfortunately, affects not only the victim(s) but also the family,

caregiver and the society. However, psychopathology (depression following stroke (PSD) affects up to 33% of patients and this is significantly associated with increased mortality in the long run.

Usual care involves pharmacotherapy, physiotherapy, speech therapy. Antidepressant drugs have several side effects; therefore novel treatments are needed (Bueno V.F, Brunoni A.R., Boggio P.S., Bensenor I.M. & Fregni F, 2011) the care of stroke survivors are expected to be done in a multidisciplinary setup. The recognition of mood disorders after stroke is important because, emotional distress can be detrimental to recovery through fatigue, lack of hope, lack of adherence to drug regimen and reduced participation in rehabilitation. Many issues remain regarding the phenomenon of post-stroke psychopathology. One of the most important is the potential negative impact of depression on patient participation in the rehabilitation process and the associated rehabilitation outcome. In particular, it is of interest to assess the impact of depression during the sub acute phase of recovery when rehabilitation efforts are thought to be most critical in determining outcome (Feigenson, McDowell, Meese, McCarthy and Greenberg, 1977). Post-stroke depression (PSD) is extremely common (Robinson, 2007a) and it is too common to be ignored or overlooked.

In Nigeria the paucity of research on post-stroke psychopathology and its associated risk factors further confound the problem. The result of the pilot study conducted by the researcher in the stroke ward (Neurology unit of the medicine department) of the University College Hospital(UCH), Ibadan, using in- depth interview confirm that patients do have Post-stroke depression and anxiety. That the thought processes following stroke are aided by the loss of functions, the asking of why me(s), what will happen if the people I am dependent on are not around, loss of

social independence and what to do with obvious disabilities which cannot be prevented from public glare. Sudden crying spells and exasperated sighs of hopelessness in thoughts and actions were noted in the patients. Psychological reactions to stroke are manifested in myriad ways in the days, months, and years after a stroke. Although not every patient develops intense emotional responses to stroke, those who do often have risk factors that make them more vulnerable to psychological consequences. Attention paid to those patients who may benefit from psychotherapeutic treatments as well as from psychotropic medications can facilitate effective treatment.

A study of the efficacy of Cognitive rehabilitation therapy in the care of this special population could suggest how best to deal with this burgeoning illness. Again, when practitioners understand, through evidenced based researches and studies, the alternative yet highly functional methods of treatment of the post stoke depression it will help to stem out the illness. Professionals managing the illness such as clinical psychologists, psychiatrists, neurologists, physiotherapists and speech therapists will understand steps to take to ensure that survivors receive the best possible treatment for better outcomes.

There is a pressing need for further research to improve clinical practice in this area of stroke care (Hackett et.al 2005). The following questions therefore arise:

1. What will be the prevalence of post –stroke depression among the stroke survivors of the University College Hospital, Ibadan?
2. What will be the contribution of age, prior illness, academic status, gender, lesion location, religion and concordance to the development of post stroke depression among survivors of first attack stroke in University College Hospital, Ibadan?

3. Will psychosocial factors affect Post-stroke depression in stroke survivors at the Neurology/ Physiotherapy unit of University College Hospital, Ibadan as a case study?
4. Will physical disability and brain lesion determine Post-stroke depression in stroke survivors at the Neurology/ Physiotherapy unit of University College Hospital, Ibadan as a case study?
5. What will be the relative contribution of cognitive rehabilitation therapy to the treatment of Post-stroke depression in stroke survivors in the University College Hospital, Ibadan (UCH) as a case study?

1.3 Purpose of study

The general purpose of this study is to investigate the efficacy of cognitive rehabilitation therapy on Post-stroke depression and assess the influence of brain lesion physical disability and psychosocial factors on post-stroke depression and health orientation.

The specific objectives of the study are:

- The prevalence of post-stroke depression among the population of stroke survivors
- To examine whether there will be significant influence of location of lesion on post-stroke depression in the stroke patients.
- To predict the influence of physical disability on post-stroke depression in stroke patients.
- To examine whether there will be influence of the level of perceived social support on post-stroke depression in stroke patients.

- To examine the extent of the influence of health locus of control on post – stroke depression in stroke patients.
- Whether the number of previous cerebro-vascular accidents on post- stroke depression will be different.
- To understand if the role of religions will be significantly different on post-stroke depression
- To design appropriate and replicable cognitive rehabilitation modules in the treatment of post –stroke depression in patients during rehabilitation and recovery
- Whether there will be significant efficacy of cognitive rehabilitation therapy in the treatment of post-stoke depression in stroke survivors than psycho education and control waiting list.

1.4 Relevance

The stroke epidemic is projected to worsen in the developing countries over the next two decade by World Health Organization's report (WHO, 2008). Its rehabilitation and hindrances to rehabilitation is a problem to the world at large however, a specific problem to these developing countries and especially Nigeria because of her size, neglect of rehabilitation developmental projects through heavy governmental corruption and lack of efforts by the government and professional bodies, thereby having a heavy reliance on foreign rehabilitation programs which are not suitable for this environment.

Another significant relevance of this study is the development of Psychological Impairment Index Scale for the use among stroke survivors. This instrument will be for the understanding of the way stroke patients feel in their own

words and be able to offer help in these specific domain. Another, significant thrust of this research is in its theoretical and knowledge relevance because it will bring out the bio-psychophysical factors that affect the development of post-stroke psychopathology especially depression in stroke populations. There had been a dearth of research in this area because the available researches had been focused on the biological aspects and physiological sides of stroke patients, but this study is looking at providing useable / step by step manual modules for treatment of stroke survivors in Nigeria and the world at large. The studies done in these areas before are in the western cultures and they had been carried out by nurses and other health workers who do not have prior training in psychological interventions which brings in major flaws in the method of carrying out the research. Although studies have documented the efficacy of problem solving and cognitive behavioural therapy (in separate usages) in the western cultures (Kneebone & Dunmore, 2000; Mitchell et al., 2008; Busko, 2008) and conflicting results using cognitive behavior therapy alone but not cognitive rehabilitation therapy. These studies did not assess the physical disabilities as precipitating factors for post – stroke depression and more importantly, no study had been done in the area of psychotherapeutic intervention for Post-stroke depression patients in Nigeria. Continuing advances in cognitive neuroscience have broadened our understanding of the anatomy and neurophysiology of cognitive function and its disruption after brain injury. Recent work in basic neuroscience has also enhanced knowledge of learning and brain reorganization after injury, especially in response to the highly structured treatment provided in rehabilitation. Further research will continue to provide the underpinnings for theory and design of effective rehabilitation, including treatment for cognitive dysfunction (Brain Injury Association of America, 2006).

The importance of taking care of a special population of stroke survivors cannot be overemphasized in terms of reduction in the burden of care, higher quality of life of survivors and care givers, better health outcomes and adherence to treatment regimes which will chart a blueprint for the care of the stroke survivor population. Therefore, there is significant potential benefit for effective prevention, diagnosis, and treatment of Post-stroke depression. The use of the practical and follow-able modules will further enhance the understanding of psychological dysfunction in plain medical/physical illness and how this can be tackled. It will also assist in the development and evaluation of further developments of new treatment approaches. In addition, this study will empirically determine the influence of bio-psychosocial factors on post – stroke depression, providing better understanding of the dynamics at play, so that the neuro – multidisciplinary team members can predict more accurately who is likely to be depressed after a stroke episode and the designing of the functional analysis in treatment and its evaluation.

Treatment services for post – stroke survivor population are haphazard to say the least in many LAMIC (Low and Medium Income Country) countries like Nigeria, despite the availability of professionals who can provide this services and efficacy of their service delivery packages either because the primary physicians are not promoting the use of these services or because of the unawareness of the availability and efficacy. This is a major hurdle this research work is crossing in bringing the empirical and evaluating the evidence in the scientific podium.

Finally, although Psychotherapeutic interventions had not always been accessible to patients in the neurological clinics in Nigeria, involvement of clinical psychologists can help patients in thorough assessment, enhance coping strategies and mechanisms and engage in effective thought processes and behaviour by keeping in

mind the specific needs of these patients. These clinicians can facilitate coping processes whenever they treat their patients to understand what part of the illness is under their control (e.g. by supplying them the resources that they can draw from in the process of rehabilitation and by teaching them constructive cognitive rehabilitation strategies and social skills training).

Considerable progress has been made in the development of cognitive rehabilitation methods that improve practical, daily life function in stroke patients. Overall, support exists for the effectiveness of cognitive rehabilitation of neglect and aphasia in stroke. However compensatory strategies are the mainstay of managing patients with memory disturbances. Cognitive scientists and rehabilitationists must work ever more closely to fulfill their potential for furthering scientific understanding of the brain and improving the lot of patients.

CHAPTER TWO

LITERATURE REVIEW

2.0 Theoretical Background

This chapter deals specifically with the review of relevant theories and empirical literatures. It will be approached thus: Explanations on medical model, application of the medical model to the study, criticism of the medical model, bio-psycho-social model, application of the bio-psychosocial model to the study, criticism of the bio-psychosocial model, cognitive theory of depression, application of cognitive theory of depression, criticisms of the cognitive theory of depression, Levin's conservation model (Levin,1967), application of the Levin's theory, criticisms of the Levin's theory, Ruminative response styles theory(Nolen-Hoeksema,1991), application of ruminative response styles, criticisms of ruminative response styles, Health belief theory (Hochbaum, Rosentock, and Kegels,1958), applications of health belief model theory, criticisms of health belief model, Ecological theory (Brofenbrenner, 1994), Application of ecological theory and criticisms of the ecological theory.

2.1 Definition of Health and Depression

The phrase 'complete well-being' remains as elusive as it is positive, and health, illness and medicine are related in complex ways. The medical model of health, though often charged with 'reductionism', at least has the attraction of cutting through some of these knots. Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1946). As much as health is more than just physical health, it encompasses emotional stability, focused and clear thinking, ability to reciprocate love, care, adapt to changes due to life

events, higher executive function and continuing sense of spirituality. These are most of the functions withdrawn when individuals are struck by a stroke episode. Depression is common after stroke which is described in the DSM-IV as depression after a general medical condition such as stroke commonly called post-stroke depression. Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration.

Depression can be long-lasting or recurrent, substantially impairing an individual's ability to function at work or school or cope with daily life. At its most severe, depression can lead to suicide. When mild, people can be treated without medicines but when depression is moderate or severe they may need medication and professional talking treatments.

2.2 Theories of Health and depression

For many illnesses and state of health there are different aetiologies. There are many reason people are sick and continue been sick. Depression is a difficult illness and not merely straightforward in explaining because an event can cause depression but the same may not in another. Some theories like the medical model believe the faulty brain wiring is the main problem in the development of depression i.e. "the frontal lobes of the brain, the part associated with higher cognitive processes, displayed lower activity levels than those in non-depressed patients". Other brain imagining reveals breakdown in normal patterns of emotional processing that impedes the ability of depressed patients to suppress negative emotional states. While, another dimension is that, depressed people typically have a heightened state of self-awareness about their lack of coping skills that often leads them to self-criticize and

withdraw from other people (e.g., depressed people may avoid social functions and get even less positive reinforcement than before). To make matters worse, some depressed people become positively reinforced for acting depressed when family members and social networks take pity on them and provide them with special support because they are "sick".

2.2.1. Medical Model

The medical model is a concept of the development of illness that believe that curing or at least resolving the distressing part of illness is mostly or completely dependent on an in-depth clinical understanding of illness to control its course. In relation to psychopathology it believes that disorders have an organic or physical cause The dominant model of disease today is biomedical, with molecular biology its basic scientific discipline. It assumes disease to be fully accounted for by deviations from the norm of measurable biological (Somatic) variables. It leaves no room within its framework for the social, psychological, and behavioral dimensions of illness. The biomedical model not only requires that disease be dealt with as an entity independent of social behavior, it also demands that behavioral aberrations be explained on the basis of disordered somatic (biochemical or neurophysiological) processes. Thus the biomedical model embraces both reductionism, the philosophic view that complex phenomena are ultimately derived from a single primary principle,and mind-body dualism, the doctrine that separates the mental from the somatic. Here the reductionistic primary principle is physicalistic; that is, it assumes that the language of chemistry and physics will ultimately suffice to explain biological phenomena. The medical model is a prevailing and dominant view of pathology in the world (Novello, 1999; Kaplan & Sadock, 1998). The medical model relies exclusively on biological

explanations of diseases and illness and its interpreted in terms of malfunction of organs , cells and other biological systems (e.g. heart disease, loss of oxygen to brain, liver disease or osteoporosis).

Within the medical model, the health of a population is measured in terms of vital statistics, which are data on the degree of illness (morbidity) and the number of deaths (mortality) in a given population. Vital statistics usually include prevalence (total number of people in a community with the particular health status) and incidence (the number of new cases of diseases or illnesses during a particular period of time usually per 100,000 populations). The medical model tends not to deal with the social problems that affect health and only with difficulty integrates mental and behavioural issues that do not derive from diseased organs. In the medical model, health is restored by curing a disease or restoring function to a damaged body part and it rarely considers psychological or social factors in the cause, diagnosis and in the treatment. The reliance on biological interpretations of illness has contributed greatly to the success of the medical model. Anyone who has been cured of a serious infection by taking antibiotics or undergone a life saving surgical procedure can attest to that. On the other hand, that same reliance on biological thinking has not furthered the understanding of health and illness in terms of psychological and social factors, nor has it been very successful in encouraging healthy lifestyles and reducing unhealthy lifestyles and behaviors. For example, type 2 diabetes, which is one of the causes of stroke, is now a worldwide pandemic, that is caused by the excess consumption of high fat, low-nutrient food and by modern lifestyles that lack most forms of physical activity. Harvard School of Public Health estimates that 92% of all type 2 diabetes cases could be avoided by changes in diet and lifestyle (Liebman, 2008). Rather than addressing personal living habits and social conditions, the

response of the medical model to type 2 diabetes is to treat patients with drugs, surgery, or both to alter the biological aspects of the disease (Edlin & Golanty, 2010). Loss of oxygen to the brain is the main cause of stroke due to ischemic stroke or hemorrhagic stroke, about 80–85 % of strokes are ischemic and 15–20 % are hemorrhagic. The causative mechanism may be related to local intracranial vascular pathologies such as atherosclerosis, a more distant source of pathology such as emboli from extra cranial artery disease or the heart, or reduced cerebral perfusion in the setting of circulatory failure. These categories are further subdivided based on the causative process see Fig 2.1.

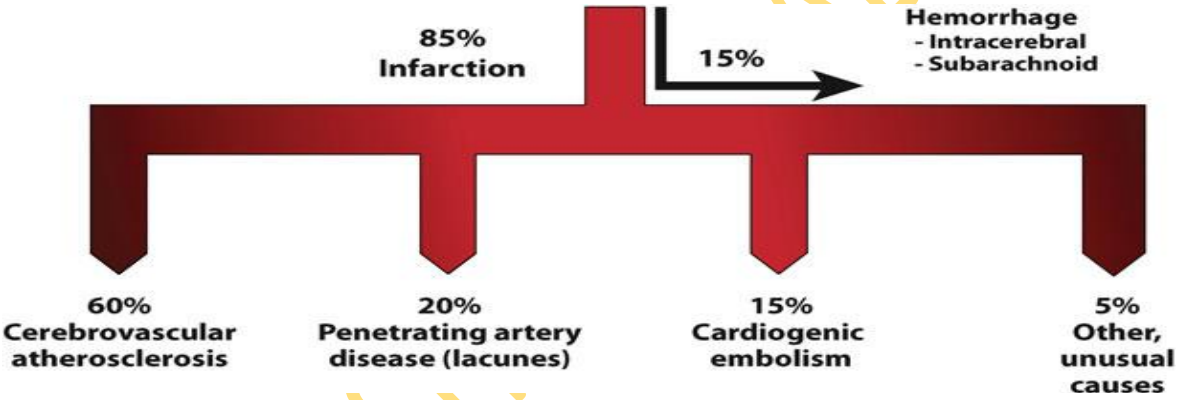


Fig: 2.1. Stroke etiologies due to the medical model source Schweizer and Macdonald (2014)

Most people in the medical profession especially physicians prefer the medical model for all diseases. The psychologist may see illness as a neurotic or psychotic activity due to improper learning of behavior or the reinforcement by society or others. But most often than not the physicians are more comfortable if they visualize illness whether emotional or mental illness as a sickness – this serves a function of stabilizing pathology. Disease, in the medical sense requires a locus, visualizing the disease- the lymphatic or cardiovascular pathways, but the medical model cannot embrace disembodied disease. Function, or dysfunction, without structure is medically unthinkable. Since the brain is the organ of thinking, and ‘emotioning’,

must we think of psychopathologies also as diseases of the brain? (Whatsisname, 1996). Therefore, the first model, in which post-stroke psychopathology symptoms especially depression are primarily explained is about its neurobiological nature and are associated with the location and extent of the neurological insult, is based on the early work of Robinson and colleagues.

Post-stroke psychopathology is regarded as a disease in the same category as any other physical illness; this model uses similar model in defining post-stroke depression and post-stroke anxiety as that used by medical practitioners. Therefore, post-stroke depression is described as a form of depression arising as a consequence of the specific brain lesion and presumably subsequent changes in neurotransmitters. Accordingly, Folstein, Maiberger & McHugh (1977) observed that stroke patients suffered more from depression than equally physically impaired orthopaedic patients, thereby suggesting that the brain lesion itself could influence mood. While post-stroke anxiety is understood to be a form of anxiety precipitated by extent and place of specific brain lesion and its subsequent neurotransmitter changes in the brain. Furthermore, differences in emotional reactions depending on hemisphere of the infarct suggested an organic basis of post-stroke depression (Sinyor, Jacques, Kaloupek, Becker, Goldenberg, Coopersmith, 1986). The major support that medical theory has for post-stroke depression is that it tends to be episodic, as many physical diseases, secondly symptoms of depression as a whole presents disruptions in vital bodily functions such as insomnia, fatigue, loss of memory and loss of sexual libido. Furthermore, it responds to drug therapies such as serotonin selective reuptake inhibitors (SSRI's) and can also be induced by certain drugs.

The medical model was devised by medical scientists for the study of disease. As such it was a scientific model; that is, it involved a shared set of assumptions and

rules of conduct based on the scientific method and constituted a blueprint for research. Not all models are scientific. Indeed, broadly defined, a model is nothing more than a belief system utilized to explain natural phenomena, to make sense out of what is puzzling or disturbing. In our culture the attitudes and beliefs systems of physicians are molded by this model long before they embark on their professional education, which in turn reinforces it without necessarily clarifying how its use for social adaptation contrasts with its use for scientific research. The medical model of an illness is a process that moves from the recognition and palliation of symptoms to the characterization of a specific disease in which the aetiology and pathogenesis are known and treatment is rational and specific (Engel, 1977).

Despite bold attempts by bodies such as the World Health Organisation (WHO) to argue for a definition of health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity', most medically related thought remains concerned with disease and illness. This is hardly surprising, given the fact that people turn to medicine in times of trouble, not when they are feeling well. It has also been found that promotion of positive health, whether by doctors or 'health promoters', competes with other valued goals, for individuals and for societies as a whole. Matters become even more complicated when it is realized that the presence of 'disease or infirmity' does not, in any event, mean that people always regard themselves as unhealthy – as we shall see below.

The main point of this model of disease is that it attempts to uncover underlying pathological processes and their particular effects. The problem with earlier, symptom-oriented approaches to health was that no such sequences of events could be established, and treatment could only be symptomatic. In the case of post-stroke depression, the symptoms are also found in stroke itself, and this problem of

linking symptoms to specific underlying mechanisms frustrated medical development. Although observation and the treatment of symptoms were established practices in early modern medicine, and have remained important to physicians ever since, it was often difficult to distinguish such approaches from a wide variety of unorthodox practices.

According to the medical model there are two main types of stroke Ischaemic strokes these happens when there is a blockage in artery that carries blood to the brain with several causes a blood clot forms in a main artery to the brain or blood clot, air bubble or fat globule forms in a blood vessel and carried to the brain or blockage in the tiny blood vessels deep inside the brain see figure 2.2, figure 2.3. While Hemorrhagic strokes happen when a blood vessel bursts and bleeds into the brain (a hemorrhage).The hemorrhage may be due to a vessel bursting within the brain itself, or a blood vessel on the surface of the brain bleeding into the area between the brain and the skull see fig 2.2, fig 2.3.

Pictures of Major Stroke types on the brain

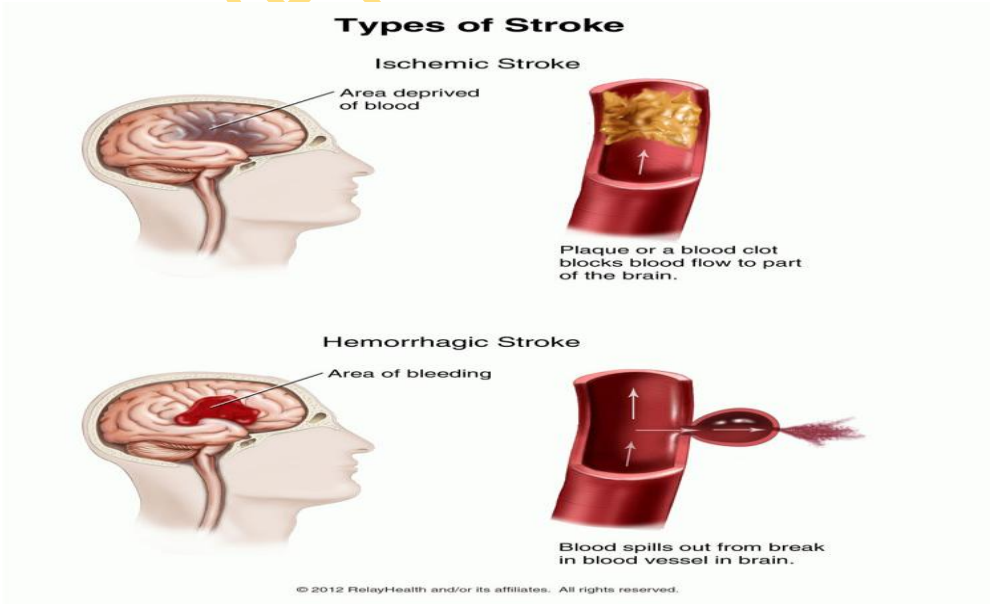


Fig: 2.2 Showing Ischemic and hemorrhagic stroke source www.baagu.net

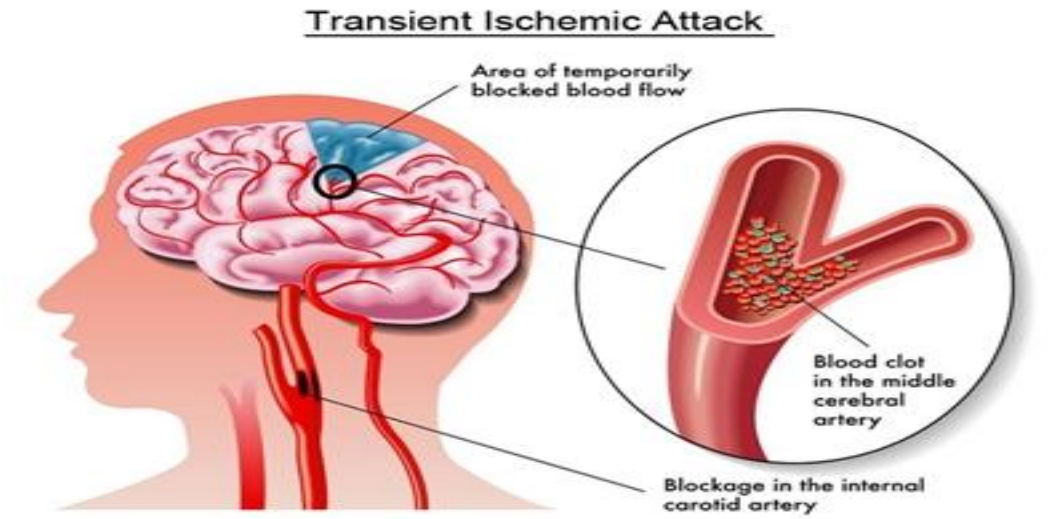


Fig: 2.3 Showing Transient Ischemic attack on the brain

Source: www.eeye.co.zw

2.2.1.1 Criticism of the medical model

No matter the appropriateness of a theory, it cannot explain all the aspects of the concept of an illness or issue. The medical model has a major flaw in convincing physical causes for most mental illnesses must throw the validity of the medical model into question, for example affective disorders and neuroses. For this reason, many mental disorders are called 'functional'. A test case such as depression but even here genetic or neurochemical explanations are inconclusive. The medical model is therefore focused on physical causes and largely ignores environmental or psychological causes. The treatments have serious side-effects, for example ECT can cause memory loss, and they are not always effective. Drugs for depression many times do not 'cure' the condition, but simply act as a chemical straitjacket.

The medical model has been the one that has been most influential in determining the way that mentally disturbed people are treated, but most

psychologists would say that at best, it only provides a partial explanation, and may even be totally inappropriate.

2.2.1.2 Application of the Medical model to the study

The medical approach to illness stabilizes the physician and patient as an illness with a discernible pathology, a treatment that the physician bestows on the patient and in terms of stroke, brain tissue dies within minutes of arterial occlusion, the time depending on the severity and duration of the blood flow reduction. In the minutes to hours following cerebral vessel occlusion in an ischemic infarct, the central core of the infarct is surrounded by an area of structurally intact but functionally impaired tissue at risk of further injury known as the ischemic penumbra. A sequence of events follow stroke attack including energy depletion, calcium channel disruption, glutamate and free radical release, cell membrane and ion homeostasis disruption, and inflammation (Dirnagl, Iadecola, Moskowitz, 1991).These changes can result in further tissue damage and research efforts have been directed to develop neuroprotective drugs to interrupt this sequence of events and protect the tissue at risk in the zone of the ischemic penumbra, to prevent further extension of the infarct. So far the more successful approach has been to administer thrombolytic drugs such as tissue plasminogen activator (tPA) within 3–4.5 hours of the ischemic stroke in order to restore blood flow. Also, in the understanding of depression, the primary biological mechanism is proposed to be the cause of post-stroke depression, whereby ischemic insults directly affect neural circuits involved in mood regulation (Robinson, 2005). An injury to the brain's catecholamine pathway reduces the release of neurotransmitters with a likely depression as a result. A depletion in cortical biogenic amines is found after a disruption of frontal-subcortical circuits after stroke, (Dieguez,

Staub, Bruggimann, Bigousslavsky, 2004).However, there are also arguments for a psychological basis of PSD put forth by researchers.

2.2.2. BIO-PSYCHO-SOCIAL-MODEL (George Engel 1977)

The biopsychosocial model is a general model or approach that posits that biological, psychological (which entails thoughts, emotions, and behaviors), and social factors, all play a significant role in human functioning in the context of disease or illness. Indeed, health is best understood in terms of a combination of biological, psychological, and social factors rather than purely in biological terms. This is in contrast to the traditional biomedical model of medicine that suggests every disease process can be explained in terms of an underlying deviation from normal function such as a pathogen, genetic or developmental abnormality, neurotransmitter, or injury. Health is traditionally equated to the absence of disease. A lack of a fundamental pathology was thought to define one's health as good, whereas biologically driven pathogens and conditions would render an individual with poor health and the label "diseased". However, such a narrow scope on health limited our understanding of wellbeing, thwarted our treatments efforts, and perhaps more importantly, suppressed prevention measures. This model has been developed from general system theory and describes the interaction of body and mind. The biological-basis of illnesses is widely prevalent in our mainstream culture (i.e. stroke is caused by biological basis; depression or anxiety has a neurotransmitters in balance cause). To some it is as if our whole existence can be reduced to the genes we have inherited. But this bio-psycho-social model is of the view that our mental health encompasses not just biological factors, but also psychological factors (thoughts, emotions, and goal directed-behaviours) and social factors (family, traditions, culture). The biopsychosocial model

is both a philosophy of clinical care and a practical clinical guide. Philosophically, it is a way of understanding how suffering, disease, and illness are affected by multiple levels of organization, from the societal to the molecular. In truth, there are many biological bases for many of our illnesses such as the functioning of the neurotransmitters, hormones, genetics etc in the development of diseases. At the practical level, it is a way of understanding the patient's subjective experience as an essential contributor to accurate diagnosis, health outcomes, and humane care (Borrell-Carrio, Suchman & Espstein, 2004). The biological factors are such as heritability, changes in neurotransmitters and endocrinological factors after the stroke disease, while the psychosocial factors include critical life events, social expectations and perceptions after the onset of the stroke disability, cognitive and learning theory-based factors. It was found that the biological, psychological and (eco-) social factors that contribute to etiopathogenesis frequently interact (i.e the effect of lesion in brain, health locus of control and disabilities can have profound effect on the outcome of patients in recovery and mortality) see fig. 2.4, fig 2.5. The bio-psycho-social model lends itself to collecting all the factors that are linked to this post-stroke depression and post-stroke anxiety etiopathogenetically and to using them for the purpose of coming out with bold statement. It thus provides a suitable basis for individually tailored therapy and also has valuable applications in the place of psychotherapeutic intervention. The model prompted a revolution in medical thinking by providing an argument and rationale that better linked medicine to science. Following the revolution in physics at the turn of the last century, science gradually moved away from previous linear, cause–effect thinking. To that point, understandably, medicine's guiding biomedical model focused only on diseases (Smith, 2002).

This biopsychosocial paradigm is the "mind–body connection", which addresses more philosophical arguments between the biopsychosocial and biomedical models, rather than their empirical exploration and clinical application. Common sense tells us that mental events and processes can influence bodily ones and vice versa. However, there are philosophical arguments against the possibility of such an interaction and these arguments have to be carefully analysed. Without a proper understanding of the role of mind and consciousness in the genesis and shaping of somatic events and processes, one cannot adequately address psychosomatic issues.

In addition to this, lay thinking about the causes or origins of good and ill health has been found to be characterized by complex considerations. Even if health is often taken for granted, and only missed when it is felt to be compromised, this does not mean that lay people lack clear ideas about the relationship between health and illness. In one of the earliest and most influential studies of lay concepts of health, Herzlich (1973) showed how, among a sample of 80 middle-class French respondents (mostly from Paris) health was linked to the connections between individuals and 'the way of life'. Health beliefs or the 'representations of health' as Herzlich called them, located the source of illness in the character of urban living, with its tendency to create stress, fatigue and nervous tension. This, it was felt, could 'facilitate' or 'release' forces that could aid the development of illness. But such forces could also 'generate' illness – that is, be more pathological in their own right – and not just exacerbate existing problems, for example, by making an infection worse.

Positive health, on the other hand, was seen to be inherent in the individual. The balance or 'equilibrium' between the healthy individual and illness could be upset by a number of features of the environment. Cancer was linked to allergies, and to the nervous strain of city life and the polluted atmosphere found there. Mental illness was

linked to the ‘restlessness’ of modern living, and heart disease to the ‘many worries which make people live in a certain state of anxiety’ (Herzlich 1973). Whilst the respondents in this study recognized that individual attributes might contribute to poor health, these attributes were never seen as both necessary and sufficient. The individual’s ‘nature’, heredity, temperament or predisposition might make the individual vulnerable, but the ‘way of life’ remained crucial to the development of poor health.

The biopsychosocial model implies that treatment of disease processes, for example post stroke psychopathology in the form of post-stroke depression and post-stroke anxiety , requires that the health care team address biological, psychological and social influences upon a patient's functioning. In a philosophical sense, the biopsychosocial model states that the workings of the body can affect the mind, and the workings of the mind can affect the body. This means both a direct interaction between mind and body as well as indirect effects through intermediate factors.

The biopsychosocial model presumes that it is important to handle the three together as a growing body of empirical literature suggests that patient perceptions of health and threat of disease, as well as barriers in a patient's social or cultural environment, appear to influence the likelihood that a patient will engage in health-promoting or treatment behaviors, such as medication taking, proper diet or nutrition, and engaging in physical activity.

The value of the biopsychosocial model has not been in the discovery of new scientific laws, as the term "new paradigm" would suggest, but rather in guiding parsimonious application of medical knowledge to the needs of each patient. Finally, the biopsychosocial approach systematically considers biological, psychological, and

social factors and their complex interactions in understanding health, illness, and health care delivery (Cohen & Brown, 2010).

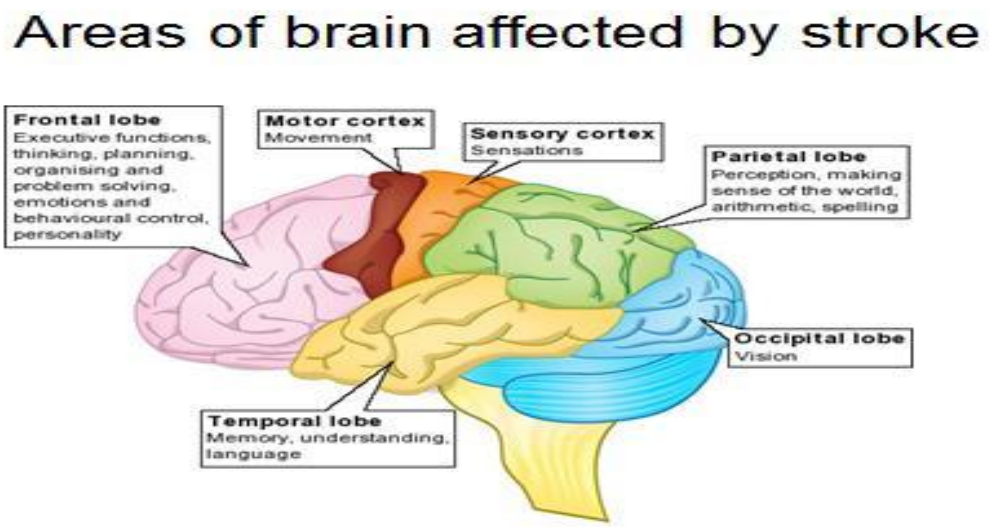


Fig: 2.4 Lobes and the major functions

Source www.brooksbroadstrokes.wordpress.com

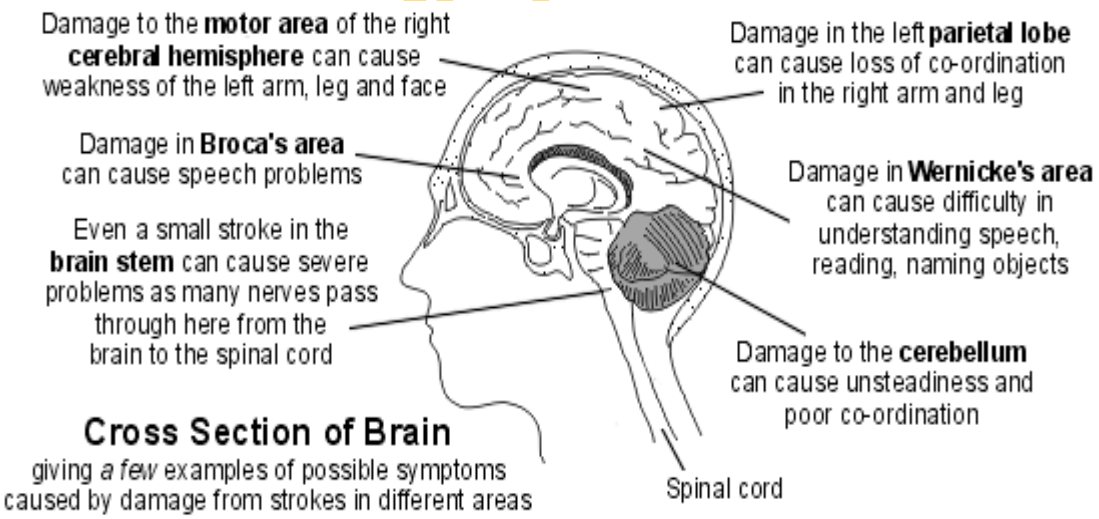


Fig: 2.5. The effect of stroke on the human brain source www.headway.org.uk

2.2.2.1 Criticism of the Bio-psychosocial model

The Bio-Psychosocial model was not unique in its inclusion of psychosocial determinants of disease, as this approach is found in many non-Western healthcare modalities, but it was unique in describing how these psychosocial considerations could be integrated scientifically. It described to the medical community how psychosocial elements could be included in human care without sacrificing the conventional scientific-empirical methodology, thus broadening the field of scientific inquiry. The first weakness is in the pluralistic treatment modalities in psychiatry of psychotropic medications, electroconvulsive therapy, and psychotherapy have arisen out of tolerance rather than theoretical integration of the BPS model. Second, the anti-psychiatry movement had been reconstituted as "critical psychiatry" rather than subsumed into a synthetic solution like the Bio-psychosocial model. Third, some think that the BPS model is losing ground altogether, as psychiatry moves increasingly towards neuropsychiatry. Finally, model since the 1980's, even in works that address etiology and integrative approaches to Psychiatry. "Models of mind have to be based in theories of mind, although one may organize the theory of mind according to the general principles of a theory of systems."(Wilber, 2003)

Although Engel described how a BPS model might function, he never described the model itself. Thus, the BPS model has no real predictive value, and in that sense, is unscientific.

2.2.2.2 Application of the Bio-psychosocial model to the study

The major thrust of this model is the notion that illnesses develop based on complex weave of physical, psychological and environmental/social issues which influence diseases. The core of which is that the every illnesses such as stroke or its

resultant psychopathology (post-stroke depression) has physical cases such as the bursting of vessels and clots to the brain, the social basis also causes part of the problem such level of social support after the cerebrovascular accident, the level of the physical disability after the stroke attack, the age of the stroke survivor etc, and also having important roles is the psychological basis such as the personality type of the survivor, the health locus of control and perceived social support. The model integrates the physiological systems (life sciences), psychological processes (thoughts, feelings, behaviours) and the social and cultural context in which people live and children grow up (see sociology and social policy). This field of study provides strong evidence to support the need for holistic care.

2.2.3. COGNITIVE THEORY OF DEPRESSION (Aaron Beck, 1967)

One of the first cognitive theories of depression was by Aaron Beck, which argues that depressed people look at the world through a negative cognitive triad: they have negative views of themselves, of the world, and of the future. People with depression commit many errors in thinking such as jumping into conclusions on the basis of very little evidence, ignoring the positive, focusing on the negative, exaggerating the negative events that support the negative cognitive triad. Depressed people may not be aware that they hold these negative views or that they make errors in thinking because usually these are automatic thoughts. Cognitive behavioural theorists suggest that depression results from maladaptive, faulty, or irrational cognitions taking the form of distorted thoughts and judgments. Depressive cognitions can be learned socially (observationally) as it is the case when children in a dysfunctional family watch their parents fail to successfully cope with stressful

experiences or traumatic events. Or, depressive cognitions can result from a lack of experiences that would facilitate the development of adaptive coping skills.

According to cognitive theory, depressed people think differently than non-depressed people, and it is this difference in thinking that causes them to become depressed. For example, depressed people tend to view themselves, their environment, and the future in a negative, pessimistic light. As a result, depressed people tend to misinterpret facts in negative ways and blame themselves for any misfortune that occurs. This negative thinking and judgment style functions as a negative bias; it makes it easy for depressed people to see situations as being much worse than they really are, and increases the risk that such people will develop depressive symptoms in response to stressful situations. Beck believed that the cognitive symptoms of depression actually precede the affective and mood symptoms of depression, rather than vice versa. According to Beck, what is central to depression are the negative thoughts, instead of hormonal changes or low rates of reinforcement as postulated by other theorists. As it is a cognitive theory, it strongly deals with the cognitive perceptions of the brain, which was different from the behavioural theories that were popular during Beck's time, thus making his theory a breakthrough in cognitive research (Allen, 2004). Cognitive theories rose to prominence in response to the early behaviourists' failure to take thoughts and feelings seriously. The cognitive movement did not reject behavioural principles; however, rather, the idea behind the cognitive movement was to integrate mental events into the behavioural framework.

A key part of Beck's Theory is not only that the subject will feel negative underlying beliefs, but also that these beliefs fall into a certain field which separates them from other disorders such as panic and anxiety disorders. For example, these include polar reasoning, selective abstraction, and overgeneralization. Such feelings

promote failure in the first and last and loss all in split seconds. Polar (dichotomous or all-or-none) reasoning is extreme, so even a slight waiver from perfection is considered a failure. Abstraction means that successes are ignored, and lost to the subject, who is left only with sadness. Overgeneralization implies one will do poorly at one thing, and assume failure in all related things. Thus, the main feelings of depression according to Beck are failure and loss. In a study done by Beck himself with Clark and Brown (1989) he looks to confirm this by studying psychiatric outpatients. He found that "the cognitive content-specificity hypothesis was strongly supported. Thoughts of loss and failure were uniquely predictive of depression, whereas cognitions of harm and danger were specifically associated with anxiety" (Clark, Beck, & Brown, 1989). This theory shows how early experiences can lead to the formation of dysfunctional beliefs, which in turn lead to negative self views, which in turn lead to depression.

According to Beck, negative thoughts generated by dysfunctional beliefs are typically the primary cause of depressive symptoms. A direct relationship occurs between the amount and severity of someone's negative thoughts and the severity of their depressive symptoms. In other words, the more negative thoughts you experience, the more depressed you will become. Also, the theory asserts that there are three main dysfunctional belief themes (or "schemas") that dominate depressed people's thinking: one – I am defective or inadequate; two – All of my experiences result in defeats or failures; and three – The future is hopeless. Together, these three themes are described as the Negative Cognitive Triad. When these beliefs are present in someone's cognition, depression is very likely to occur (if it has not already occurred). An example of the negative cognitive triad themes will help illustrate how the process of becoming depressed works. Imagine that you have just been laid off

from your work. If you are not in the grip of the negative cognitive triad, you might think that this event, while unfortunate, has more to do with the economic position of your employer than your own work performance. It might not occur to you at all to doubt yourself, or to think that this event means that you are washed up and might as well throw yourself down a well. If your thinking process was dominated by the negative cognitive triad, however, you would very likely conclude that your layoff was due to a personal failure; that you will always lose any job you might manage to get; and that your situation is hopeless. On the basis of these judgments, you will begin to feel depressed. In contrast, if you were not influenced by negative triad beliefs, you would not question your self-worth too much, and might respond to the lay off by dusting off your resume and initiating a job search.

Beyond the negative content of dysfunctional thoughts, these beliefs can also warp and shape what someone pays attention to. Beck asserted that depressed people pay selective attention to aspects of their environments that confirm what they already know and do so even when evidence to the contrary is right in front of their noses. This failure to pay attention properly is known as faulty information processing. Particular failures of information processing are very characteristic of the depressed mind. For example, depressed people will tend to demonstrate selective attention to information, which matches their negative expectations, and selective inattention to information that contradicts those expectations. Faced with a mostly positive performance review, depressed people will manage to find and focus in on the one negative comment that keeps the review from being perfect. They tend to magnify the importance and meanings placed on negative events, and minimize the importance and meaning of positive events. All of these manoeuvres, which happen quite unconsciously, function to help maintain a depressed person's core negative schemas

in the face of contradictory evidence, and allow them to remain feeling hopeless about the future even when the evidence suggests that things will get better.

Cognitive behavioral therapy is aimed at changing irrational cognitions and negative thoughts, it is considered to have a stronger effect on preventing relapse of symptoms especially because in stroke patients these are often dysfunctional, however, cognition alone doesn't explain all the feelings a stroke survivor has which include real life issues of decreasing sympathy and help over time, real physical disabilities and increasing costs of living, pre and post hospital admissions. Cognitive rehabilitation therapy takes a large chunk of cognitive behavioral therapy model especially when dealing with the impaired cognitive domain (psychological co-morbidity) such as depression in modular cognitive rehabilitation therapy.

2.2.3.1 Criticism of Cognitive theory of depression

One of the problems of the cognitive theory of depression is that it does not suit everyone and there had been situations where it was not helpful. For the cognitive theory to work effectively it requires the commitment , enthusiasm and persistent tackling of the problem at hand to have the desired result, therefore a highly de-motivated patient might remain depressed despite the best abilities of a therapist. Also it had been often argued that it places too much emphasis on the power of positive thinking, it is too superficial and simplistic, it denies the importance of the client's past, it is too technique oriented, it fails to use the therapeutic relationship to explore other important areas of a client's life which might help in the relief of symptoms, it works only eliminating symptoms, but failing to explore the underlying causes or difficulties, it ignores the role of unconscious factors, and finally, it neglects the role of feelings.

Clients who are comfortable with introspection, who readily adopt the scientific method for exploring their own psychology, and who place credence in the basic

2.2.3.2 Application of Cognitive theory of depression

The basic claim of this model is the notion that depression whether due to reaction to the stroke or due to neurotransmitter imbalance, there is a significant dysfunction of the stroke survivors' cognitions, affect, and behavior. These thoughts and behaviors then play a significant role in the path to recovery and involvement in rehabilitation of the stroke survivors. When a person is depressed after a stroke episode, he begins to think negatively about his/her loss of functioning and independence while this goes into the cycle of giving in to low mood and loss of interest in other activities which leads to loss of interest in rehabilitation and which invariably leads into a vicious cycle of depression. This is often explained using ABC model i.e. A(Activating events{Stroke}), B(Belief{I am not going to back to walking independently again}),C(Consequences{Not actively working in the physiotherapy clinic, using medication, thereby having to sit indoors}).

Modern cognitive approaches to depression and post stroke depressive symptoms have developed from a number of models and approaches to managing depression, all showing commendable efficacy to depression management. They have also shown the most logical singular treatment approach to depression and most psychological illnesses and this approach with its problem-solving, thought-court, cognitive restructuring and socratic questioning, etc emphasizes that individuals have a strong role to play in managing their mental health through managing of their thought pattern and behavior.

2.2.4. Bronfenbrenner's Ecological Theory

The ecological theory focuses on the interrractions of an individual with others and the environment. It further emphasizes that this interaction is key to complete living. Ecological systems theory is an approach to study of human development that consists of the 'scientific study of the progressive, mutual accommodation, throughout the life course, between an active, growing human being, and the changing properties of the immediate settings in which the developing person lives, as this process is affected by the relations between these settings, and by the larger contexts in which the settings are embedded'. (Bronfenbrenner, 1989).It also posits that we all have and experience diverse experiences in more than one type of environment. The environments were listed as the microsystem, the mesosystem, the exosystem, the macrosystem and the chronosystem.

- The micro system- the immediate environment in which a person is operating, such as the family, classroom, peer group, neighborhood**,** etc. this system can affect the support an individual can have over time and how an individual will manage, the perception etc about illness and life generally.
- The mesosystem - the interaction of two microsystem environments, such as the connection between a stroke survivor's home and hospital, Home system <---> Hospital system.
- The exosystem - the environment in which an individual is not directly involved, which is external to his or her experience, but nonetheless affects him or her. An example of an exosystem is the patient's spouse workplace**.** Although a stroke survivor may never have any role in the spouse's workplace, or, in fact, never even go there, the events which occur at the spouse's place of employment do affect the stroke survivor. For example, if

the spouse has a bad day at work, or is laid off, or promoted, or has to work overtime, all of these events impact the family and the stroke survivor.

- The macrosystem - the larger cultural context, including issues of cultural values and expectations. The belief of a religious or culture might be that a stroke is caused by sin or inflicted on those who God has earmarked for death which affects the psyche of a survivor even in treatment, rehabilitation and development of cognitive coping skills.
- The chronosystem - events occurring in the context of passing time**.** These events may have impact on a particular birth cohort. These could be the type of life style available at a particular time i.e. the advent of fast food joints and medication even immunizations available at a particular point in time.

Each of these systems is characterized by roles, norms (expected behavior) and relationships. For example, an individual usually acts differently within his or her own family than within a hospital ward. The person may speak more often at home, be less goal-oriented, and, almost certainly, will not sit at a bed for hours on end. Other things being equal, according to Bronfenbrenner, when the relation between different microsystems is a compatible one, development of the person progresses more smoothly. A common example of this is the relationship between hospital and work place. When role expectations are similar in both settings, e.g., try your hardest, do your own work, be on time, etc., surivours will be expected to perform better than if role expectations differ substantially from one setting to the next.

The ecological model encompasses an evolving body of theory concerned with the conditions that govern the lifelong course of human development in the actual environments in which human beings live. Two propositions specifying the defining properties of the theory are that 1. Human development takes place through processes

of progressively more complex reciprocal interaction between an active, evolving bio-psychological human organism and the persons, objects, and symbols in its immediate environment. To be effective, the interaction must occur on a fairly regular basis over extended periods of time. Such enduring forms of interaction in the immediate environment are referred to as proximal processes. e.g. learning new skills after a stroke episode, performing complex task after a sickness, patient-patient relationship, psychotherapist – client relationship. 2. The second proposition states that the form, power content, context, and direction of proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person or rehabilitating person; of the environment - both immediate and more remote – in which the processes are taking place; and the nature of the rehabilitation outcomes under considerations such as memory, cognition etc.

Furthermore, a micro system is a pattern of activities, social roles, and interpersonal relations experienced by the developing person (in this case a stroke survivor) in a given face-to-face setting with particular physical, social, and symbolic features that invite, permit, or inhibit, engagement in sustained, progressively more complex interaction with, and activity in, the immediate environment. Examples include rehabilitation centers, physiotherapy clinic, workplace etc. it is within the immediate environment of the microsystem that proximal processes operate to produce and sustain development. However, the power to do this depends on the content and structure of the microsystem. The mesosystem comprises of the linkages and processes taking place between two or more settings containing the rehabilitating survivor (e.g., the relations between home and hospital, hospital and workplace). The effects of the mesosystems processes are often greater than those attributable to socioeconomic status or ethnicity. The exosystem comprises of the linkages and

processes taking place between two or more settings, at least one of which does not contain the rehabilitating person, but which events occur that indirectly influences processes within the immediate setting in which the rehabilitating survivor lives (e.g. for a stroke survivor, the relation between the home and the caregiver's workplace; the relation between the workplace and the neighborhood peer group). The macrosystem consists of the overarching pattern of the micro-meso and exosystem characteristic of a culture or subculture, with particular reference to the belief systems, bodies of knowledge, material resources, customs, lifestyles and life course options that are embedded in each of these broader systems. This is often thought of as the societal blueprint for a particular culture or subculture Chronosystems encompasses change or consistency over time not only in the characteristics of the person but also of the environment in which that person lives (e.g. changes over the life course in family structure, socioeconomic status, level of academic status, employment or occupation). All these systems work together to govern the lifelong course of human development in the actual environments in which humans beings live.

2.2.4.1 Criticism of Ecological theory

The ecological theory is generally well received among scholars and most criticism centers around the difficulty to empirically test the theory and model. Furthermore the model is very broad that it becomes challenging to intervene at any given level of the systems. It also has the tendency to view people as objects while in actual fact the systems among people are not also linear and there is a constant interplay in the social life in which very small changes can alter the whole process. Another important flaw in the theory is the tension that ensures in relationships

whether parent-child, therapist – client etc. Finally it gives very little attention to the biological constituent of our development.

2.2.4.2 Application of Ecological theory

The major thrust of the theory is hinged on the notion that every individual has exists within a sphere of influence with environmental systems. These includes community, neighbors, peers and friends, the media, religion and culture, all these interact to affect how a person is rehabilitated back into functioning, how the person is affected by life situations and how the survivor reintegrates back to the society. The theory in this work bridges the gap between the stroke survivor and the other systems in his/her rehabilitation. The stroke survivor will try his best to control the situation to his best interest due to the use of the available resources through the use of the systems. To prevent illnesses or be rehabilitated , a stroke survivor should avoid an environment in which he/she may be more susceptible to having a recurrent attack or where their prior illness can be heightened. This also includes possibly removing himself/herself from a potentially dangerous environment or avoiding an unhealthy habit which exacerbated the illness or reduce effective rehabilitation. On the other hand, some environments are particularly conducive to health benefits. Surrounding oneself with physically fit people will potentially act as a motivator to become more active, diet, or work out at the gym. The government banning trans fat may have a positive top-down effect on the health of all individuals in that state or country.This conservation includes maintaining wholeness by being forward thinking and removing possible causes of his stroke such as smoking, drinking, etc (all unhealthy life styles). The health care giver/psychologist is the one to assess the patient's capability to participate with the care for example, the clinical psychologist would

assess a stroke patient to perform active range of pleasurable scheduling or exercises, and if he/she discovers that the patient can do it, it is his/her duty to preserve the energy of the patient, as well as his integrity because independence fosters self worth. If the patient is encouraged to do activities for his recovery, his self esteem will be boosted thus paving way for self worth attainment. Likewise with his support system, if they are given the chance to help the patient in his recovery, his other systems are uplifted.

2.2.5 RUMINATIVE RESPONSE STYLES THEORY

Ruminative response involves repetitively focusing on the fact that one is depressed; on one's symptoms of depression; and on the causes, meanings, and consequences of depressive symptoms (Nolen-Hoeksema, 1991). This focuses more on the process of thinking, rather than the content of thinking as a contributor to depression. Some individual when sad, unhappy, blue or upset focuses more intently on how they feel – their symptoms of fatigue, poor concentration and their sadness and hopelessness – and can identify many possible causes of these symptoms. They do not attempt to do anything about the causes of these feelings, however, instead of any positive action they just continue to ruminate about their depression. This is where the problem solving therapy comes in, starting from process of thinking and what to actually do about this thinking pattern, bringing out the problems arising which are real issues then find appropriate measures to solve these problems. A patient with recent stroke with limited number of care givers/who had been outrageously independent, now restricted to help in moving/doing simple things round the house instead of ruminative response to the stroke will be thought appropriate problem solving methods which invariably reduces the post-stroke depression.

To date, Nolen-Hoeksema and her colleagues have garnered strong support for her model across a variety of study designs with nonclinical samples. In an early test, Morrow and Nolen-Hoeksema (1990) found that, following depressive mood induction, individuals who were assigned to a physically active, distracting, task exhibited the greatest alleviation of dysphoric mood. In contrast, persons who were assigned to a physically passive , ruminative task remained the most dysphoric. Similar results were found with naturally occurring nonclinical dysphoria (Nolen-Hoeksema & Morrow, 1993). To examine characteristic or typical levels of rumination, Nolen-Hoeksema and Morrow (1991) developed a self-report measure of response style. This questionnaire asks participants to report the types of thoughts and behaviours that they typically engage in when feeling dysphoric. In prospective studies with nonclinical samples, ruminative response styles have been found to predict higher levels of dysphoria over time, even after statistically controlling for the severity of initial dysphoria (Nolan, Roberts, & Gotlib, in press; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, & Larson, 1994). Further, in another study based on 30 consecutive daily measurements of mood and responses to those moods, Nolen-Hoeksema, Morrow, and Fredrickson (1993) found that rumination predicted the duration of dysphoria. In this study, individuals tended to be consistent in their responses to dysphoric mood over time, suggesting that ruminative response style is a trait-like characteristic of individuals who are vulnerable to prolonged periods of dysphoric affect.

2.2.5.1 Criticism of Ruminative response styles theory

The basic assertions of Response Style Theory have garnered impressive empirical support, despite this support; response style theory is not free from criticism. For example, the descriptions of rumination and distraction border on caricatures of gender role stereotypes. Again, the theory places emphasis on gender roles and ruminative styles while downplaying the cultural and societal emphasis and coping skills available to people. Also, the response styles are self reported which might be flawed. Furthermore, there had been criticism of the close resemblance with the cognitive theory of beck and many had touted has a modified cognitive theory of depression. Finally, this cannot explain every form of depression.

2.2.5.2 Application of Ruminative response styles theory

This theory tries to explain the way thoughts and the responses to these thoughts affect our mood after an illness such as stroke Nolen-Hoeksema (1998) proposed that the individual such as stroke survivor focuses on bad feelings and experiences from the past, whereas there is little or nothing the survivor can do to change the event of the past. Thus, the focus on thoughts such as 'I have been an alcoholic who does not heed my doctor's warning', 'I did not stop my smoking on time', 'I did not go to the hospital even after consistent weakness or chest pain' etc increases a stroke survivors ruminative response style of self blame, grieving about loss of health and function, anger at family members who had not done seemingly enough to help overcome or notice signs which could have prevented the stroke accident. This response style to past event such as the stroke accident brings failure to progress towards satisfactory health benefit activities and goals such as interest in rehabilitation, increase functioning, etc. thereby making the stroke survivor to focus

more on the depressive symptoms and stroke symptoms such as paralysis, slurred speech etc, the possible causes and thereby aggravating the post-stroke depression.

2.2.6. HEALTH BELIEF MODEL THEORY

The Health Belief Model (HBM) was developed by Hochbaum, Rosenstock, and Kegels (1958) for understanding health related behaviour. The Health Belief Model provides a theoretical framework for considering the determinants of protection (Health seeking behaviour) against full blown stroke. Implicit in the model is a requirement to understand healthy life style practices as well as the barriers to their being carried out. It was to explain change and maintenance of health – related behaviour once an evaluation of personal vulnerability and perceived severity of an illness was taken into account (Janz, Champion & Strecher, 2002). According to Janz et al. (2002) an individual will make specific effort in modifying behaviour when (s) he regards the illness as a serious threat, which could result in negative consequences if not attended to. While acknowledging the severity of threat, the person must also believe that the options to reduce the risk of illness are feasible and beneficial, with few associated costs.

Several versions of the health belief model have appeared. The one that attracted the most attention and generated the most research is by (Becker & Rosenstock, 1984). This model assumes that beliefs are important contributors to health-seeking behaviours. It includes four beliefs that should combine to predict health –related behaviours:

1) Perceived susceptibility to disease or disability

2) Perceived severity of the disease or disability

3) Perceived benefits of health – enhancing behaviours

4) Perceived barriers to health- enhancing behaviours, including financial costs

Each of these factors play a part in a person liable to stroke's actions or decision's to seek assistance after first diagnosis. At first, patient might not believe that his injury was serious or that he was vulnerable to disability. Thus might see very little benefit to see his physician- an action that would have taken him from his source of income, etc. However, health belief model had been applied to Nigerian populations and its stated that it is possible for someone to feel highly susceptible to a health problem but his/her willingness to seek help constitute an important factor, the action an individual will take depends on the perceived effects and consequences of such problems (Jegede, 1995, 1998). The HBM views human beings from five dimension (Jegede, 1998) as follows:

(a) biological, that is emotional effects, stature etc;

(b) interactional system, that is, man's relation with others;

(c) phenomenological system – this enables man to perceive the interplay of different parts of his body, enables man to define and monitor behaviour of his/her health as well as recognize deviations from what he has come to regard as the normal functioning of his/her body;

(d) Man possesses experiential capacity, i.e. man lives by experience or historical antecedents and

(e) Man operates within a socio-physical environment.

Therefore, in order to be able to predict disease episode and promote prevention, Jegede (1998) has reformulated the HBM base on data collected on use of immunization in Nigeria as follows: using Weberian social action theory:

- people will perceive illness as undesirable;
- they will perceive themselves as vulnerable to disease;

- they will perceive disease episode as severe;
- they will act upon their experience;
- they will consider both personal and social significance of disease;
- they will respond to awareness programmes of prevention;
- they will choose to use modern medical care;
- they will take into consideration the benefits of using modern medical care;
- they will evaluate the potential barriers associated with proposed action of using the modern health care and
- they will make rational choice of using modern health care services.

In order to make rational decisions; four stages must be fulfilled, which are:

1. They must be exposed and have access to modern health care service;
2. They must evaluate the messages received through awareness programme;
3. They must take definite actions about whether they will use modern health care services or not taking into consideration the advantages and disadvantages as well as potential barriers of using it and
4. They must act upon the decision they have taken (Jegede, 1998). However, the most important thing is the "end" and the "means" of achieving the end.

Again, corresponding with common sense and when individuals believe they are susceptible to a severe illness and can benefit from their ability to overcome barriers to good health, it is expected that people will be guided by self interest and seek health care. Common sense, however, does not always predict health- related behaviours. Research on the health belief model has been extensive, but results of that research generally suggest that a health belief model that includes only susceptibility, severity, benefits, and barriers does not predict health-related behaviours as well as models that include such additional variables as perceived

health risks, optimism, personal control, ethnic background and having a regular place to go for healthcare. Overtime, this original model was extended to include variables that test what prompts people to engage in healthy behaviour, their level of confidence in performing these behaviours and other variables that may influence behaviour change (i.e. demographic, structural variables and self efficacy). HBM is comprised of six key components; these are applied to health protective behaviours:

Perceived susceptibility – People believe they can get strokes or cardiovascular disease, i.e. People who had been having family history, diagnosed with high blood pressure, secondary hypertension or diabetes because of their health status believe they are susceptible to stroke.

Perceived Severity - People believing that the consequences of getting stroke are significant enough to avoid i.e. the knowledge of the fact that stroke has no cure and there is the loss of ability to perform previous tasks – relying on others to do some basic functions give people at risk the belief that the risk is not worth the resulting consequence.

Perceived benefit – People believing that the recommended action of using dietary regime, exercise, reduction of stress and following drug regime would protect them from stroke, that is, even if there is a continued influence of the disease in their system they can still protect themselves through the use of these activities.

Perceived barriers – Diagnosed people with cardiovascular diseases will identify personal barriers to following the health promoting behaviours (i.e. embarrassment in doing personal exercises, difficulty in following drug regime and forgoing previously enjoyed dietary habits or meals) and explore ways of reduction of level of embarrassment or non- compliance through practice and social skills training.

Cues to action – Liable adults receives reminder cues for action i.e. hand bands with the messages such as heart band. When people develop a perception about their health there usually exists a trigger that turns this into action. From a communication viewpoint uncovering what triggered a person into attention is very important.

So many things could serve as cues to prompt action such as the media, a relative, an overheard conversation, arm band – the possible triggers may be quite varied. The trigger may increase an individual's perception of susceptibility to a stroke, understanding of its seriousness, increased benefits, decreased disadvantages and barriers, increase motivation to change, or convince the patient that they may in fact be able to make any required changes themselves.

Self Efficacy – People receive training in reducing and maintain health promoting behaviours i.e. maintain health promoting eating habits correctly. Self-efficacy is a term used to describe how a person views their own ability to carry out the particular action of protection of himself. This includes a person's perception on how likely they are to change particular risky behaviours (alcohol, cigarette, eating of high fat). For example, a person may well realise that if he were to continue having the meals he eats before and other unhealthy lifestyles that he will have stroke, and be debilitated from it i.e. He has spoken with his Doctor about this many times or might have heard this from the media adverts and has been offered solution through prevention by healthy eating style or engagement in exercise program. He just thinks that he will never be able to stop eating his choice meals which are high in calories or lipids or that it's not just easy, so why bother seeking/trying to stop. A perception of low self-efficacy is the barrier to taking action in this case.

In all, the HBM postulates that a change on one's belief about health may cause a change in one's health behaviours "modifying people's health beliefs might

cause them to modify unsafe health behaviours," which is how this model is relevant to protection from developing stroke and prevention (Steers, Elliott, Nemiro. Ditman & Oskamp, 1996).

2.2.6.1 Criticism of Health belief Model

The health belief model research till date do have only part of its components incorporated into studies, therefore it's difficult to ascertain its usefulness as a whole despite its popularity. Again, the model focuses so much on the psychological dimensions of health promotions that it does not consider other important areas which affect people such as socioeconomic factors, opportunities available, environment which are equally important in health behaviors. Finally, the health belief failed in incorporating some psychological attributes or influences which affect health promotions and behaviors such as peer influence and the norm of the individual's environment.

2.2.6.2 Application of Health belief Model

The Health Belief Model (HBM) is one of the most widely used conceptual frameworks for understanding health behaviour. The model has been used with great success for more than a half century to promote medical compliance, greater condom use, seat belt use and health screening use. It is based on the understanding that a stroke survivor will take a health-related action (i.e. follow health promoting behaviour) if that person:

(a) Feels that a negative health condition (i.e. stroke/ post- stroke depression) can be avoided, through specific actions and complicated by his/her own specific inactions.

(b) Has a positive health mindset/ thought pattern about his/her abilities in taking actions about his illness (i.e. eating different dietary regime and exercise and drug compliance can prevent stroke),that there is something which he /she can do to prevent themselves from such disease; and believes that he/she can successfully take a recommended health action. That is, he/she can eat the prescribed diets comfortably and with confidence.

2.3 REVIEW OF EMPIRICAL RELATED STUDIES

Post-stroke depression following stroke are common. Cross-sectional studies of stroke survivors have demonstrated that about one-third of patients develop acute PSD and more than half suffer depression at some later point in their lives. PSD is strongly associated with a range of adverse clinical outcomes including increased length of hospital stay, higher risk of dependency, increased degree of neurological impairment, and increased patient mortality (Hayhow, Brockman & Starkstein, 2014). Estimates of the frequency range from 25% to 79 %,(Kneebone, & Dunmore, 2000) with most studies indicating the rate being approximately 30%. Anxiety disorders are also common with stroke, with prevalence rates ranging from 14% to 28% for stroke survivors (Sagen, Vik & Moum, 2009). Anxiety is especially likely to be co-morbid with depression, and treatment of depression may in many instances also address anxiety symptoms (Schneider & Wong 2011). Variation in prevalence appears to be the result of differing methods of assessment, classification, and screening instruments used. However, the consistent finding is that many people have low mood, worry and fear, which may require treatment. Few studies have considered the use of psychological interventions in the treatment of depression following stroke (Lincoln & Flannaghan, 2002).

Many people who survive a subarachnoid hemorrhage stroke have a poor quality of life due to anxiety, depression and fatigue, research also found that 32% of the survivors reported anxiety, 23% reported depression, and 67% reported fatigue. In the analysis of depression, anxiety and fatigue in stroke survivors, there was found a strong correlation with a passive coping style and neuroticism, with a psychological intervention needed to encourage them to be more independent (Visser-Meily, 2010). Clinically significant anxiety is common in ischemic stroke patients and frequently co-occurs with depression, and may interfere with rehabilitation.

2.3.1. Location of Brain lesion and Post-stroke depression

Localization of brain damage brings with it specific actions to different parts of the body, left brain damage problems are seen on the right side of the body and also including but not limited to understanding and use of language (listening, reading, speaking and writing), memory for spoken and written messages, detailed analysis of information, controls the right side of the body. Relationship between post-stroke depression and lesion location has perhaps been the most controversial in the area of research in the field of post-stroke mood disorder. Although establishing an association between specific clinical symptoms and lesion location is one of the fundamental goals of clinical practice in neurology. The first study to report a significant correlation was by Robinson & Szetela (1981) based on location of brain lesion by computed tomography, there was significant correlation between PSD and the distance of the anterior border of the lesion from the frontal pole. A meta- analysis by Narushima et al. (2003) found eight independent studies of severity of post-stroke depression and proximity of the stroke lesion to the right or left frontal pole done within the first six months following stroke (Cited in Yudofsky & Hales, 2010).

Another aspect of the effect of the lesion is the experience of emotion. It has been reported that patients with right hemisphere disease appear to be euphoric or indifferent, while several studies have suggested that left hemisphere lesions are associated with depression. The depressive syndrome is usually seen in non fluent aphasics with lesions in the anterior regions of the frontal lobe. It can be seen in patients with subcortical injury. The severity of the depression seems to increase with proximity to the frontal pole (Starkstein, Robinson, & Price, 1987 in (Butler & Satz, 1999). More studies have suggested that right hemisphere patients also experience a high level of depression, but it goes undetected because of their difficulty with emotional expression (House, Dennis, Warlow, Hawton, & Molyneux, 1990 cited in Butler & Satz, 1999). It is well known by neuropsychologists that communication deficits can result from damage to either left or right cerebral hemispheres. Communication deficits resulting from damage from the dominate hemisphere (usually left hemisphere) are generally more obvious and may involve both receptive and expressive language skills. Many clients, following brain dysfunction have difficulty with double negatives or statements which involve inverted commands, such as "before pressing letter 'Q' press the letter 'M' " (Bracy, 1994) in (Butler & Satz, 1999). Paralysis is one of the most common disabilities resulting from stroke. The paralysis is usually on the side of the body opposite the side of the brain damaged by stroke, and may affect the face, an arm, a leg, or the entire side of the body. This one-sided paralysis is called hemiplegia (one-sided weakness is called hemiparesis). Stroke patients with hemiparesis or hemiplegia may have difficulty with everyday activities such as walking or grasping objects. Some stroke patients have problems with swallowing, called dysphagia, due to damage to the part of the brain that controls the muscles for swallowing. Damage to a lower part of the brain, the cerebellum, can

affect the body's ability to coordinate movement, a disability called ataxia, leading to problems with body posture, walking, and balance (NINDS, 2010).

In a study, Oladiji et al., (2009), the relationship between stroke laterality and post-stroke depression was highlighted with post-stroke depression more likely with patients who have their stroke lesion over the right hemisphere, however, this was inconsistent with studies such as Rao, 2001; Singh et al, 1998. Also, a study by Kadojic, Vladetić, Čandrlić, Kadojić, Dikanović & Trkanjec (2005) in which all of the patients hemispheric lateralisation of the brain lesion was registered with CT scan discovered that with hemispheric lateralisation of brain lesion, emotional disorders are more expressed in the right hemisphere lesion than in the left but noted the differences of their findings of other preceding researches and stated that the findings was not statistically significant, Many authors supported this, claiming that left hemisphere lesions (mostly left frontal cortex and left basal ganglia) result with depression, while right hemisphere lesion result with secondary mania. Key research in the area has been conducted at John Hopkins i.e. by Robinson et al., (1981; 2003; 2007), who have almost consistently found higher frequency of depression in patients with left-anterior cerebral lesion (Lipsey et al. 1986, Robinson and Szetelc, 1981). Many others confirm that, while a few studies report a higher rate of depression in right hemi sphere lesions (Dam et al. 1989, Feibel and Springer, 1982) and the some did not found any inter-hemispheric differences at all. In the study by Oladiji et al., (2009), no inter-hemispheric differences were found on the scale of depression. Studies have found that the rate of depression in post TBI (Traumatic Brain Injury) is nearly eight times higher than the general population's rate (53.1 versus 6.7 percent) (Bombardier et al., 2010) and the vast majority of this special population is not treated nor followed –up even when appropriate treatment opportunities are available.

Furthermore, (Visser-Keizer, 2002) recognizes greater unawareness in the right hemisphere patient correlated significantly with more severe neglect. On the other hand, greater disturbances in mood of left hemisphere patients and of partners in both hemisphere groups correlated with greater total disagreement between patients and partners.

Pathophysiological mechanisms of post-stroke depression are not known, however, many studies have examined the positive role that lesion location may play in this scenario. One group Robison et al. (1984) reported that patients with left anterior lesions (left frontal cortex or left basal ganglia lesions) have the highest frequency of depression, and the severity of depression correlated directly with proximity of the anterior border of the lesion to the frontal pole. These findings notwithstanding, have created controversy in the literature on post-stroke depression with some reporting similar outcomes, Robinsom et al.(1986); Burvil et al.(1995) and some finding no difference between left and right frontal injury in the frequency of post-stroke depression, Herrmann et al. (1995), Astrom et al. (1993). One particular longitudinal study conducted on Post-stroke depression and lesion location revealed that conflicts often found among interstudy differences can be attributed in large part to the time when patients were examined following stroke, House, Dennis & Warlow (1990). The relationship between major depression and lesions of the left fontal and left basal ganglia, have been found only during the acute phase of the stroke (between 2weeks and 2 months), from the two studies it was noted that between 30 and 60days found no association between the depression and left hemispheric lesions, while majorities of studies were conducted at three months following stroke when the frequency of depression of depression of right hemispheric stroke was no different than that following hemispheric stroke (House et al.,1990).

Although the left frontal and basal gangalia lesions have been associated with depression in acute stroke, right frontal and parietal lesions may be implicated with depression during the subacute phase. During the time of recovery, it is well known that lateralized biochemical and neurophysiological changes can occur in direct response to brain injury. Laboratory studies performed on rats by Schwartz et al. (1993) and receptor imaging on humans using positron emission tomography have indicated that lesions occurring in the right hemisphere produce a more significant decrease in norepinephrine and serotonin than those with left hemispheric lesions. Speculation by some researcher as to these findings is that a right hemispheric change may lead to a compensatory re-uptake of serotonin receptors in the parietal and temporal cortex regions, thus delaying the onset of depressive symptoms. Conversely, biogenic amine depletion is weakened following a left frontal lesion but is uncompensated, therefore leading to the acute onset symptoms of depression. Localization of brain damage brings with it specific actions to different parts of the body, left brain damage problems are seen on the right side of the body and also including but not limited to understanding and use of language (listening, reading, speaking and writing), memory for spoken and written messages, detailed analysis of information, controls the right side of the body.

In a study by Paradiso & Robinson (1998), women were twice as frequent diagnosed with major depression as men suggesting a different nature of post-stroke depression in men and women though this was not validated by other further studies. Over the last 15 years, (Starkstein et al., 1987, Robinson et al., 1984) and others have shown that major depression following brain injury is more frequent after left anterior lesions. The results of these studies may help to explain some of the inconsistent past

results (House et al., 1990; Agrell et al., 1994; Schwartz et al., 1993) with regard to post-stroke depression and lesion location.

Finally, there was a clear relation between proximity of the lesion to the left frontal pole and depression, especially in the first few months after stroke, Narushima et al. (2003). The results of this second meta-analysis were given further weight by a Finnish study published earlier Vataja, Leppavuari & Pahjavaara, (2004). The study also found that a brain infarct affecting the pallidum was a strong predictive factor for post-stroke depression. This finding also fits with case reports of dysphoria in relation to insertion of deep brain stimulating electrodes in the same area. Apart from the importance that lesion location may play in determining the degree of post-stroke depression in stroke patients, other factors must also be considered as important risk factors such as physical disability, perceived level of social support, number of cerebrovascular accidents and health related quality of life.

2.3.2 Physical disability and Post-stroke depression

The greater the impairment in activities of daily living, the higher the likelihood of post-stroke depression in stroke patients is increased. Townsend et al.(2010) reported that the acceptance of disability has an association with depression following stroke and its ability to predict depression at follow-up. One-third of participants were found to have depression at one month and 30% at nine months. Non-acceptance of disability remained associated with post-stroke depression and current disability at one month and nine month. The qualitative findings illustrated a self –reproachful element to non-acceptance of disability. The ramifications of post-stroke depression are enormous in terms of patient recovery as well as societal and family implications. A study by Angeleri, Angeleri & Foschi, (1993) suggest that

when all factors influencing physical recovery (e.g. lesion size and time in physical therapy(while time in therapy implicate level of disability))are taken into account, depression has an independent effect by inhibiting recovery in most activities of daily living during the first two years following stroke. Willet et al. (2010) in their study concluded that depressed mood after stroke is associated with disability but not mortality after stroke. It is estimated that stroke currently disables over 4 million Americans, Sirven &Malamut (2010) and this is expected to be higher in Nigeria due to our higher prevalence rate. The financial, social, and familial impact is staggering, because it impacts significantly the ability to return to work. Physical disabilities correlate with the risk of development of depression. According, to Chau, Thompson, Chang,Woo, Twinn, Cheung & Kwok (2010), there has been increasing recognition of the influence of depression on post-stroke on recovery, with reported associations with other factors such as physical outcomes. In their study, there was consistent positive association between post-stroke depression with physical disability. Also, in a study by Lenze et al. (2001), depression was associated with excess disability especially in the geriatric population; studies showed post-stroke depression to be a risk factor for disability and quite not logical physical disability improves with treatment for depression in various literature and prospectus research. Whyte & Mulsant (2002) agreed that depression is a common occurrence in stroke according to their study of systematic review of literature in several aspects of stroke illness, prevalence, etiology and current understanding of biological treatment of post-stroke depression, concluding that post-stroke depression is multifactorial in origin with severity of physical disability a strong point. Hackett & Anderson (2005), in their study stated that although there is uncertainty over the etiology and risk factors in post-stroke depression, which complicates management knowledge of the predictors

of depression associated with stroke may allow for the better targeting therapy, both prevention and treatment. After systematic review of literature (published, non-experimental and rehabilitation based stroke studies until 2004), physical disability and stroke severity were consistently associated with post- stroke depression.

Depressed stroke patients are less active in their rehabilitation and show greater impairments in their activities of daily living than patients who are not depressed but who have the same severity of stroke (Ramasubbu et al., 1998). Early diagnosis of post-stroke depression is essential as there is evidence to suggest that effective treatment of the depression enhances recovery from impaired activities (Robinson, 2003). This treatment, however, is frequently not forthcoming. The 2006 Healthcare Commission report (United Kingdom) on stroke noted that following discharge from hospital only 29% of stroke patients with emotional problems (such as confusion, depression and crying) taking part in their survey stated that they got 'enough' help from the NHS. This number decreased to 13% in patients treated outside dedicated stroke units.

In a study by Paradiso & Robinson (1998), post-stroke depression was associated with greater impairment in activities of daily and social functioning; on the other hand, depression in males might be associated with non-biological factors such as severity of physical and psychosocial impairment, suggesting a different nature of post-stroke depression in men and women though this was not validated by other further studies. So among males, those with the greatest physical impairment were the most depressed. Although, depression occur in both males and females and with it was associated impaired social functioning and greater cognitive impairment. Again, Morris, Robinson & Raphael (1991) examining a hospital rehabilitation population found men with post-stroke depression being associated with greater physical

disability; they found a greater frequency of depression among men with greater physical disability than among men with less severe impairment. Other studies reported an association of depression and functional impairment, but no gender-based analyses were performed. Paradiso & Robinson (1998) findings also confirm those of Morris et al., (1991) who reported that depressed men tend to perceive their social support as less adequate compared with non-depressed men.

Up to half of stroke survivors depend entirely on their family members for assistance with activities of daily living. The most common causes for dependency are sphincter incontinence, inability to walk, inability to transfer, inability to feed and difficulty in dressing.

2.3.3. Number of Cerebrovascular Accidents and Post-stroke Depression

Recurrent stroke is a major contributor to stroke disability and death, with the risk of severe disability or death from stroke increasing with each stroke recurrence bringing with it post-stroke depression. The risk of a recurrent stroke is greatest right after a stroke, with the risk decreasing with time. After experiencing a stroke, survivors and their families usually concentrate their efforts on rehabilitation and recovery. However, preventing another (or recurring) stroke from happening is also a critical consideration. Of the estimated 780,000 Americans who experience a stroke each year, 5 to 14 percent will have an additional stroke within one year. Within the next five years, stroke will recur in 24 percent of women and 42 percent of men (NSA, 2010). Other relevant aspects of the patho-physiology of depression are the relationship between multiple stroke and their cumulative effects. One group, Agrell et al. (1994) found that subsequent strokes illicit symptoms associated with earlier stroke in patients with multiple lesions. Furthermore, among patients with old lesions

of the left frontal cortex or left basal ganglia, a new lesion in any location was often associated with depression. It has been stated that right frontal and parietal cortices are hemispheric sites where stroke lesions are most strongly associated with depression, (Schwartz et al., 1993).

However, in a study Burvill et al. (1995), there were no significant differences between the sexes or between patients with first-ever and recurrent strokes in their level of post-stroke depression though it was a symptom in both categories of stroke patients. Furthermore, recurrent stroke was a significant factor associated with shorter hospital stay in our study as compared to first-time stroke patients. This is counter-intuitive as one would expect patients with recurrent strokes to be more functionally impaired and hence stay longer for rehabilitation. Saxena, Koh, Ng, Fong & Yong (2007). Although depression is common after stroke, there is uncertainty over its etiology and risk factors, which complicates management, a systematic review of all published, non experimental population, hospital, and rehabilitation-based stroke studies (to June 2004) with prospective, consecutive patient recruitment undertaken to identify variables associated with depressive symptoms (or "illness") after stroke, from these data were that physical disability, stroke severity/recurrence and cognitive impairment were consistently associated with post-stroke depression Hackett & Anderson, (2005). However, the paucity of well-designed studies of sufficient size was noted in their study.

In a study by Pendlebury & Rothwell (2009), after study methods and case mix are taken into account, reported estimates of the prevalence of dementia are consistent: 10% of patients had dementia before first stroke, 10% developed new dementia soon after first stroke, and more than a third had dementia after recurrent stroke. The strong association of post-stroke dementia with multiple strokes and the

prognostic value of other stroke characteristics highlight the central causal role of stroke itself as opposed to the underlying vascular risk factors and, thus, the likely effect of optimum acute stroke care and secondary prevention in reducing the burden of dementia.

2.3.4 Concordance and prior illness and Post-stroke depression

Many of the stroke survivors do have many physical illness that are been treated before their stroke attack. There are many postulations that these prior illnesses could have an effect on the development of post-stroke depression. These seem logical because many of the survivors do have illnesses such as high blood pressure, diabetics, long years of smoking, long history of alcohol use and misuse. A study by Burvil, Johnson, Jamrozik and Stewart-Wynne, (1997), found no significant association between pre-stroke physical illness and post-stroke depression, Also, a more recent systematic review of studies by De Ryck, Brouns, Geurden, Elseviers, Deyn and Engelborghs (2014), though found inconsistencies in results, however, could see that over the last two decades a large controversy exists concerning the risk factors for the development of post-stroke depression and none of this is from sub Saharan Africa, which underlines the need for more synchronized studies, despite the belief that some lifestyle increase feelings of guilt and other negative ruminations which aggravate post-stroke depression. Again, though very few research had been done on concordance and post-stroke depression but anyone can have a post – stroke depression no matter the hand been used whether affected by the stroke attack or not. However, it is expected to have greater meaning and significance to a person who losses more ability of independence to the loss of limbs that aid independence.

2.3.5 Gender and Post-stroke depression

In stroke and other medical illnesses, secondary depression may be associated with different factors in women than in men. Gender differences in the frequency of affective disorders are well established in the psychiatric literature (Weissman and Olfson, 1995). The frequency of the occurrence of unipolar depression in women had been suggested to be due to biological differences, physiological differences in wiring, gender based differences in the brain or organization which might have contributed to differences in its frequency has found by studies such as Borod (1992) which reported that facial recognition of emotion is more bilaterally distributed in females than males; Gur, Mozley, Mozley (1995) also showed that gender differences in resting glucose metabolism in the limbic system may be the basis of some cognitive and emotional differences between sexes; and Shaywitz, Shaywitz, Pugh (1995) found that cerebral organization of language was more bilateral in its cerebral localization in females than males. One might expect, given these gender-based differences in brain organization, that brain injury would affect men and women differently. A common psychopathological manifestation after stroke is mood disorder. Mood disorders following stroke have been proposed as a model to study affective illness in general. If women are biologically more vulnerable to developing a depressive disorder, one might expect that a precipitating factor common to men and women (such as a cerebrovascular accident) would provoke more depression in females than males. One would also predict post-stroke depression to be associated with clinical variables indicating a greater biological predisposition in females. On the other hand, depression in males might be associated with non-biological factors such as severity of physical and psychosocial impairment.

Morris, Robinson and Raphael (1991) examined a stroke population in a rehabilitation hospital, found that among men depression was associated with greater physical disability. Depressed males also tended to perceive their social support as less adequate compared with non-depressed men (Morris, Robinson, Raphael, 1995). This association of depression with impairment may also apply to other medically ill populations; in patients with myocardial infarction, who are predominantly males, depression was associated with severity of medical illnesses (Schleifer, Macari-Hinson and Coyle, 1989) and social factors (Travella, Forresterand Schultz et.al., 1994). Finally, in a study by Paradiso and Robinson, (1998), they discovered that major depressive disorder in the acute post-stroke period is more frequent in females (at least within the type of population studied in Baltimore, USA) than males. In addition, post-stroke depression has different correlates and predictors in males compared with females. This result may be the effect of psychosocial factors, different biological predisposition, or both.

2.3.6 Perceived Social Support and Post-stroke depression.

A large and consistent body of evidence involving both community and patient populations has demonstrated the beneficial effects of supportive social relationships on health. Perceived social support was conceptualized as the perception that one is loved, valued, and able to count on others for support if needed. Lack of social support seems to exacerbate post stroke functional and cognitive impairment and may increase the risk of depression and anxiety especially in the older subjects. The time course of depression and anxiety after stroke is highly variable. Overall, patients with post stroke psychopathology especially depression face a greater mortality during the next few years after stroke.

Depressed males also tend to perceive their social support as less adequate compared with non depressed men. Paradiso & Robinson (1998) findings also confirm those of Morris et al. (1994) who reported that depressed men tend to perceive their social support as less adequate compared with non depressed men. Åström et al.(1992), showed that "living alone" was associated with depression at initial evaluation and anxiety for up to 2 years after first accident. The association of social impairment with depression in males may apply to other medically ill populations. In a sample composed predominantly of men with traumatic brain injury, we found that poor social functioning was the clinical variable that was most consistently associated with major depression throughout 1-year follow-up, Padisso & Robinson (1998). When considered together, social factors after stroke (living alone, place of residence, social support, and social isolation) were also consistently associated with depression. It is likely that depression reduces the desire and capacity to participate in rehabilitation, and affected people are less inclined to socialize (socialization is thought to be protective of mood disorders, Alexopoulos, Buckwalter, Olin, Martinez, Wainscott, Krinshnan, (2002) and low social support was associated with depression in 4 of 4 studies in this review). Other social factors after stroke, such as place of residence (especially living alone or in an institution), also warrant additional attention. Social isolation may be complicated by the stigma associated with acknowledging a mental health problem, with some people "masking" symptoms so that their family and doctor are unaware of any problems.

Psychological consequences of stroke are important determinants of health-related quality of life. As many as one-third of individuals with stroke will experience post-stroke depression; however, perceived social support may be protective in terms of both onset and duration of depressed mood. Improvement of available social

support could be an important strategy in reducing or preventing psychiatric distress and warding off post-stroke psychopathology. Depression and social isolation may put people at a greater risk of adverse health behaviours, such as poor adherence to medications and increased alcohol and drug intake. (Weissman, Bland, Canino, Faravelli, Greenwald, et al, 1996; Kessler, Berglund et al, 2003). In turn, loss of physical ability and decreased cognitive function after stroke may also lead to depression.

Despite growing information, questions still surround various aspects of post–stroke depression (PSD). The Italian multicenter observational study (Destro) conducted by Paolucci, Gandolfo, Provinciali, Torta, Toso (2005) was designed to help clarify in a large sample the frequency and clinical impact of post-stroke depression which discovered that risk factors for post-stroke depression were previous stroke among others. Psychological consequences of stroke are important determinants of health-related quality of life. As many as one-third of individuals with stroke will experience post-stroke depression; however, perceived social support may be protective in terms of both onset and duration of depressed mood. Improvement of available social support could be an important strategy in reducing or preventing psychiatric distress and warding off post-stroke depression. Salter, Foley & Teasell, (2010).

Furthermore, in a study examining the relationship between the perceived adequacy of social support and post-stroke depression in hospitalized Australian patients, social support or the perception of its lack, particularly from a spouse care-giver, was associated significantly with both the presence and severity of depressive disorder after stroke. Furthermore, depressed patients who perceived their support to be inadequate had a longer duration of depressive illness than depressed patients who

perceived their support in a more favourable light. Then the researchers conclude that following stroke, perception of social support from key relationships may mediate the emotional response to this life crisis. Another study, by Huang, Hsu, Hsu, Cheng, Lin & Chuang (2010) provides with increased understanding of the mediating role of social support between functional ability and post-stroke depression/quality of life, that social support may be a promising intervening variable in stroke outcome. Also, Moak & Agrawal (2010) in their study of the associations between perceived social support and physical and mental health, there was evidence for both the main, beneficial effects of high perceived social support and buffering, whereby increased perceived social support ameliorated the pathogenic influence of exposure to traumatic life events on psychopathology, their findings highlight the importance of perceived social support in individuals general mental and physical well-being, both in daily life and upon exposure to negative life events. Social support has also been theorized as a buffer, for people experiencing stress (Cohen et al., 2000). Patient, family support and education are intrinsic components of acute care for stroke. Adequate understanding of the cause and manifestations of the stroke, its treatment, and the prognosis are particularly important, as is counseling to help the patient and family deal with their concerns. Discharge planning extends support and education, identifies a post discharge setting, and seeks to ensure continuity of care. NICE guideline (1995).

Studies have shown a variety of social support indicators to be important predictors of prognosis in Coronary Artery Disease (CAD) patients. Measures assessing the presence, degree and quality of intimate social ties—including measures of marital status, whether the person lives alone or with others, and the availability of various sources of emotional support—have been linked with mortality in patients

with CAD or after MI (3– 6). Indices of social network size, frequency of social activity, group membership, and perceived support have also been found to predict survival (Brummett, Barefoot, Siegler, Clapp-Channing, Lytle, Bosworth, Williams & Mark 2001; Oxman, Freeman & Manheimer, 1995; Orth-Gome´r, Unde´n & Edwards1988; Welin, Lappas & Wilhelmsen, 2000). Less is known about how social support changes over the weeks and months following MI, though clinical lore suggests that such change does occur. For example, it is thought that social support is at its highest during hospitalization and immediately following discharge, with family and friends responding to the "crisis" of the acute event. As the saliency of the medical event decreases, it may be that those in the social network assume a return to normalcy and are less vigilant of or responsive to the needs of the patient. In addition, compromised health may adversely affect social relationships (Cerhan & Wallace, 1997), as patients may be less effective in seeking support.

While it may seem obvious that families play an important role in the rehabilitation and community reintegration of stroke patients, few studies have studied the relationship between family interactions and/or function and the rehabilitation of stroke patients. Close family members, not necessarily caregivers, may experience deterioration in physical, social and emotional function in the first year following the stroke event (Schote et al. 2006). In a sample of 64 close relatives of stroke patients, Schote et al. (2006) reported the greatest perceived decline in health-related quality of life while the patient was still involved in inpatient rehabilitation.

Finally, Burg and Barefoot et al.,(2005) noted in their study that consistent with results from other studies, baseline social support was found to predict medical outcomes, independent of medical co morbidity or other conditions that might

confound this association. When examining their social support risk groups, however, it was found that not having a partner was a more significant predictor of bad outcome than was any other. Hence, regardless of model adjustment, the absence of a partner predicted medical outcomes, and overall score did not significantly moderate this finding. These results would appear to again emphasize the importance of partner in both the experience of social support and the impact that support has on medical outcomes. In some previous studies of post-MI patients, both emotional support and the presence of a spouse or confidant have been associated with reduced mortality risk.

2.3.7 Health Locus of control and Post-stroke depression.

The traumatic experiences of stroke usually bring a lot of psychological and social impacts to the survivors. There is a sense of helplessness, with the loss of mastery and loss of sense of invincibility. Chronic illness raises a number of issues that the person may have to face internally and externally i.e. dealing with symptoms and possibly pains; concerns about an uncertain future, changes in self-image and self esteem, lowered mood, issues maintain control over health and life in general (for example the fact that there may be increased dependency on others) as well as overt the illness and its course of treatment form financial to transportation; potential loss of quality of life, and finally changes in the manner of relationships with family especially (sexuality in men as loss of erection is a serious issues) and other family members and friends. The symptoms and courses of illness are many and varied even in the same type of illness. However, in people with stroke who had survived there is fear of inability to control another occurrence and survivors express fears about their future and creating anxieties about becoming a burden on others if disabled, about the

cost of care and about dying in pain or alone. Though it is also known that surprisingly for some individuals, illness is perceived as brining benefits. One aspect of post stroke recovery is the experience of feeling of loss of personal control – in the context of control over one's illness, treatment, one's recovery, or one's life in general. Locus of control is a situation or where an individual places responsibility for events; Rotter (1996) proposed locus of control could be internal (event under personal control), or external (events seen as under the control of luck, God or other people such as physicians). Maintaining a belief in a degree of internal control has been associated with maintaining well being amongst people especially elderly (Rodin & Timko, 1992).

Illness that brings with it disability, dependence on others, discontent with body and lifelong treatment process as stroke is associated with some degree of loss of personal control. Actual or even just perceived loss of control is associated with depression and anxiety (psychopathology). Mood disruption in the form of anxiety and depression is common in those living with chronic illness, or disability i.e stroke patients do usually have significant levels of emotional distress (anxiety / depression) persisting for progressive periods up to many months after the stroke event. Unfortunately, the presence of depression and anxiety can forestall involvement in treatment options or even rehabilitation efforts: depressed people are less likely to attend rehabilitation classes than non depressed ones and it had been noted that depression and anxiety impede behavioral change (Lane et al., 2000).

A study by Sinyor et al.,(1989) showed that individuals who had high HLC scores expressed greater hopelessness. Health locus of control has been suggested as a mediating factor in a variety of health behaviors and health outcomes, and it is conceivable that stroke patients who see their circumstances as largely determined by

external forces are less likely to take an active role in their own rehabilitation. With respect to their health, a person will seek to embark on health-related behavioral change if they both value their health and believe that any behavioral change will improve their health. People with a high internal locus of control feel more empowered to bring about this behavioral change independently, whereas those whose locus of control is located in powerful others or in chance (external locus of control) feel less empowered to bring about such behavioral change.

Perceived control has been related to life satisfaction in people with diverse illness, an example was by Wassem (1991) who found people with multiple sclerosis who had high internal locus of control to have more knowledge of their disease, to practice more self-care and to have a more benign course of the disease. Even Harkapaa et al., (1991) found health locus of control related to treatment gains for patients with low back pain: those with stronger internal beliefs improved, learnt their exercises better and practiced them more frequently than those with weaker internal beliefs. More importantly to this study recently, locus of control has been examined in the context of stroke rehabilitation and it was discovered by Johnson (1992), that patients with greater internal locus of control showed a speedier recovery. There appear to be many implications from working on health locus of control and its relationship with psychopathology, rehabilitation recovery and course of disease which is somewhat physical in its pathway and the suggestion is that health locus of control could enhance life satisfaction and psychological well being. It could also influence treatment and rehabilitation efforts, the course of the disease and the level of disability. People with high level of personal control are more likely to have a healthy lifestyle, more likely to seek and follow medical advice when ill, are better at coping

with life's crises, have more social support that buffers them against illness and may have a more competent immune system (Peterson & Stunkard, 1989).

Finally, to enhance the coping capacity of the stroke survivors, it is expedient to help to increase their locus of control, information and knowledge, skills in self-care, self-confidence and self esteem. Special attention should be paid to develop a positive belief system on health and recovery, inspiring hope and overcoming the energy deficits to achieve rehabilitation goals.

2.3.8 Cognitive Rehabilitation Techniques and Post-stroke depression

A stroke, no matter the magnitude of the neurological deficit, can have an enormous impact on the psychological wellbeing of the stroke survivor. There are numerous issues to contend with including and not limited to the acceptance of fallibility and mortality, coming to terms with possible on-going physical problems, loss of personal control, loss of sexual prowess and the need to depend on others. There may be a loss of role within community, such as that of career or wage earner and concerns for the future, particularly real fear of possible future stroke occurring. In addition to these issues of adjustment, post-stroke depression is a well-recognized phenomenon that has a neurochemical basis, psychological basis and social basis. Ischemic damage to neurones disrupts serotonergic and dopaminergic pathways that can lead to a biological cause of depression, while situations of the survivor due to roles reversal can lead to psychological basis of depression . Depression can impact on a patient’s ability to rehabilitate. It may lead to poor sleep, impaired appetite and subsequent low energy levels and low motivation. Formal psychological support is of limited availability within hospital medicine as a whole. Ideally, patients with

psychological issues following a stroke should have access to assessment and therapy (Smith, 2014).

The central goal of psychotherapy is to effect a beneficial change in a client through verbal or symbolic interaction (Langer, 1992). To do this therapists frequently ask their clients to reflect on their current emotional experiences, discuss long-standing conflicts, and expand on their knowledge about themselves and their illness. For almost forty years, cognitive deficits following a brain dysfunction have been treated with what can now be identified as cognitive rehabilitation therapy (CRT) (Langer, Laatsch &Lewis, 1999). Cognitive rehabilitation therapy is broadly defined as those activities that improve a patient burden of brain injury or help the patient to better understand the nature of those difficulties while teaching him or her methods of compensation (Klonoff, O'Brien, Prigatano, Chiapello, & Cunningham, 1989). Scientists have found out that cognitive rehabilitation after a stroke helps stroke survivors greatly. They have found out that it must help the mind in much the same way that physical therapy helps the body. Scientists are saying that it must be focused on several factors affecting a stroke survivor. Their data shows that cognitive rehabilitation works best when tailored to the stroke victim's age, the extent of injury, the symptoms felt and the amount of time since the onset of the stroke. Taking these factors into account, results of newer studies may effectively help to establish treatment guidelines which are based on empirical data.

Psychological reactions to stroke are in large measure determined by an individual's pre-morbid thought processes, personality, and coping mechanisms (i.e., the thoughts and behaviors employed by a person in an effort to manage a stressful situation). Individuals who are predisposed to feeling distressed and who tend to be highly emotional in reaction to stress are more likely to interpret or to appraise their

condition as overly stressful and to feel that they lack control over it. The ability to cope with the illness, therefore, depends both on the appraisal of the event as stressful and on the capacity to utilize effective strategies in changing one's relationship to the situation and regarding it as manageable. Neuro-rehabilitation involves different modalities of therapies, depending on the type of neurological deficits detected by the physician/neurologist/surgeon. It includes physiotherapy, occupational therapy, speech and language therapy, cognitive rehabilitation/psychotherapy, visual rehabilitation, audio-logical rehabilitation, sexual therapy, relaxation and music therapy. The advent of new functional neuroimaging techniques, ICT systems, regenerative medicine, robotics and virtual reality has impacted positively on neurorehabilitation (Owolabi & Hamzat, 2010). Regardless of the model employed, neurorehabilitation involves different modalities of therapies depending on the type of neurological deficits detected by the clinician, to maximize recovery from the neurological ailment; all relevant interventions should be instituted as soon as possible. In addition, secondary prevention of neurological injury, prevention of complications as well as fitness training and promotion of healthy lifestyle which can be used to prevent development of secondary health conditions are essential components, Owolabi & Hamzat (2010), and in this study focus will be on the cognitive processes of cognitive rehabilitation in stroke survivors.

A study, Malia et al. (2002) demonstrated that Cognitive Rehabilitation (CR) treatment was effective in improving certain cognitive functions of stroke patients with Post-stroke depression. Post-stroke depression is also known to increase disability, morbidity, and mortality among the medically ill (Jiang & Krishnan, 2011). However, it had been noted that less than 10 percent of those who had had a stroke within two years were receiving psychotherapy or physical therapy, even when these

services were available. Patients who got such care reported lower levels of disability and problems over time, while these interventions had not been available.

Stroke survivors with Post-stroke depression are less active in their rehabilitation and show greater impairments in their activities of daily living than patients who are not but who have the same severity of stroke (Ramasubbu, Robinson, Flint, Kosier and Price, 1998). In the recovery process after stroke, many patients and their caregivers (including physicians) focus on the patient's physical disabilities and fail to appreciate that the psychological complications of stroke can hinder a patient's recovery. Early diagnosis of post-stroke depression and anxiety is essential as there is evidence to suggest that effective treatment of the depression enhances recovery from impaired activities (Robinson, 2003). This treatment, however, is frequently not forthcoming.

Psychopathology, especially depression after stroke are often not detected or are treated inadequately (Anderson, Vestergard, Ingemann-Nielson, Lauritzen, 1995) Few studies have considered the use of psychological interventions in the treatment of depression following stroke. This is highlighted by the extensive co morbid problems caused by this Post-stroke depression such as lowered adherence, lower quality of life, lowered sexual interest with impact on the survivor and the partner(s) and many more. To this end, determining the psychosocial factors that may influence Post-stroke depression is important if we are to gain better understanding to the underlying mechanisms at play in stroke populations.

Cognitive Rehabilitation Therapy (CRT) is an effective treatment of depression in the stroke survivor population (Gloaguen, Cottraux, Cucherat & Blackburn, 1998) and in the elderly, (Thompson, 1996) and there is some indication that it may be effective for people with stroke even in Nigeria. This epidemic, its

rehabilitation and hindrances to rehabilitation is a problem to the world at large. Cognitive Rehabilitation therapy is as effective as medication – in controlled trials, approximately 50% of patients with depression experience clinically meaningful improvement (NICE, 2006). However, within the cerebrovascular accidents victims worldwide and more especially Nigeria use of these psychological therapies such as cognitive rehabilitation therapy which combine these approaches remains largely elusive (CEP, 2006). Depression is common among stroke patients, with the risks of occurrence being similar for the early, medium, and late stages of stroke recovery.

These evidence-based reviews and meta-analyses have shown that CRT can rival the effects for certain medications, and in that it includes the use of CBT, Problem solving and psycho education, that CRT can enhance the effectiveness of medication alone (the US Heart foundation rated the combination as Grade B level but more recent published studies suggest the higher Grade A level may now be warranted), and that CRT effects are "real" and can impact pain pathways deep within the brain (as judged from laboratory studies when effects of components of CRT have been examined.

Cognitive rehabilitation is defined as a systematic, functionally oriented service of therapeutic activities that is, based on assessment and understanding of the patient's brain behavioral deficits. Specific interventions may have various approaches, which include: i) Reinforcing, strengthening or reestablishing previously learned patterns of behavior. ii) Establishing new patterns of cognitive activity through compensatory cognitive mechanisms or impaired neurological systems. iii) Establishing new patterns of activity through external compensatory mechanisms such as personal orthoses or environmental structuring and support. vi) Enabling persons to adapt to their cognitive disability, even though it may not be possible to directly

modify or compensate for cognitive impairments, in order to improve their overall level of functioning and quality of life

Psychological reactions to stroke are in large measure determined by an individual's premorbid thought processes, abilities or activities, and coping mechanisms (i.e., the thoughts and behaviours employed by a person in an effort to manage a stressful situation). Individuals who are predisposed to feeling distressed and who tend to be highly emotional in reaction to stress are more likely to interpret or to appraise their condition as overly stressful and to feel that they lack control over it. The ability to cope with the illness, therefore, depends both on the appraisal of the event as stressful and on the capacity to utilize effective strategies in changing one's relationship to the situation and regarding it as manageable. Proper access to evidence based psychological therapies will likely only be possible through delivery of high and low intensity interventions (Bennett-Levy, Richards & Farrand, 2010). High intensity – face to face by a trained and competent mental health professional, Low intensity – self-help based on cognitive behavioral therapy and supported by someone competent in supporting the materials. Cognitive rehabilitation technique involves the elements of problem solving therapy and cognitive behavioral therapy.

In broad terms, rehabilitation principally focuses on the enhancement of human functioning and quality of life. In contrast, other branches of health care primarily focus on prevention and treatment of disease. Rehabilitation accepts the complex correspondence between disease and the ability to function: a disease may be eradicated while disability remains; disability can be reduced in the face of permanent or near permanent injury or chronic disease. Cognitive rehabilitation therapy is sometimes confused with cognitive behavioral therapy, they are similar but different. CRT is used to rehabilitate thinking skills impaired by brain injury, CBT centers

majorly on modifying maladaptive thoughts in a variety of emotional and psychiatric disturbances; while different they are not mutually exclusive and sometimes delivered conjointly (Institute of Medicine, 2011). Most times this involves problem-solving approach in the therapy; this as an objective assessment of everyday problem-solving skills seems particularly appropriate to be part of the module to help stroke survivors to solve presenting difficulties and would allow investigators to evaluate whether improvement in problem-solving ability in fact mediates outcomes. Incorporating neuroimaging into psychotherapy research could potentially yield valuable information about the processes underlying treatment response in individuals with executive dysfunction **(**Areán, Raue, Mackin, Kanellopoulos, McCulloch, Alexopoulos, 2010). Problem solving is a type of psychotherapy based on the idea and plan to increase patients' understanding of the link between their current symptoms and their current problems in living which is in fact part of the cognitive rehabilitation therapy (CRT). It increase patients' ability to clearly define their problems and set concrete and realistic goals teach patients a specific, structured problem-solving procedure. It emphasizes both thoughts and behaviours in treatment of psychological disorders. According to these theories, changing ineffective thoughts or behaviors and teaching ways of solving the resultant problems will affect mood and alleviate depression and anxiety.

Using cognitive rehabilitation therapy, while incorporating the problem solving and cognitive behavioural therapy modules, the patients learn to alter maladaptive thoughts that amplify feelings of worry, loss of control/helplessness and increase pleasant, social and physical activities which produce positive experiences of patients' own ability to solve problems, thereby increasing their confidence and feelings of self-control/locus of control while also restoring their sense of control.

They learn to perceive situations as more manageable and respond to these situations effectively, thereby improving their mood and altering their physiology. Patients with catastrophic reactions or heightened emotionality may also benefit from cognitive rehabilitation therapy, as these reactions may represent a lack of effective coping strategies to stress. In Nigeria today, stroke patients are not offered psychotherapeutic interventions and if offered not in a systematic, measurable and acceptable manner; however, the problems of post-stroke psychopathology such as depression are prevalent among these patients. Understanding what and how to do the right interventions per time and the primary prevention is the key to reducing the burden of the disease in a country with such poor resources (Wahab, 2008).

Psychological, physical and cognitive deficits following stroke are common and interfere with recovery. Cognitive rehabilitation incorporates principles of restorative neurology and neuropsychology and has now become an integral component of stroke rehabilitation strategy. The process of cognitive rehabilitation involves assessment of several capabilities including but not limited to cognitive functions, identification of specific areas of impairment, goal setting and institution of appropriate rehabilitation techniques. Currently, there is enough evidence supporting the effectiveness of cognitive rehabilitation of neglect and aphasia in stroke. Apraxia, inattention and executive dysfunction may also improve with specific intervention. Compensatory strategies are the mainstay of managing patients with memory disturbances. In addition to specific cognitive deficits, physical and emotional disturbances as well as social support affect functional recovery. Comprehensive and holistic cognitive rehabilitation programs are necessary to improve daily life function in stroke patients with the recent growth in knowledge of neuropsychology and restorative neurology, cognitive rehabilitation has become an integral component of

stroke management. Cognitive disturbances are frequent in patients with stroke and cause significant disability (Das & Reddi, 2010).

Cognitive disability manifests has reduced efficiency and pace of functional recovery, decreased effectiveness in performing routine activities of daily living or failure to adapt to novel or problematic situations. Cognitive functions and not motor impairment predict psychosocial burden on the caregivers of elderly stroke victims. In addition, cognitive deficits also contribute to post-stroke depression. Stroke rehabilitation programs therefore now incorporate interventions designed to promote recovery of cognitive functions. Experts frequently comment on the rapid growth of cognitive rehabilitation as a treatment modality in the past fifteen years (Gianutsos, 1991; Lehr, 1990). Informal caregivers in the lives of stroke survivors are increasingly seeking cognitive rehabilitation therapy services and systematic studies of individuals 5– 7years post brain damage have revealed that without treatment many individuals do not continue to progress and may even get worse (Gianutsos, 1991). The recent growth in the field of cognitive rehabilitation therapy has led to the development of a variety of models of cognitive rehabilitations and a lot of types of treatment have come up including neuropsychological rehabilitation, cognitive retraining, behavioural rehabilitation, and cognitive remediation. In addition, related therapeutic approaches that focus on a specific cognitive problem include memory rehabilitation and perceptual rehabilitation. Though currently, there is uncertainty in defining the extent of cognitive rehabilitation, it is generally accepted as techniques involving facilitation of change and involving interventions that impact the emotional and cognitive status of the client receiving treatment (Langer, et al., 1999). Lincoln, Flannagan, Sutcliffe, & Rother (1997) compared a 4-week baseline period with 10 sessions of CBT and found that there was a tendency for improvement in mood. Of

the 19 patients who received CBT, 4 patients consistently showed benefit, 6 showed some benefit, and 9 showed no benefit from treatment. The researchers concluded that CBT reduced depression in some stroke patients and further evaluation was required. Others, Hibbard, (Grober, Stein, Gordon 1992; Kemp, Corgiat & Gill, 1992) have also reported single case studies that suggest that CBT may be useful for post-stroke depression. Kemp, Corgiat & Gill (1992) investigated the effects of brief cognitive behavioural group psychotherapy for depression on 41 older adults with and without disabling illness. Older adults with disabling illness (n-18) included some people who had a stroke. Results indicated substantial decreases in depression, but the study did not include a control group.

Patients do respond differently to illnesses, incapacitating conditions and diseases depending on their capacity for creative adaption in their lives, the severity of the illnesses and also their view about the course of recovery and most importantly the support available in their lives. Goodheart et al. (1997) asserts that patients also differ in the degrees of help needed to reorganize within their altered realities. They may seek psychological help spontaneously, or they may be referred for psychological help. They may struggle to reorganize on their own. They may not reorganize and refuse help. Some are at risk for suicide. Patients whose diseases have special characteristics (e.g., visibility or stigma) often find the task of adaption more difficult. In such instances, patients not only must cope with the disease but also must find a way to deal with the reactions of others.

In managing patients with whatever psychopathology, the main goal of psychotherapy is to effect a beneficial change in a client to previous level of functioning or a level of functioning without distress through verbal or symbolic interaction and in doing this, a clinician reflect on patient's emotional states and

experiences, past and present conflicts, expectation and shortcomings, while also expanding their knowledge about themselves. Unfortunately, it's so true and important to remember that often signs following strokes are significant cognitive impairments, difficulties in understanding and judgment which overall impair therapy, thus effectively reducing recall of therapeutic interventions during and after therapy which is a crux of psychotherapy. However, over the years cognitive deficits have been treated with what can now be effectively identified as cognitive rehabilitation therapy (Laatsch, 1999). Cognitive rehabilitation therapy are those activities that improve a patient with brain injury or stroke's "higher functioning or help the patient to better understand the nature of those difficulties while teaching him or her methods of compensation" (Klonoff, O'Brien, Prigatano, Chiapello, & Cunningham, 1989). This further involves facilitation of change and both involve interventions that impact the emotional and cognitive status of the client receiving treatment.

Regardless of the model employed, neuro-rehabilitation involves different modalities of therapies depending on the type of neurological deficits detected by the clinician. It includes physiotherapy, occupational therapy, ergotherapy, speech and language therapy, cognitive rehabilitation, psychotherapy, visual rehabilitation, audiological rehabilitation, sexual therapy, relaxation and music therapy. In order to maximize recovery from the neurological ailment, all relevant interventions should be instituted as soon as possible. In addition, secondary prevention of neurological injury, prevention of complications as well as fitness training and promotion of healthy lifestyle which can be used to prevent development of secondary health conditions are essential components.

Truly, as expected cognitive rehabilitation therapy is not the only method of treatment for depression there are other methods which have different levels of

success in studies and a major treatment method is cognitive behavior therapy which include changing the negative way people think about themselves and life after an illness such as stroke. This is believed to be through a negative filter and their thinking patterns which must have become so entrenched that they don't even notice errors of judgment caused by the irrational thinking pattern. Another is interpersonal therapy, which hinges the treatment model on the social functioning of the stroke survivor and his personality, therefore the major thrust of the model is that depression in survivors and interpersonal problems are interrelated. The goal of interpersonal therapy is to help a person understand how these factors are operating in their current life situation to lead them to become depressed and put them at risk for future depression. Also, mindfulness-based cognitive therapy is a new (relatively new) treatment for depression based on mindfulness meditation which focuses on being aware of what is happening in the present on a moment by moment basis, while not making judgments about whether we like or don't like what we find. Furthermore, counseling, which encompasses a broad set of approaches and goals that are essentially aimed at helping an individual with problem solving - solving long-standing problems in the family or at work; or solving sudden major problems (crisis counseling). Finally, narrative therapy is a form of counseling based on understanding the 'stories' that people use to describe their lives. The therapist listens to how people describe their problems as stories and helps the person to consider how the stories may restrict them from overcoming their present stroke illness and depressive states. Narrative therapy sees problems as being separate from people and assists individuals to recognise the range of skills, beliefs and abilities that they already have (but may not recognize) and that they can apply to problems in their lives. Narrative therapy differs from many therapies in that it puts a major emphasis on identifying people's

strengths, particularly as they have mastered situations in the past and therefore seeks to build resilience rather than focus on their shortcomings.

As determined by the patients needs, rehabilitation is offered in various settings including hospital, rehabilitation center, home, community or hospice. It involves coordinated multi-specialist team of doctors, nurses, therapists, social service staff, health educator and psychologists (Owolabi & Hamzat, 2010). Regardless of the specific approach or area of intervention, cognitive rehabilitation services should be directed at achieving changes that improve each person's function in areas that are relevant to their everyday lives. Recovery from cognitive deficits caused by infarcts occurs by a process of brain plasticity and cortical reorganization. Finally, although psychotherapeutic interventions had not always been accessible to patients in the neurological clinics in Nigeria, involvement of clinical psychologists can help patients in thorough assessment, enhance coping strategies, mechanisms and engage in effective thought processes and behaviour by keeping in mind the specific needs of these patients. These clinicians can facilitate coping processes whenever they treat their patients to understand what part of the illness is under their control (e.g. by supplying them the resources that they can draw from in the process of rehabilitation and by teaching them constructive problem solving strategies and social skills training).

2.4. Conceptual framework

In broad terms, rehabilitation principally focuses on the enhancement of human functioning and quality of life. In contrast, other branch of health care focuses primarily on prevention and treatment of disease. Rehabilitation accepts the complex correspondence between disease and the ability to function: a disease may be

eradicated while disability remains; disability can be reduced in the face of permanent injury or chronic diseases. Rehabilitation is often considered in regard to improving physical disabilities. For a person with stroke, rehabilitation might examine whether the individual strength could be improved through exercise, mood could be increased through psychotherapy, mobility or navigation can be improved through braces or wheelchair despite paralysis, skills training in doing some activities on his/her own and improving social policies and services for people with acquired disability.

In this study, the modular model of CRT is being used, this implies that treatments are generally aimed at a single cognitive impairment, which is depression in the stroke survivor ('improving mood') or memory ('memory remediation') or language ('aphasia therapy'). Such treatments, when delivered alone, might be expected to enhance activities and participation most effectively in patients with a single or predominant impairment (i.e. patients with a more focal impairment). Change due to modular CRT can be either restorative or compensatory. Restorative treatments are aimed directly at improving, strengthening, or normalizing specific impaired cognitive functions. Such treatments frequently have an 'exercise-like' aspect in that it involves most times intensive and repetitive use of a particular cognitive process while gradually increasing the level of difficulty or the processing demands. Compensatory treatments, in contrast seek to provide alternative strategies for carrying out important activities of daily living despite residual cognitive impairment. The compensatory treatments are typically more tailored to specific needs of the stroke patient, to the person's willingness to use the strategy, and to the demands of specific activities. There is an ongoing debate on whether there is ever a true restoration or the behavioural improvements simply become more like the norm and thus, less visible. A lot of mediators /moderators had been used and highlighted

in the effectiveness of any CRT these include personal factors of the stroke survivor , environment the stroke survivor is living and the quality of the CRT and the quality of the CRT delivered.

For every CRT or any intervention the goal of treatment is significant improvement in the abilities to carry out daily /previous functioning in the stroke patient's physical and social environment and significant improvements in the quality of life (Employment /job status, functionality in home, community participation and changes and improvement in the health of the caregiver). Practitioners and researchers acknowledge that the ultimate goal of treatment should be functionality meaningful improvements in the patient (i.e., activities, participation), and there may be many approaches to reaching this goal (Sohlberg and Mateer, 2001). See **Figure 2-5** Model for the Conceptual frame work**.**

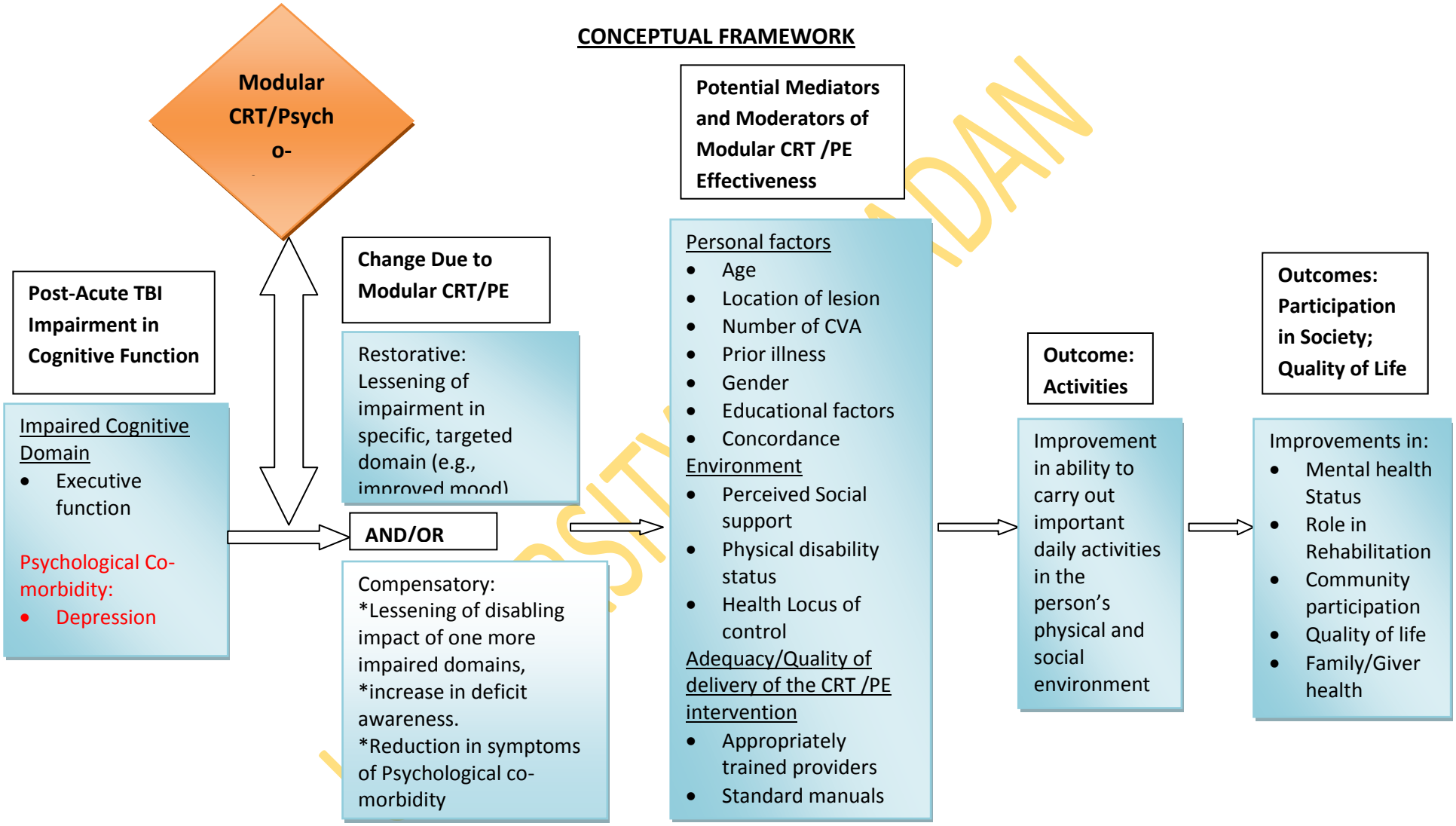


FIGURE 2-1 Model for modular CRT, Olukolade, 2014

2.5. HYPOTHESES

1. Stroke patients with left hemispheric brain lesion will report significantly higher level of post – stroke depression than those with right hemispheric brain lesion.
2. Ischemic stroke will significantly influence post-stroke depression than hemorrhagic and mixed type of stroke in survivors.
3. Females will be significantly higher on post-stroke depression than males in stroke survivors.
4. There will be a significant interaction effect of age group and level of physical disability on Post-stroke depression among the stroke survivors.
5. Age, gender, concordance and prior illness will independently and jointly significantly predict post-stroke depression among stroke survivors
6. There will be significant independent and joint influence of location of brain lesion, physical disability and stroke levity on post-stroke depression of the survivors
7. Patients' type of health locus of control will independently and jointly predict level of Post-stroke depression.
8. Stroke survivors with low level of perceived social support will report significantly higher level of post depression than stroke survivors with high level of social support.
9. Gender, age, occupation religion, stroke type, prior illness, concordance and lesion location will significantly predict location of post-stroke depression among survivors.

10 Stroke survivors exposed to cognitive rehabilitation therapy (CRT) will have significant reduction in their post –stroke depression at post-test than pre-test than the waiting list control (CT) survivors.

11. Stroke survivors exposed to cognitive rehabilitation therapy will have significant positive difference to the psycho education therapy and waiting list control on their level of Post-stroke depression controlling for stressful events

2.6 OPERATIONAL DEFINITION OF TERMS

Cognitive Rehabilitation Therapy: these are the remedial processes of helping people especially stroke patients with neuropsychological problems in this case post-stroke depression to enhance their level of cognitive functioning and independence or help the patient to better understand the nature of these difficulties while teaching him or her methods of compensation. This includes interventions to lessen impairments, or disabling impact of those impairments. This rehabilitation allows the stroke survivors to accomplish important life activities and fully participate in society. These modules are developed and tailored to meet each client specific needs in a nine session format.

Psycho-education therapy: This refers to the giving of information, leaflets and answering questions about stroke generally. This treatment is "information gathering based" and it involves being knowledgeable about causes, course, prognosis and mortality of illness. The module of this group lasts for nine sessions weekly for about 45-60 minutes of individual therapy.

Control/waiting list: This refers to respondents who are not exposed to any of the psychological treatment procedures; however, continue the usual care of the facility.

Stroke: a rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain, caused by a blocked or burst blood vessel, as diagnosed by a medical physician with classification of ischemic, hemorrhagic or mixed.

Location of brain lesion: this is the identification of the specific area where there had been the traumatic injury to the brain which might either be right or left hemisphere and this will be determined by the result of a Computed Tomography (CT scan) assessed and diagnosed by a physician neurologist with a classification of left or right hemispheric brain lesion.

Physical disabilities: these are physical impairments that can make performing an everyday task more difficult, which has either direct or interactive effect on the patient's health status, such as activities of daily living for patients recovering from stroke and these are broad range of activities associated with everyday living. Such as preparing main meals, washing up, washing clothes, light housework etc. This was measured with the Mahoney and Barthel, (1965) which had 10 items on a continuum of classification of fully dependent to independent i.e. 100-0.

Perceived social support: this is the perceived availability of people whom the stroke patient trusts and who make the patient feel cared for and valued as a person, also the perception of the stroke patients towards the help they can or receive from people they regard as close to them. This was measured with the 12 item multidimensional scale of perceived social support by Zimmet et al., (1988) with classification of high perceived social support or low perceived social support.

Health locus of control: these are the attributions people make after getting sick that are critical in determining what effects that illness episode will have on them either internal or external. This was measured by the18 items multidimensional health locus

of control scale by Wallston ,(2005) with classification of internal, chance, powerful others.

Post-stroke depression: This is the mood disorder or changes in emotional experience and behaviour of a client who had undergone stroke. As defined by the DSM-IV-TR it is the depressive disorder due to a general medical condition (i.e. stroke). This will be measured using the Becks depressive Inventory, the long form (21 items) with classification or mild, moderate or severe.

Prior Illness: This is the physical illness the stroke survivor treats before the stroke attack which is a risk factor for the development of stroke.

Concordance: This is the limb or part of the body being used by the survivor which is also the affected part of the body after the stroke attack with classification of concordance or non-concordance.

CHAPTER THREE

3.0 METHOD

3.1 (a) Phase one

The first phase (cross-sectional survey using ex-post facto design) is the assessment of the variables of interest on post-stroke depression i.e. ascertains the impact of location of brain lesion, physical disability, number of cerebrovascular accidents, perceived social support and health related locus of control as determinants of post-stroke depression. This is an intervention study and multi- staged as with clinical research which encompasses assessment preceding the experimental/intervention research. The independent variables are brain lesion, physical disability, concordance, prior illness, gender, religion, perceived social support and health related locus of control while the dependent variable is post-stroke depression.

(b) Phase two

The second phase of this study, which is an (experimental research design) utilizing a pre-post randomized control design. This phase assessed the therapeutic efficacy of the treatment modality of cognitive rehabilitation therapy on post-stroke depression as against psycho educational training and waiting list control which was in three homogenous groups namely homogenous except treatment modality. A baseline score was obtained at entry, then the interventions was introduced to group A (CRT) and B (PET) of the three groups i.e. group A (cognitive rehabilitation therapy), group B (Psycho-education) and group C (Usual care).

All groups had the following variables held constant – level of Physical disability, negative life events, usual medical/Para-medical care, and lesion location

The assessments were done at first contact, then at the third session, the sixth session and at the end of the ninth session (while the interventions were usually held weekly all over a period of 3 and half months).

The experimental groups received a pre-test, the intervention and post-test on the dependent variable (post-stroke depression) using the independent variable.

On other hand the control group received only pre-test and post test only (though the control also received weekly text messages over the phone on general greetings and quotable quotes). Finally the follow up was collected on both the experimental and control group using the dependent variable a week after the intervention was done, pre assessment and post assessment.

The design can be represented in a tabular form as follows

Quasi-Experimental Groups (QEG)	**Pre-Test Assessment (PreTA)**	**Treatment Types**	**Post-Test Assessment**
QEG_1	$PreTA_1$	CRT	$PostTA_1$
QEG_2	$PreTA_2$	PET	$PostTA_2$
QEG_3	$PreTA_3$	Control(Usual care)	$PostTA_3$

CRT- Cognitive Rehabilitation treatment

PET – Psycho-education treatment

Control- Usual treatment without psychological based intervention

Those who score ≥11 on the Beck Depression Inventory are offered the opportunity to consent for the intervention study, with diagnosis of depression validated by diagnostic interview using DSM IV criteria. Because of the short length of stay for ischemic stroke, all subsequent contacts with study participants occur in out-patient setting at clinic follow-up in a pre - arranged rehabilitation facility for psychotherapy facilities at the Family medicine department beside the office of the clinical psychologist at the University College Hospital. While a score of less than 10 at the end of the intervention is considered of therapeutic significance in reduction of post-stroke depression.

No patient had the intervention in hospital bed/ on admission and all the sessions were individualized psychotherapy sessions.

* The intervention was done by integrating the psychotherapy sessions into the body of care of the consenting participants of the study to ensure follow-up, also because patients with stroke deal more with caregivers, the carers were the first to consent and short motivational interviewing was done conducted with them.

At the start of each recruitment process, the patients were carefully told the study purpose, right to consent or wi thdraw, benefits of the study and the likelihood of falling into any of the three groups. Patients who score less than 11 in the becks depression inventory were excluded from the intervention parts of the study. For the intervention stage the patients were randomly assigned into the three groups of intervention with cognitive rehabilitation therapy / Psycho-education and those with no treatment as the third group, the randomization was done using the table of random numbers

3.2 Setting

The study is was carried out in the tertiary health care centre in Ibadan , University College Hospital (UCH), Ibadan. The centre is a leading healthcare provider in the nation and serves primarily the Oyo, Osun, Ogun and some parts of Lagos states while referrals are usually from every part of the country. Ibadan is the capital of Oyo state and Ibadan city has a population of about 3.6 million (National Population Commission, 2006). The Hospital is a major tertiary Hospital in Nigeria with a reputation of being the first Teaching Hospital and it has a wide array of facilities. University College Hospital, Ibadan is a 1000- bedded tertiary hospital which serves as a referral centre from primary and secondary health centers all over Nigeria and West African sub-region. Patients with strokes were mostly admitted through the Accident and Emergency department (A&E), the General out-Patient Department (GOPD), and the Medical out-patient of the Hospital (MOP). Surviving patients were discharged to the medical outpatient clinic for follow-up and almost always to the Physiotherapy (neuro-physiotherapy clinic) for exercises. It was from this population that the participants were drawn from the stroke population visiting on out-patients basis at the MOP, GOP, physiotherapy clinic and those residents on the wards. The neurology clinic has 4 consultants and 8 residents comprising of house officers and residents at the time of carrying out of the research. The surviving stroke patients at the time of the study were about 230 on the wards, medical outpatients and attending the other clinics.

3.2.1 Sample size

According, to Baoliang Zhong, (2009) to design clinical trials, efficiency, ethical considerations, effective cost management, and management of time to reduce unnecessary research duration and sample size calculations are the key things to remember. Randomized controlled trial (RCT) is considered as the gold standard for evaluating intervention or health care. Compared with an observational study, randomization is an effective method to balance confounding factors between treatment groups and it can eliminate the influence of confounding variables. Even the most rigorously executed study may fail to answer its research question if the sample size is too small. On the other hand, study with large samples will be more difficult to carry out and it will not be cost effective. When calculating sample size when outcome measure is continuous especially when the problem is that is there a difference in the efficacy of (A) and (B) for the treatment of a particular disorder, change in state (i.e. depression level) is the primary measurement, compared to baseline. Then:

The sample size for the study can be calculated using the following sample size calculation

$$\mathbf{n} = \frac{\mathbf{t^2 \times p\ (1\text{-}p)}}{\mathbf{m^2}}$$

n= required sample size

t= Confidence level at 95% (Standard value of 1.96)

p= estimated prevalence of stroke in the projected area

m= margin of error at 5 %(Standard value of 0.05)

* Prevalence from Lagos registry of stroke is 114 in 100,000. Ojini & Danesi, (2003)

Therefore, the sample size for stroke patients for the study was 89

However, 90 patients were used for the first phase study, while the intervention stage had a double blind selection of 30 stroke survivors of at least 10 participants in each of the three groups.

3.3 Sampling Technique

The stroke survivors were drawn from the stroke population visiting the Accidents and Emergency clinic, Medical Out patients, Physiotherapy clinics and on the Wards. These patients were purposefully drawn from the survivor's population. The patients were assessed on the Beck Depression Inventory (BDI) and only those who score less than 11 were recruited to be part of the study. While for the intervention phase, the patients were randomly assigned using table of random numbers into the three groups of Cognitive rehabilitation therapy (CRT), Psycho-education therapy group (PET) and the Control Group (CG). The assignment into the group were double blinded from the researcher as only the trained assistant knew the survivors who will be in any specific group and the assessment scores at each point throughout the therapy.

3.4. Participants

A total of 90 respondents who are stroke survivors were eligible to be administered the questionnaire and showed the willingness to supply the requested information on the questionnaire for the study. There were 126 stroke survivors available throughout the duration of the study, however only 90 were selected through purposive sampling technique who met the criteria for inclusion. However, six people meet the study criteria but declined being part of the study and four survivors drop out of the groups. The second (experimental part) of the study had 35 eligible participants

for the study and they were randomly assigned into the groups. Of the total 90 respondents, 38(42.2%) were male, and 52 (57.8%) were female. The mean age was 57.33 years (S.D=12.72 years), While the age of the stroke survivors ranged from 30 to 84 years. A total of 16 (17.8%) had no education, 23 (25.6%) had primary education only, 16(17.8%) had secondary education, 26(28.9%) had tertiary education and 9 (10%) had at least doctorate degree. Prior illness before the stroke was hypertension 34(37.8%), Diabetics 4(4.4), heart disease (2), others (combinations) 25 (27.8) and none 25 (27.8%). The type of stroke had was Ischemic 39(43.3%), hemorrhagic 9 (10.0) and unknown 42 (46.7). For 53(58.9%) the lesion was located on the left while 37(41.1%) on the right. In the area of concordance was 51(56.7%) while the Not Concordance 39 (43.3%). The religious affiliations are Christians 57 (63.3%) and Muslims 33(36.7%), the ethnic groupings of the participants are Yoruba 80(88.9%), Ibo 2(2.2%), Hausa 1(1.1%), others 7(7.8%).

3.5. Instruments

1. Demographic variables

   The demographics used in the study are Gender, Age, Educational status, Religion, ethnic background, Prior illness before the CVA, Lesion location and concordance.

2. CT scan to identify the area of lesion; however, this is normally done for every patient in the stroke unit therefore permission was only taken for its extraction from their files.

3. Physical disability:

   The Barthel Index (BI) was first introduced by Mahoney and Barthel in 1965, which is now extensively used in rehabilitation. It was initially developed to

measure functional ability before and after treatment and to assess the amount of nursing care needed. Initially it was designed for use with long-stay hospitalized patients with neuromuscular or musculoskeletal problems Mahoney & Barthel (1965). It has subsequently been used and applied to evaluate treatment outcomes. It is extremely popular, and is one of the oldest and most widely used tests. The BI is based on a rating scale that is completed by an observer. It covers personal toileting, feeding, mobility from bed to chair, transfers, bathing, walking, dressing, incontinence and going upstairs. A total of 10 activities are scored, and the values are then added to give a total score ranging from 0 (totally dependent) to 100 (completely independent). Lower scores indicate greater dependency. The BI measures what the patient actually does rather than what they can do. Information is obtained via verbal reports from patients, carers and staff, and by direct observation of some activities. The BI is sensitive, has concurrent and predictive validity, and is reliable (Mahoney & Barthel, 1965). It has good inter-rater, test–retest, and reported or observed reliability (Fricke & Unsworth, 1997). The internal consistency of the BI is extremely high, with a Cronbach's alpha coefficient of 0.98 Intra-observer and inter-observer reliabilities are high, with a Pearson's r score ranging from 0.89 to 0.99 (Shinar, Gross, Bronstein et al.,1987). In the present study it had a Cronbach alpha coefficient of 0.90 in the stroke population.

4. Health related locus of control:

The Multidimensional Health Locus of Control (MHLC) Scales were developed by Ken Wallston and colleagues. These scales were designed to assess a person's beliefs regarding whether his or her health status is

determined by the actions of individuals (as opposed to fate, luck, or chance) and, if so, whether the locus of that control is "internal" (i.e., residing in the person's own actions) or "external" (i.e., dependent on the actions of other people). The MHLC (Form C scales) was used, which separated externality into two dimensions powerful others and chance. The MHLC Scales had become the instrument of choice for health researchers wanting to assess perceived control of health. The three MHLC subscales are IHLC (eg, "The main thing that affects my health is what I myself do"), PHLC (e.g., "My family has a lot to do with my becoming sick or staying healthy"), and CHLC (e.g., "If it is meant to be, I will stay healthy"). In most populations, IHLC and PHLC are uncorrelated with each other, IHLC and CHLC are slightly negatively inter-correlated (-.l0 to -.20), and the two external dimensions, PHLC and CHLC, are somewhat positively inter-correlated (.20 to .30). The alpha reliabilities of the six-item subscales hover around .70 (.65-.75), and the test-retest reliabilities are in the range of .70-30 (Wallstron et.al, 2005).

Form C of the MHLC Scales designed to be a generic, medical-condition-specific assessment of locus of control belief. Each item of Form C contains the word "condition," which can be left intact or substituted with the name of an existing condition (e.g., "diabetes"). Form C has the same subscale structure as Forms NB, except that PHLC consists of two three-item subscales-"doctors" and "other people signifying a more complex discrimination of the role that physicians play in determining the health status of those already diagnosed. It consists of 18 items which had demonstrated excellent psychometric properties and is valid for routine use and clinical trials

in stroke population. In the stroke population of the study, it had a Cronbach's alpha coefficient of 0.65.

5. Becks depression inventory:

The original version of the Beck's Depression Inventory (Beck et al., 1961). It was published in 1961 and subsequently revised (Beck and Beck, 1972; Beck et al., 1979; Beck, 1988). It had been extensively used especially in assessing and monitoring changes with cognitive therapy and it was used to measure level of post-stroke depression. The long form of 21 items will be used to provide a quantitative assessment of the severity of depression. <10 represents minimum or no depression; 10-18 indicate mild to moderate; 19-29 showing moderate to severe depression; 30-63 is severe depression. Reliability studies showed a test-retest correlations having ranged from 0.48-0.90 (Beck et al., 1988), it had been extensively used in Nigeria with various validations; in the present study it had a Cronbach alpha coefficient of 0.77 in the stroke population.

6. The Hospital Anxiety and depression scale:

The Hospital Anxiety and Depression scale by Zigmond and Snaith (1983) was be used, it is a self-assessment scale that has been developed and found to be a reliable instrument for detecting states of depression and anxiety in the setting of a hospital medical outpatient clinic. The anxiety and depressive subscales are also valid measures of severity of the emotional disorder. The HADS comprises statements which the patient rates based on their experience over the past week. The 14 statements are relevant to generalised anxiety (7 statements) or 'depression' (again 7), the latter being largely (but not entirely) composed of reflections of the state of anhedonia (inability to enjoy oneself or

take pleasure in everyday things enjoyed normally) HAD has good internal reliability (depression scale _ = 0.91, anxiety scale _ = .81, stress scale = .89). Strong correlations were also found between scales with depression-anxiety r =.42, anxiety-stress r =.46 and depression-stress r =.39. The scale had a Cronbach's Alpha of 0.64 in the stroke survivors.

7. Perceived social support:

The Perceived Multidimensional Social Support Scale (Zimet et al., 1988) is a twelve item scale of the level at which a patient feel he/she is been well integrated and cared for by those close to him/her. The psychometric properties of the Multidimensional Scale of Perceived Social Support have been demonstrated in diverse samples (Canty-Mitchell & Zimet, 2000). In the stroke population of the study, it had a Cronbach's alpha coefficient of 0.79.

8. Life events stress scale:

Life events were assessed (i.e., undesirable and severe). These events were also classified as primarily interpersonal (e.g., death of a loved one) or related to achievement (e.g., loss of employment). The patients will be asked about events that occurred during the 6-month period before the onset of the current post stroke -depressive episode. While also the comparison subjects would be asked about events during the 6-month time period immediately preceding the interview. The 6-month time frame was used because it has been shown to be the optimal time period for detecting an effect of life events on subsequent depressive onset, and other studies have used this standard, it had a 0.84 Cronbach Alpha reliability score.

9. Psychological index of stroke scale:

This scale is developed for use in the study and measures psychological distress in stroke patients. Items for the scale were drawn up from in-depth interviews with stroke survivors, where 22 items were initially produced. The items were further crosschecked for ambiguity or misunderstanding after which deleted items were replaced by new ones, then item total correlation was done while the non correlating items were removed. This was further crosschecked until all items appeared to be unproblematic. A response scale was decided upon using the Yes and No (1) or (0). Norms for the scale, reliability and item analysis was done to obtain a Cronbach's alpha of 0.60 after which it will be measured against the beck and hospital anxiety and depression instruments which are measure of psychological distress to determine its validity, it had a concurrent validity of 0.5 and 0.6 respectively. Its content validity was further ascertained by factor analysis which showed good factor loading in a four-factor solution. This explained about 80% of its variance.

10. Stroke Levity Scale (SLS):

This was applied as an index of stroke severity. The SLS is a valid measure of stroke severity, which does not require the ability of the patient to read certain sentences written in the English language as this would exclude illiterate patients. The SLS also showed good internal consistency reliability with a Cronbach score of 0.70 and in the study 0.71

3.6. Procedure

Request for consent was taken from the relevant authorities and the participants before being recruited into the study. The ethical board of the UI/UCH Research committee approved the study in its entirety.

The UI/UCH Ethics Committee assigned number: UI/EC/11/0296.

Initially, the researcher had met with the head of department of the physiotherapy department, the head of the neuro-physiotherapy unit, and with a consultant neurologist in the neurology department, to discuss the project and provide with questionnaire packets and at the different meetings the resident doctors (neurology) and physiotherapy interns were assigned the responsibility of providing the appropriate respondents and supplying some of the information the research requires such as the result of the CT scan, type of stroke, prior illness and these were to be validated by further questioning by the researcher. Also, both sets of health practitioners have a fore knowledge of the inclusion and exclusion criteria for the type of stroke survivors needed for the study. It usually takes an average of about 15-20 minutes for a neurologist to have a follow-up for a survivor while it take about 1 hour-1 hour 30 minutes for a physiotherapist to finish a session with a stroke survivor.

The health practitioner (neurologist or physiotherapist) usually tell the clients about the study which will improve their overall well-being if they agree to the study a small slip had been pre-arranged and written to the clinical psychologist (who was given a cubicle for the study in both clinics). Those who are not interested are not sent to the clinical psychologist, however, this was very much uncommon because they are often well primed by their primary care givers and the numbers of those declining was usually given at the end of each clinic day.

The respondents who gave consent were given the consent form and signed or their caregiver signed on their behalf. Next, the survivors completed a battery of psychological questionnaires. Typically, this takes about 30 minutes to complete, the screening tool which was Becks Depression Inventory (BDI) was used to know those who qualified for the second stage of the study. Before the questionnaire were administered a small preparatory talk about the stages and those who will be and the groups are given to each respondent. When the patient was eligible they were randomly assigned using table of random numbers to each of the 3 experimental groups.

Due to the intricacies of patients coming in for different procedures every time, it was agreed that the patients come for the psychological sessions also on the dates of their physiotherapy clinics and not neurology appointments which is often once monthly or in 2months. This is usually on Mondays (Physiotherapy), Wednesday (Physiotherapy, Neurology afternoon (2pm)) and Fridays (Physiotherapy).

The sessions were individual sessions and often once a week, there was a roster chart done where each participant was placed for efficiency and prevention of waiting time. Before each appointment day, the research assistant calls the survivor or care giver depending on the telephone number of the person agreed at the initial assessment day. Also, those in the waiting list/control group were often called once a week to ask about the general well being. The treatment strategies available under this protocol, as earlier stated, was Cognitive Rehabilitation therapy (CRT), Psycho education therapy (PET) and Control/waiting list. Furthermore, those in the experimental groups CRT and PET were informed at the beginning of the sessions that if there are problems with transportation to the hospital on any appointment day which coincides with the psychotherapy session, they will be reimbursed a sum of ₦200. Less than half of the

participants asked for the reimbursement at least once and none asked for it more than 4 times, though the researcher asks them about this at the beginning and end of every session. The CRT and PET sessions were run for each client for 9 weeks with each session having a 45minutes – 1hour duration. Out of the 30 respondents for the experimental groups only 4 dropped out which were replaced by those on waiting list. A fair number of the respondents in the experimental study still come to the therapy site to ask questions and appreciate the therapy done.

3.7. Exclusion/inclusion criteria for patients from the cohorts were the following reasons:

Exclusion:

- If they had a major psychiatric disorder other than affective disorders (for example, schizophrenia or a current psychotic episode);
- If they had reported a depressive episode in the weeks before the time of the stroke/myocardial infarction;
- If they had a co-morbid intracerebral disease;
- If the clinician judged that they were unable to understand the informed consent procedure (for example, because of severe aphasia or dementia) after having administered the mini-mental state examination (MMSE) and the Barthel Index.
- If the patient level of exposure to education cannot sustain executive function discussion.

Inclusion:

- Patient must be having first ever stroke
- If participants were given written informed consent, this was approved by the UI/UCH medical ethics committee and accepts to be in the study.
- The respondents had filled the physical disability, perceived social support, health related quality of life and depression inventory scale. The responses were later looked into to check those who had fulfilled the criterion of the study to be included. All in three stages of pre-treatment assessment, psychotherapeutic intervention and post treatment assessment were carried out for the cognitive rehabilitation therapy and psycho – education. While the no treatment group had no psychotherapeutic intervention but post assessment

3.8. The sessions (modules)

Cognitive Rehabilitation therapy (CRT) places more demands on patients, but this heightened involvement has several distinct advantages. It can increase confidence in the patient to prevent, manage, and cope with the pain of stroke, which in turn can lead to reductions in post-stroke depression -related disability. Further, patients who attribute improvement to their own efforts (Versus a medication) reveal better long-term maintenance. Cognitive Rehabilitation therapy CRT has an extensive base of evidence, including support from reviews completed by many expert panels, The American Stroke Association noted instances where CRT warranted special consideration: when patients prefer a nondrug approach (which is increasingly becoming the case); drug treatment cannot be tolerated or is medically contraindicated; response to drug treatment is absent or minimal; there is a history of frequent or excessive use of prescription drugs or other acute medications; and there is significant life stress or the patient has deficient stress-coping skills.

A pre-intake individual general interview was usually conducted with each group candidate and most especially the lead care giver. This serves several important functions. First it helps form a bond between the therapist and the intending participant in the study. Secondly it allays the fear of each participant and gives understanding of the treatment goals and beneficial potentials of the therapeutic relationship. Thirdly, understanding of the purpose makes staying in therapy for the 9 weeks possible. Fourthly, it allows the therapist to identify individuals with sufficiently high levels of distress or disturbance that should be referred for immediate individual treatment and use of other things to enhance therapy and follow through. Finally, the initial interview allows the therapist an opportunity to identify and refer those few individuals with serious mental health conditions for whom the group may not be the most appropriate form of treatment.

The patients were told what made the treatment plan different and set their own goal for the therapeutic exercises and when at variance with therapy ideals, limitations and expectations of psychotherapy are made known. Other topics discussed at the initial interview included the time and circumstances of diagnosis, past and planned treatment, current emotional and psychological functioning, pre-existing and current life stressors, family and living circumstances, and prior experience with psychotherapy and groups. Asking about the patient's responses to prior difficult experiences to get a sense of coping resources and style was also done. Availability of support in the patient's life, presence of a primary partner and obtaining a sense of who provides the support was also assessed. At the outset, the care givers role was already clearly outlined. The level of support experienced in the primary relationship as well as any difficulties in the relationship was usually briefly assessed. This is due to the fact that relationship issues may be more easily disclosed

in a one-on-one setting. Then patient is then able to bring this up later during the course of the intervention because this has been discussed with the therapist.

The treatment was usually 45 minutes – 1hour weekly meeting for 9 weeks with a trained assistant (who does the assessments and follow-ups, making sure the participants make the meetings etc). Guidelines and ground rules were highlighted and agreed upon with the patients during the intake, which includes boundaries and mutual agreements regarding participation, since this is crucial to the therapy's effectiveness, seriousness and create a basis for mutual trust.

Throughout the 9 weeks of the individual therapy, each session would include the following basic elements: opening discussions, check-in-discussion, discussions about session's purpose, review of assignments, session topic, week's assignment and closing relaxation. The basic elements and time line is shown below. These basic elements become part of a therapy routine, contributing to the development of a therapeutic bond and a sense of sessions (therapy) as a safe container for participant's feelings and issues.

Minutes	**Process/ activity**	**Approximate Duration**
0	Review of previous week assignment * Except for first session.	10minutes
10	Close door begin – relaxation (six seconds deep breathing relaxation technique)	5 minutes
15	Check in	10minutes
25	Day activity/ discussion	35 minutes
60	Review of next session	10 minutes
70	Closing relaxation	10minutes

Modules of post-stroke depression focused - Cognitive rehabilitation therapy (further adaptations for each client was done)

Outline of sessions

In Session 1-PSYCHO-EDUCATION, KNOWLEDGE AND RULES OF THERAPY (with incorporation of care givers in as many who have them from the outset)

- The rules of therapy are the first part of the therapy- explaining the goals of the Cognitive Rehabilitation Therapy (CRT) and the specific roles of the patients in the therapy sessions. Session concepts, the entry and exit rules. * About 5 minutes

- Clinical psychologist/researcher introduces study logistics, discuss common emotional and physical aspects of stroke recovery, and present a rationale for treatment. * About 5 minutes

- Realistic expectations for what could be expected, given the nature of the stroke are discussed and participants are encouraged to identify their goals for treatment. This is particularly important as participants have varying levels of understanding as to what is and is not realistic. Participants are given (Nigerian adapted Strokes Knowledge Pamphlets) reading materials to help them understand stroke recovery and are asked to complete "The Pleasant Events Schedule" to facilitate discussion of pleasant events in subsequent sessions. * About 45 minutes

Note: Care givers for the stroke survivors are going to be fully integrated into the therapy process from the beginning of the sessions.

Assignment: Daily Living Mood Diary

Session 2- ASSESS PROBLEMS AND IMPROVE PROBLEM SOLVING SKILLS AND BUILD PLEASANT EVENTS

- Patients define problem(s) in their own ways and determine level of severity. Brainstorm all plausible solutions and identify the outcomes in relation to the various

solutions, then make a decision that best fits the demand of the problems (About 35 minutes)

- Introduces the concept of 'Pleasant Events' and discusses the importance of identifying pleasant events that are realistic given the physical and cognitive consequence of the individual patient's stroke. The relationship between depression and a lack of pleasant activities for the person with stroke is discussed. The Pleasant Events Schedule is used to identify activities that the person with stroke might enjoy, based on what they enjoyed in the past. (30 minutes)

Assignment- A daily mood and activity form is introduced at this session to help patients and their caregivers track their experiences. (About 5 minutes)

Assignment: Daily Living Mood Diary

Session 3- DISTORTED THINKING AND IMPAIRED SOCIAL INTERACTION

Review of the daily mood and activity form (5 minutes)

- Identification of the thinking patterns possible with negativism, also validate the experiences of stroke patients by explaining with the Activating event, Behavior and Consequences cycle (ABC) of thinking. Educate regarding positive self affirmations and use of flash cards.

Clarify rational versus irrational thinking. (35minutes)

- Convey acceptance and positive regard in using interactions to patient's advantage, teach assertive communication skills, and offer alternative responses for dealing effectively with stress provoking situations (20minutes)

Assignment- Role plays and practice social skills for reinforcement and increase insight on how thinking and social interaction relate. (15minutes)

Assignment: Daily Living Mood Diary

Session 4- UNDERSTANDING DYSFUNCTIONAL COPING ADHERENCE AND REASSURANCE

- Continues the Pleasant Events Schedule discussion, focusing on ways to plan and schedule pleasant events. Coping with the importance of understanding current limitations and working through those limitations is underscored, along with practical advice regarding activity engagement and methods of problem-solving around obstacles to activity and teaching relaxation techniques to use if feeling overwhelmed. (About 30minutes)

- Explain adherence, understand change and its stages in helping to adhere to drug and other treatment programs. Understand the situation on hand is a time for action; learn how to take action practically in consonance with abilities of the patients (support and reinforce medication compliance as self care behavior). (About 20minutes)

- Reassure patients. Ask patients on their specific fears about the future and positively encourage on the brighter side of life and look into the possibilities that things can still improve and life could be back to what it had always been and better.(About 15 minutes) Assignment: Daily Living Mood Diary

Session 5- CARE GIVERS BURDEN, DAILY LIVING AND SELF CARE

- Focuses on care givers burden and how they and the patients can work on the illness / situation without necessarily burnt out. Discussions are also centered on how to care without burnout for the informal caregiver, if such caregivers have opted to be part of the treatment. Topics such as caregiver burden and depression are addressed with the caregiver and resources that might help them help themselves are discussed. Researcher/clinical psychologist encourage caregivers to identify areas where they need or want more support and help them identify people and resources to enrich the

care network, including both informal support from family and friends and formal support from social welfare centers, domestic help services, and health care providers. They also discuss the importance of advance planning to identify resources that would be available in an emergency (e.g. illness or hospitalization). (35 minutes)
Assignment: Daily Living Mood Diary

- Patients to identify specific care they are unable to carry out for themselves whether it is important or not to them. Teach basic hygiene (bathe/shower, brushing of teeth, combing the hair, shaving etc) – when to seek assistance, learn that assistance is not gravely disabled. (25 minutes)

Assignment: Daily Living Mood Diary.

Session 6- BUILDING SELF WORTH AND CONFIDENCE THROUGH PROBLEM SOLVING

This addresses basic principles of behavior change, identifying problems of the participant's choosing. Participants are taught to pinpoint a problem, gather information about it, and discover what potential antecedents that triggered the problem or consequences that maintained the problem might be. They are then helped to set realistic goals for problem-solving and establish a plan. Using examples from the participants' weekly diaries, the participant and researcher/ clinical psychologist brainstorm strategies to modify antecedents or consequences and develop behavior change plans for the following week. At subsequent sessions, researcher/ clinical psychologist reviews these plans, evaluate progress, modifying and adjusting strategies as needed.

Assignment: Building a worksheet of problems and how to solve them and Daily Living Mood Diary. (All activities about 60 minutes)

Session 7- COGNITIVE RESTRUCTURING AND SEXUAL ISSUES

- Focuses on altering negative thinking so common in depressed individuals. Participant are encouraged to keep track of negative statements they find themselves making and track when this happened, how often, and around what situation and people. They are then encouraged to brainstorm possible ways to change their negative thinking to more positive strategies. (35 minutes)

- While also focusing on sexuality and sexual functions/alternate sexual patterns with partners. There will be education on myths in sexuality, understanding how illness had impacted their sex life. Explore partners' sensitivity and care to client's feelings and needs. Explore goals and invest partner as a support and agent of positive outlook (40 minutes)

Assignment: Daily Living Mood Diary

Sessions 8- SPIRITUALITY AND MEANING OF THE STROKE, SELF ESTEEM BOOSTING

This focuses on the spiritual belief and superior power in the life of the depressed individuals. The patient is encouraged to increase the activities associated with his/her higher power and keep track of the wordings in their sacred book that talks on promises during illness and its specific meaning to the survivor. (Flash cards will be made by each patient for personal use). (35 minutes)

Self esteem and concept of worth, competence and acceptance, the goal of this sub session will be to view themselves individually as a person who affirms a sense of worthiness. We describe the behaviors associated with having a positive attitude, i.e.

to list past accomplishments. The patients will be taken through the process of '10 self esteem boosters' (35 minutes)

Assignment: Daily Living Mood Diary

Session 9- SUMMARY AND REPLASE PREVENTION

This session serves as a summary of progress made as well as a structure for insuring continued improvement. Participants again rate the frequency and their reactions to "target" behaviors identified in the first session. Interventionists and participants review treatment gains, identified skills and strategies the participants plan to continue using, and develop workable plans for implementing or maintaining these strategies. Finally, a relapse prevention strategy is implemented with highlight of treatment gains, behavioral learning and rehearsals. (60 minutes)

Note: See appendix D for details of step by step of each module.

3.9 Data Analysis

Responses to the questionnaires were coded and entered into the SPSS (version 13) and SPSS was used in the analyses. Hypothesis was tested using T-test, hypothesis 2 with one way (Analysis of Variance)ANOVA, hypothesis 3 and 4 with multiple regression analysis , five with 2x2 ANOVA, six with T-test, seven and eight with multiple regression , nine with binary regression and ten with t-test, eleven with (Analysis of Covariance) ANCOVA.

CHAPTER FOUR

RESULTS

4.1. Descriptive

4.1. (a) Prevalence

The prevalence of post-stroke depression in the study was 35 survivors who had a score of 11 or above during the time of the study and were interested in completing the questionnaires, see fig 4.1. This number implies that that there is a prevalence of about 39% in the hospital based population.

Fig 4.1.Prevalence of Post-stroke depression

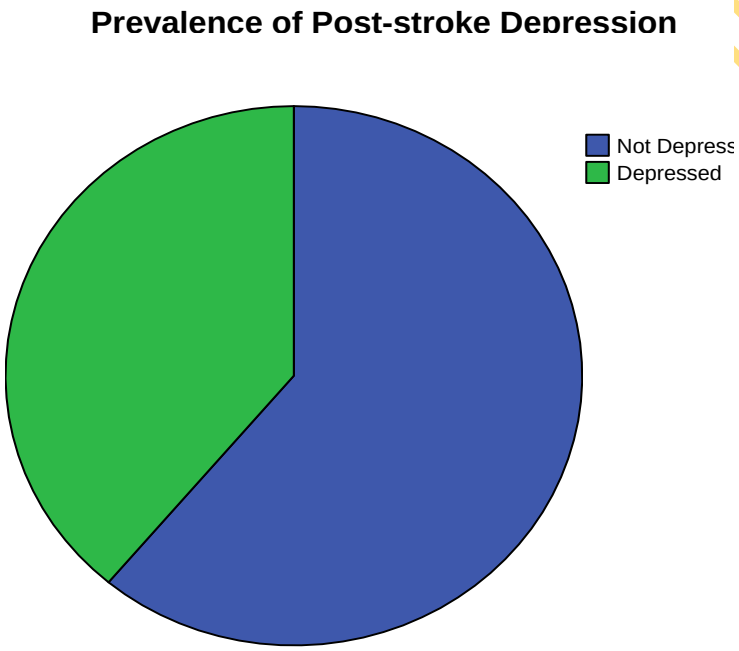
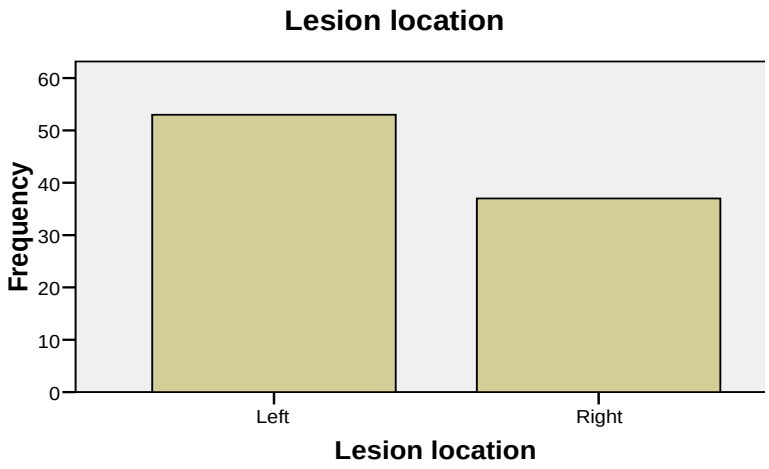


Figure 4.2 Frequency of side of Lesion Location.



The figure 4.2 showing the frequency of left sided people with lesion location as 53 people while right sided people as 37. There are more people with left sided lesion than right sided lesion in the study.

Figure 4.3 Frequency of concordance

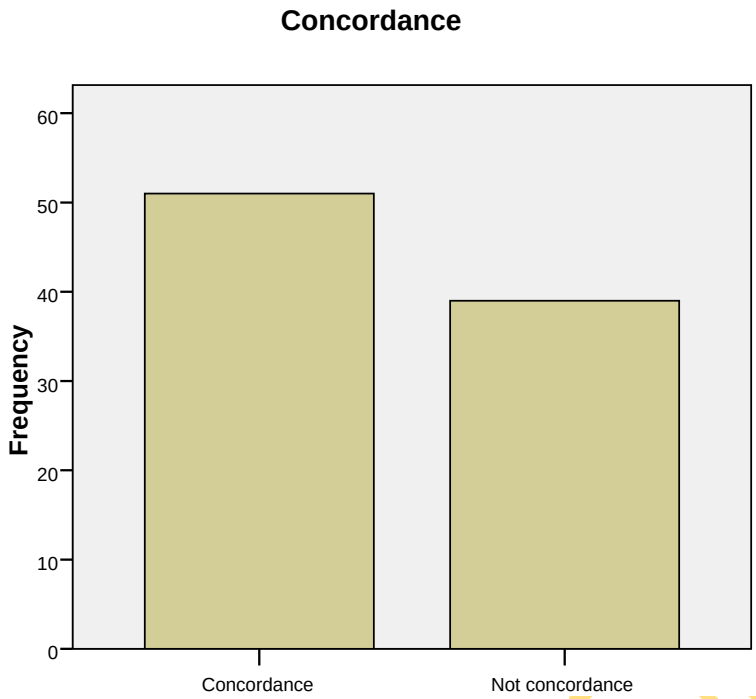
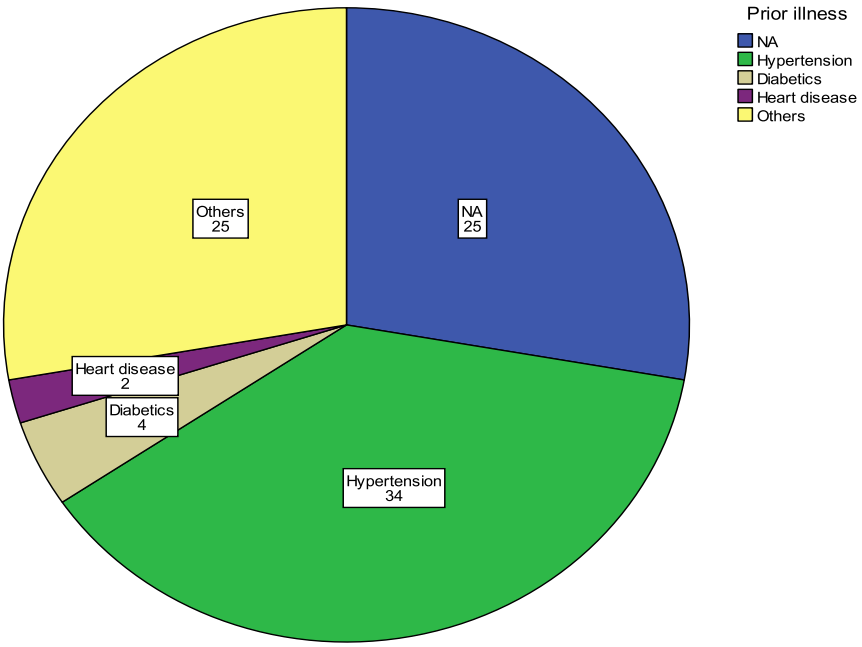


Fig 4.3 showed that concordance of stroke survivors in the study were higher than those without concordance with 51 stroke survivors having concordance than 39 people who are without concordance.

Table a4.1.1: Concord * Level of Depression Crosstabulation

		Level of Depression		Total
		Not Depressed	Depressed	
Concord	Concordance	32	19	51
	Not concordance	23	16	39
Total		55	35	90

Figure 4.4. Prior illness of post-stroke survivours



* NA(do not have or know the prior illness before the stroke attack)

Others (more than one combinations of illnesses)

This pie chart shows the frequency of distribution of the prior illnesss the stroke survivors had before the stroke itself : 34 of the survivors (37.8%)had a history of hypertension before the illness, 25 (27.8%) do not have any illness/ do not know he has an illness, another 25 (27.8%) had more than 1 or the combinations of illnesses, while 4 (4.4%) had diabetics and 2 (2.2%) had heart diesease. This shows us that blood pressure seem to likely predict stroke more than other illnesses, however, a major source of concern is that many people do not understand what they are feeling yet do not go to the hospital untill they are struck by the preventable diesase of stroke which make up the 25(27.8%) N/A. This lays a big task at the hands of the health care workers in the area of health care promotions and disease prevention.

Fig 4.5 Gender and post-stroke depression

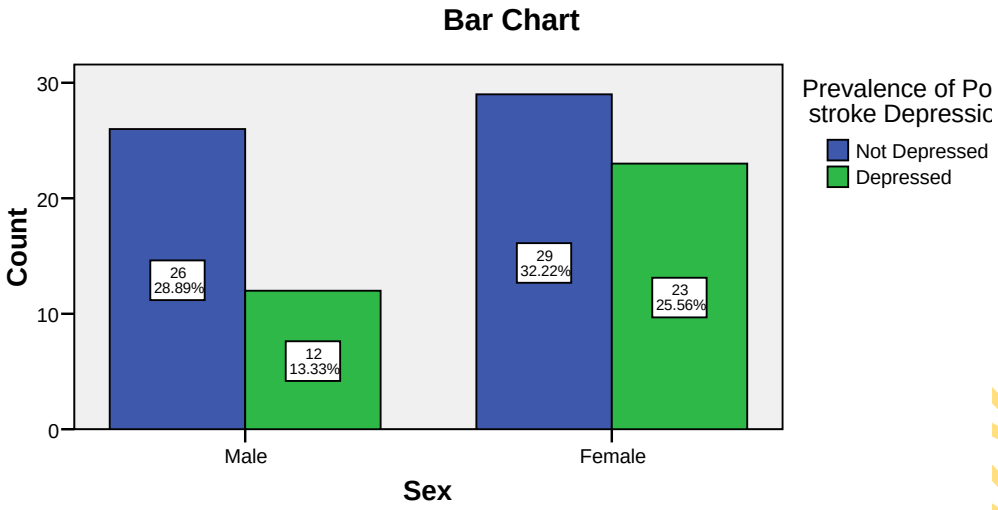


Fig. 4.5 Showing the number of females and males in the study, with females having 57.78 percent (52) while males had 42.22 (38). Furthermore, the ration of depressed to non- depressed in the males are 1:2.1 while for females it was 1:1.2. Showing that for every non-depressed female there is almost a depressed female.

Fig: 4.6 Showing gender and lesion location after stroke

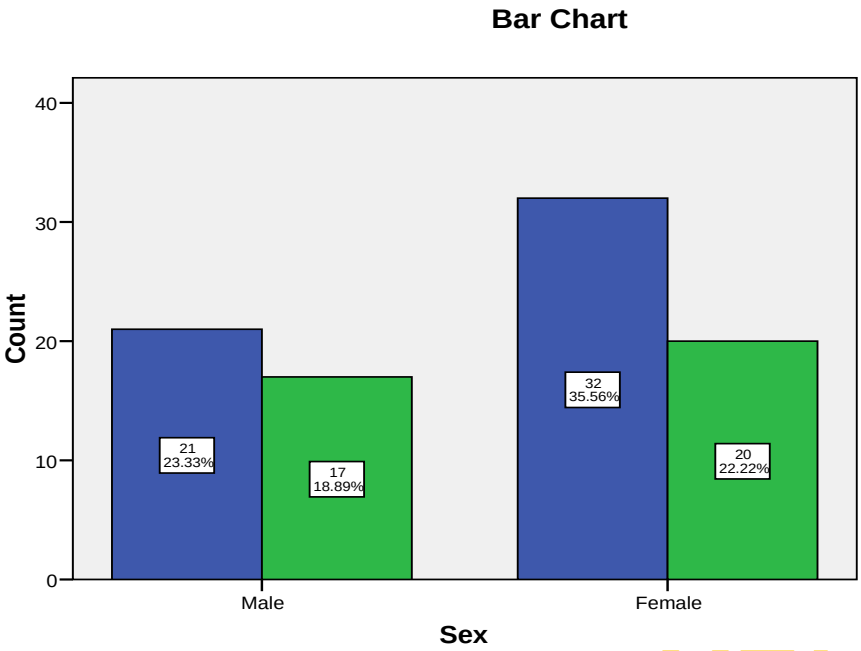


Figure 4.6 showing the location of lesion after stroke and gender. The result showed 21 males (23.33%) with left sided lesion with 17(18.89%) with right sided stroke lesion and the females having 32(35.56%) with left sided stroke lesion with 20(22.22%) with right sided lesion.

Fig 4.7 Showing religion among the post stroke survivors

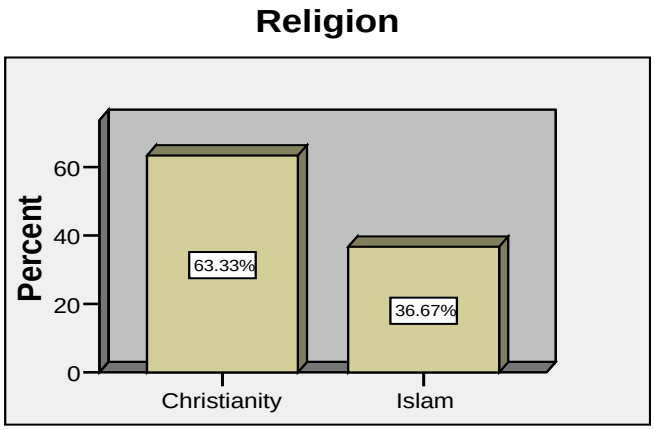


Fig 4.7 showing the spread of religious groupings in the stroke population with the Christians having about 63.33 (57) while Muslims having 36.67% (33).

Fig. 4.8 Showing academic status of the Stroke survivors

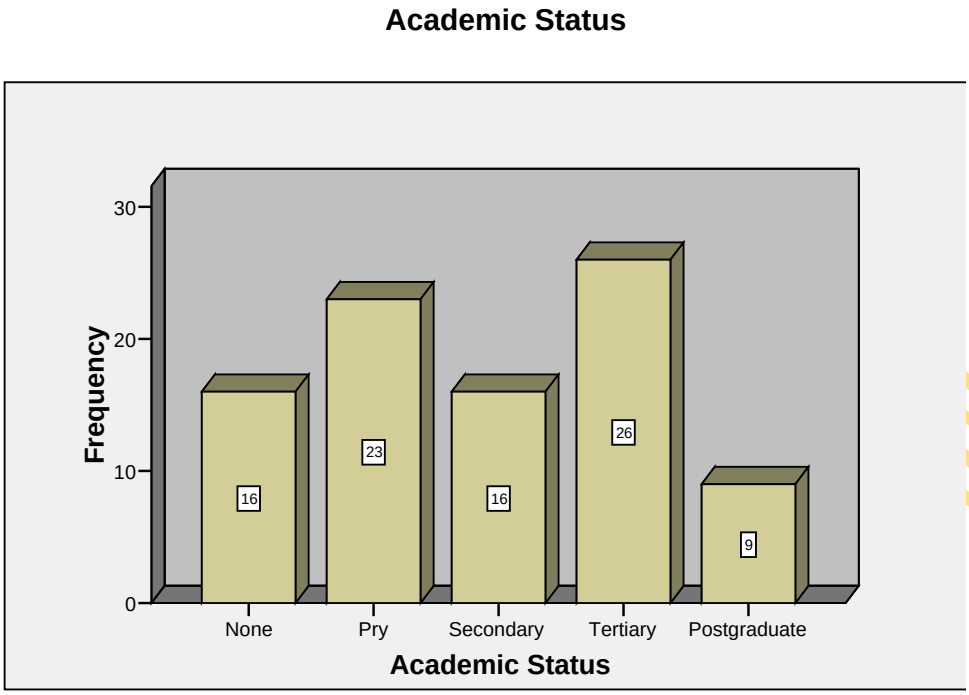


Fig. 4.8 Showing the distribution of academic status in the stroke population, the people without any academic education were 16 (17.8%), only pry education 23(25.6%), only secondary education 16 (17.8%), only tertiary 26(28.9%) and the at least doctoral degree 9(10%).

Table a4.1.2: Physical dependence and post stroke age group

Age group	Level of Dependency	Mean	Std. Deviation	No(%)
Young	Dependent	1.50	.707	2
	Independent	11.80	7.79	25
	Total	11.04	7.98	27
Old	Dependent	11.38	8.48	8
	Independent	9.04	5.99	55
	Total	9.33	6.33	63
Total	Dependent	9.40	8.57	10
	Independent	9.90	6.69	80
	Total	9.84	6.87	90

Fig 4.9 Age range in decades and location of lesion

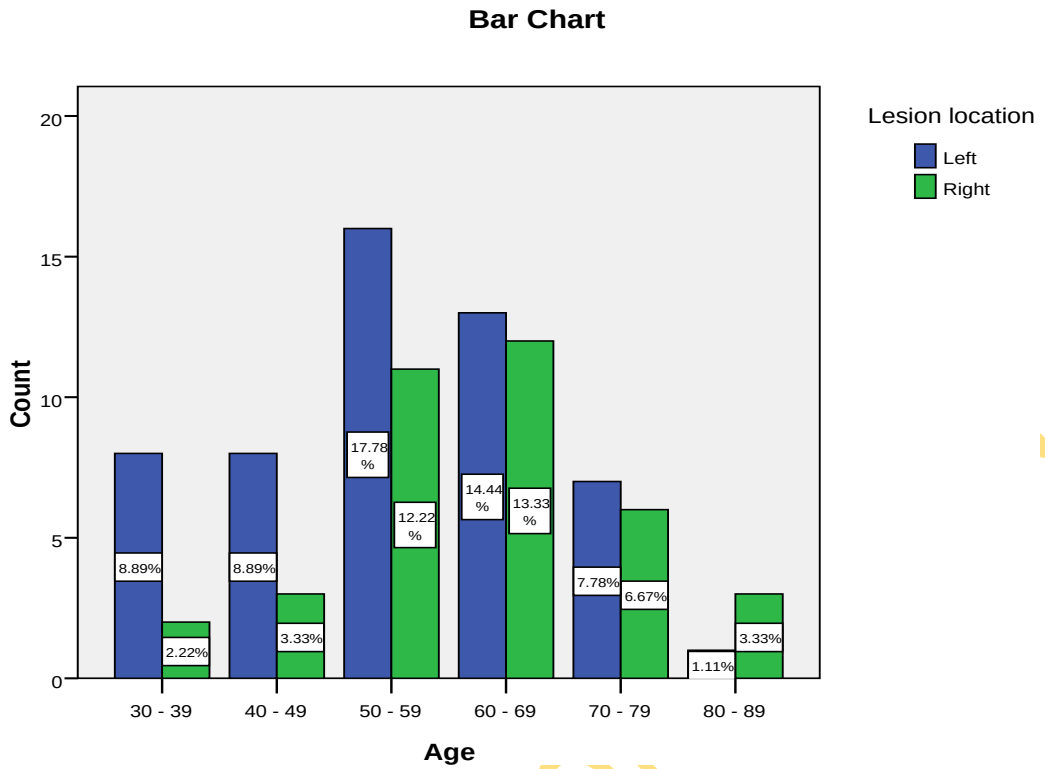
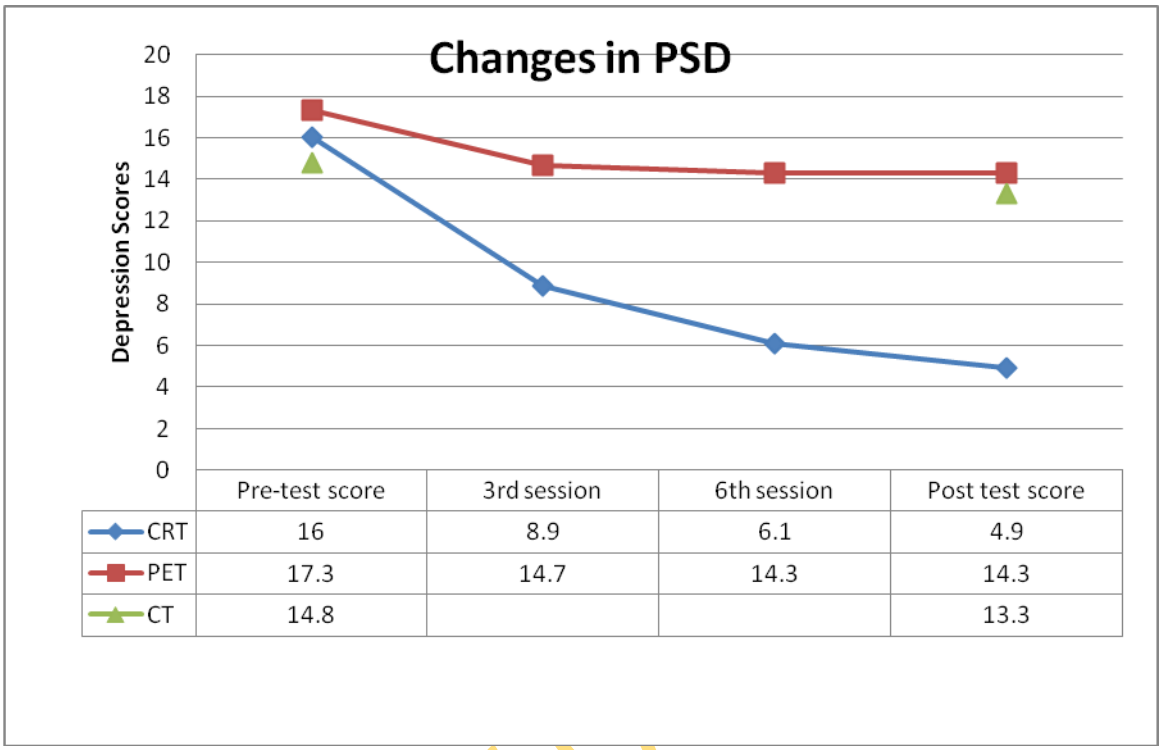


Fig 4.9 Showing the age ranges and the distrubtion of lesion location. The age range of total population having either side of the lesion are 30-39 had a 8.89% left sided lesion and right of 2.22% while40-49had 8.89% left and 3.33% right sided lesion, 50-59 with 17.78% left side and 12.22 right, 60-69 14.44% left and 13.33 right, 70-79 having 7.78% with left and 6.67 right sided and finally, 80-89 having 1.11% left and 3.33% right sided lesion of the total population.

Fig 4.10. Changes of Post-stroke depression at Pre and Post –test showing changes of stroke surviors of each therapy group at different points



	Pre-test score	3rd session	6th session	Post test score
CRT	16	8.9	6.1	4.9
PET	17.3	14.7	14.3	14.3
CT	14.8			13.3

At pre-test, the different groups of the study namely CRT (Cognitive Rehabilitation therapy), PET (Psycho-Education Therapy group) and the CT (waiting list Control Therapy) had a pre-test group mean score CRT = 16, PET=17.3 and CT=14.8. By the second session the mean score for the CRT was almost half while the PET marginally reduced to 14.7 and at the 6th session of about 2 moths plus the mean score was less than no significant score on the BDI of 6.1 for the CRT group while the PET was stable while at post-test CRT was 4.9, PET 14.3 and control 13.3 showing the curve of treatment efficacy for the CRT.

(b) (i) Correlations

Table b4.1.3: Correlation between post-stroke depression (BDI) and post-stroke depression (HADS)

		Post-stroke depression	Depression(HADS)
Post-stroke depression	Pearson Correlation	1	.206
	Sig. (2-tailed)		.052
	N	90	89
Depression(HADS)	Pearson Correlation	.206	1
	Sig. (2-tailed)	.052	
	N	89	89

The table b4.1.3 showed correlation between post-stroke depression as measured by the Becks Depression Scale and the Hospital Anxiety and Depression Scale(HADS), however, the corelation was not significant ($r=0.21, p>.05$). This suggests that though there was a correlation in the two measures however, it was not significant. This will most likely result from the added anxiety component of the HADS which skews the measure.

Table b4.1.4: Correlation between Post-stroke depression and Post stroke anxiety

		Post-stroke depression	Anxiety
Post stroke depression	Pearson Correlation	1	.434**
	Sig. (2-tailed)		.000
	N	90	89
Anxiety	Pearson Correlation	.434**	1
	Sig. (2-tailed)	.000	
	N	89	89

**. Correlation is significant at the 0.01 level (2-tailed).

There was correlation between the post-stroke depression and post stroke anxiety in survivors as was shown in Table 11 (r=.434,p>.05). This suggests that post-stroke depression and anxiety are related in the study and this has implication for psychotherapy (Cognitve Rehabilitation Therapy) which means that as the depression in the survivors reduces then the post stroke anxity will be reducing. This is similar to results of other studies.

4.2. Hypothesis Testing

Hypothesis one which states that stroke survivors with left hemispheric brain lesion will report significantly higher level of post – stroke depression than those with right hemispheric brain lesion was tested with the independent t-test statistics and the result is presented on table 4.1.

Table 4.1: Summary of independent t-test comparing brain lesion location on Post-stroke depression

	Lesion Location	N	$\bar{x}$	SD	df	T	P
Post stroke depression	Left	53	9.77	7.23	88	-0.12	>.05
	Right	37	9.95	6.30			

Table 4.1 shows no lesion location difference on post-stroke depression among stroke survivors (t = -0.117; df = 88; p> 0.05). This insignificant difference can be observed in the mean where stroke survivors with left lesion scored ($\overline{X}$ =9.77) on post-stroke depression while stroke survivors with right lesion scored ($\overline{X}$ = 9.95) with a mean difference of -0.172. Based on this, stroke survivors who have left lesion were not significantly different from those who have right lesion on post-stroke depression. Therefore, the hypothesis is not confirmed.

Hypothesis two states that ischemic stroke will significantly influence post-stroke depression of the survivors than hemorrhagic or mixed type of stroke was tested using one way ANOVA in table 4.2

Table 4.2 Summary of one way analysis of variance comparing different types of stroke on Post-stroke depression

Source of variation	SS	Df	MS	F	P
Between	89.87	2	44.93	2.24	>.05
Within	642.13	32	20.07		
Total	732.0	34			

The result of the analysis showed that there was no significant differences in the levels of post-stroke depression among the stroke survivors who are have ischemic stroke, hemorrhagic or mixed type of stroke F (2, 27) = 8.639; p>05. Hence the hypothesis is rejected.

Hypothesis three states that females will have significantly higher post-stroke depression than males in stroke survivors was tested with T-test. The result is presented in Table 4.3.

Table 4.3 Summary of independent t-test comparing stroke survivors' gender on Post-stroke depression

	Gender	N	$\bar{x}$	SD	df	T	P
	Female	23	17.09	5.20			
Post stroke depression	Male	12	16.83	3.35	33	.15	>.05

Table 4.3 shows that type of gender has no significant influence on post-stroke depression among survivors of first stroke attack (t = -.15; df = 33; p> 0.05). This can be seen that despite the higher mean in the female ($\overline{X}$ = 17.09), however, it was not of statistical significant therefore the hypothesis is rejected.

Hypothesis Four states that there will be significant independent and joint influence of location of brain lesion, physical disability and stroke levity on post-stroke depression of the survivors was tested using multiple regression analysis. The result is presented in table 4.4.

Table 4.4: Relative contribution location of brain lesion, physical disability and stroke levity on Post-stroke depression among stroke survivors

Model	R	R^2	F	P	Beta (β)	t-value	P
Physical disability					0.254	1.330	>.05
Stroke levity	0.268	0.072	0.673	>.05	-0.089	-0.447	>.05
Location of brain lesion					-0.69	-0.342	>.05

Table 4.4 shows that location of brain lesion, physical disability, stroke levity did not predict post-stroke depression jointly [F (3, 26) = 0.673, p>.05]. The R value of 0.268 shows a low relationship between the independent variables and post-stroke depression, also, the R^2 value of 0.072 shows that the independent variables contributed about 7.2% to the variation of post-stroke depression. The independent influence of the predictor variables shows that none of the independent variables predicted post-stroke depression independently. Based on these results, the hypothesis was not supported.

Hypothesis five states that there will be a significant interaction effect of age group and level of physical dependency on post-stroke depression among the stroke survivors was tested with 2X2 ANOVA. The result is presented on table 4.5 and 4.6.

Table 4.5: Summary of descriptive statistics showing the influence of age and physical dependency on Post-stroke depression among stroke survivors in Ibadan

Age	Dependency	Interaction	$\overline{X}$	STD	N	Ranking
Young	Dependent	YD	1.50	0.70	2	4th
	Independent	YI	11.80	7.79	25	1st
Old	Dependent	OD	11.38	8.48	8	2nd
	Independent	OI	9.04	5.99	55	3rd

Key:

YD = Young, Dependent

YI = Young, Independent

OD = Old, Dependent

OI = Old, Independent

Table 4.5 reveals that young participants with physical independency (YI) had the highest mean score ($\overline{X}$ = 11.80) on post-stroke depression. This means that young participants who are independent (YI) are high on post-stroke depression. They were ranked first. This is followed by old participants with physical dependency (OD) with mean score ($\overline{X}$ = 11.38) on post-stroke depression. They were ranked second.

Table 4.6 Showing 2X2 ANOVA effects of age and physical dependency on Post-stroke depression among the stroke survivors

Source	SS	DF	MS	F	Sig.
Age(A)	74.02	1	74.02	1.631	0.205
Dependency (B)	94.78	1	94.78	2.044	0.156
A * B	233.81	1	233.81	5.150	0.026
Error	3904.30	86	45.39		
Total	4193.82	89			

The result in Table 4.6 shows that there were no significant main effects of age and physical dependency on post-stroke depression [F (1, 86) = 1.631, p> .05 & F (1, 86) = 2.044, p> .05] respectively on post-stroke depression. However, the interaction effect of age and physical dependency on post-stroke depression was significant [F (1, 86) = 5.150; p< .05]. Based on these results, the hypothesis was confirmed.

Hypothesis six states that stroke survivors with low level of perceived social support will report significantly higher on post-stroke depression was tested with the independent t-test statistics and the result is presented on table 4.7

Table 4.7 Summary of independent t-test comparing stroke survivors' social support on Post-stroke depression

	Social support	N	$\bar{x}$	SD	df	T	P
Post stroke depression	Low	14	17.14	4.17	28	1.25	<.05
	High	16	15.50	2.99			

Table 4.7 shows that social support has significant influence on post-stroke depression among stroke survivors (t = 1.252; df = 28; p< 0.05). This significant difference can be observed in the mean where stroke survivors with low social support scored higher ($\overline{X}$ =17.14) on post-stroke depression than stroke survivors with high social support ($\overline{X}$ = 15.50) with a mean difference of 1.64. Examination of the table shows that, stroke survivors who have low social support scored higher than those with high social support. Therefore, the hypothesis was confirmed.

Hypothesis seven which that states that patients' type of locus of control will jointly and independently predict level of post-stroke depression was tested using multiple regression analysis. The result is presented in table 4.8.

Table 4.8: Relative contribution patient's locus of control on Post-stroke depression among stroke survivors

Model	R	R^2	F	P	Beta (β)	t-value	P
Internal					0.328	1.667	>.05
Chance	0.414	0.171	1.292	>.05	-0.150	-0.817	>.05
PO Doctor					0.188	0.649	>.05
PO Others					-0.461	-1.578	>.05

Table 4.8 shows that patients' type of locus of control (Internal, chance, perceived others doctor and perceived others, others) did not predict post-stroke depression jointly [F (4, 25) = 1.292, p>.05]. The R value of 0.41 shows a moderate relationship between the independent variables and post-stroke depression, also, the R^2 value of 0.171 shows that the independent variables contributed about 17.1% to the variation of post-stroke depression. The independent influence of the predictor variables shows that none of the independent variables predicted post-stroke depression. Based on these results, the hypothesis was not supported.

Hypothesis eight states that academic status, religion, age and gender will independently and jointly will independently and jointly predict post-stroke depression among survivors was tested with multiple regression. The result is presented on table 4.9.

Table 4.9: Relative contribution academic status, religion, age and gender on Post-stroke depression among stroke survivors

Model	R	R^2	F	P	Beta (β)	t-value	P
Academic status					0.14	1.16	>.05
Religion	0.209	0.043	0.97	>.05	0.03	0.026	>.05
Age					-0.06	-0.52	>.05
Gender					0.15	1.30	>.05

Table 4.9 shows that patients' academic status, religion, age and sex did not predict post-stroke depression jointly [F (4, 25) = 0.97, p>.05]. The R value of 0.21 shows a low relationship between the independent variables and post-stroke depression, also, the R^2 value of 0.04 shows that the independent variables contributed about 4.3% to the variation of post-stroke depression. The independent influence of the predictor variables shows that none of the independent variables predicted post-stroke depression. Based on these results, the hypothesis was not supported.

Hypothesis nine states that gender, age, occupation religion, stroke type, prior illness , concordance and lesion location will significantly predict location of post-stroke depression among survivors was tested with binary regression analysis and the result is presented in table 4.10

Table: 4.10 Prediction of age, gender, occupation, religion, stroke type, concordance, prior illness and location of lesion location on post-stroke depression among stroke survivors

			Score	df	Sig.
Step 0	Variables	Sex	1.082	1	.298
		Age	6.067	1	.014
		Occupation	21.132	14	.098
		Occupation(1)	1.383	1	.240
		Occupation(2)	5.642	1	.018
		Occupation(3)	.796	1	.372
		Occupation(4)	.579	1	.447
		Occupation(5)	.724	1	.395
		Occupation(6)	1.826	1	.177
		Occupation(7)	1.826	1	.177
		Occupation(8)	1.826	1	.177
		Occupation(9)	1.826	1	.177
		Occupation(10)	1.826	1	.177
		Occupation(11)	.564	1	.453
		Occupation(12)	.564	1	.453
		Occupation(13)	1.741	1	.187
		Occupation(14)	.564	1	.453
		Religion	2.890	1	.089
		EthnicGrp	.237	1	.626
		AcademicStat	1.826	1	.177
		Priorillness	1.916	1	.166
		LesionLoc	.022	1	.883
		StrokeType	.317	1	.573
		Concordan	.082	1	.775
	Overall Statistics		33.243	23	.077

Table 4.11 Prediction Classification Table[a]

Observed			Predicted		
			Prevalence of Post-stroke Depression		Percentage Correct
			Not Depressed	Depressed	Not Depressed
Step 1	Prevalence of Post-stroke Depression	Not Depressed	42	3	93.3
		Depressed	8	17	68.0
	Overall Percentage				84.3

Table 4.11 shows that stroke survivor's gender, age, occupation, religion, prior illness stroke type, concordance and prior illness did post-stroke depression. The coefficient estimates shows the Wald = (Age,4.48, Academic Status,.16, sex, .15, occupation 3.67, stroke type, 3.31, concordance, .14, Prior illness, .038) , The result indicate that the contributions into the post stroke depression in a stroke survivor has a prediction of sex, occupation, academic status, age, concordance, stroke type and prior illness which was significant at 0.01 level. Also, the relative contributions to the prediction could be seen as, stroke type (B=.85), occupation (45.60), as having the greatest influence on the model. Table 4.11 shows the correct cases as shown by the classification table that the prediction was right 84.3 percent of the time, therefore having a high sensitivity. Based on these results, the hypothesis was accepted.

Hypothesis ten states that stroke survivors who are exposed to cognitive rehabilitation therapy (CRT) will have significant reduction in their post – stroke depression at post-test than at pre-test than the waiting list control (CT) survivors was tested with the independent t-test statistics and the result is presented on table 4.12

Table 4.12: Summary of independent t-test comparing CRT and waiting list control on Post-stroke depression

	Therapy Type	N	$\bar{x}$	SD	df	T	P
Post stress depression	CRT	10	-11.10	3.107			
	CT	10	1.50	3.808	18	-8.107	<.001

Table 4.12 shows that type of therapy has significant influence on post-stroke depression pre-test and post-test (t = -8.107; df = 18; p< 0.001). This significant difference can be observed in the mean where stroke survivors in the CRT had a greater reduction ($\overline{X}$ =-11.10) in level of post-stroke depression stroke survivors than stroke survivors in the waiting list ($\overline{X}$ = 1.50) with a mean difference of -12.600. Examination of the result reveals that stroke survivors who were treated with the CRT reported greater reduction in the level of post-stroke depression pre-test, post-test than the stroke survivors who were on the waiting list (control). The hypothesis was therefore confirmed.

Hypothesis eleven states that stroke survivors who are exposed to cognitive rehabilitation therapy will have significant positive difference to the psycho education therapy and waiting list control on their level of post-stroke depression controlling for stressful events. This hypothesis was analyzed using analysis of covariance (ANCOVA) and the result is presented on table 4.13

Table 4.13 a Descriptive table of different levels of psychotherapy

Psychotherapy	N	Mean	Std. Deviation
CRT	10	4.90	2.07
PET	10	14.30	7.64
CT	10	13.30	5.45

Table 4.13b Summary of one way analysis of variance comparing different levels of psychotherapy on Post-stroke depression

Source of variation	SS	df	MS	F	P
Between	533.06	2	266.53	8.639	<.01
Within	833.10	27	30.85		
Total	1366.16	29			

Table 4.13 revealed a significant variation among the levels of psychotherapy on post-stroke depression F (2, 27) = 8.639; p<.01. This implies that the different levels of psychotherapy were significantly different on post-stroke depression; hence a post hoc analysis was carried out to find out where the difference is. The result of the post hoc analysis is presented on table 4.14

Table 4.14 Summary of post hoc comparison in mean of the different level of psychotherapy

Therapy	Therapy	Mean	Mean Difference	Sig
CRT	PET	14.30	-9.40	.001
	CT	13.30	-8.40	.002
PET	CRT	4.90	9.40	.001
	CT	13.30	1.00	.690
CT	CRT	4.90	8.40	.002
	PET	14.30	-1.00	.690

Table 4.14 shows the multiple comparison tables of the mean scores obtained by the different levels of psychotherapy. Examination of the table reveals that; difference in the mean score between CRT and PET (-9.40, $p<.05$) was significant, also, the difference in the mean score between CRT and CT (-8.40, $p<.05$) was significant, see fig 4.10. However, the difference in mean score between PET and CT (1.00, $p>.05$) was not significant.

Table 4.15 Showing summary of analysis of covariance (ANCOVA) when a stressful event is introduced as a covariate in the effect of levels of psychotherapy on Post-stroke depression

Source of variation	SS	df	MS	F	P
Stress	2.68	1	2.68	0.084	>.05
Therapy	470.21	2	235.108	7.361	<.01
Total	1366.16	29			

Table 4.15 shows the level of significance of levels of psychotherapy when stressful event is introduced as a covariate to the levels of psychotherapy. The result shows that before the introduction of the covariate, the value of levels of psychotherapy as seen on table 4.1a was [F (2, 27) = 8.639; p<.01] and when the covariate was introduced, the value of levels of therapy on post-stroke depression was [F (2, 27) = 7.361; p<.01]. This implies that the introduction of stressful events had no significant effect on level of psychotherapy; hence, stressful events did not co-vary with levels of psychotherapy to have effect on Post-stroke depression.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 DISCUSSION

In this chapter the focus will be on discussion of the results of the the study, the conclusions which can be drawn from them and recommendations from the results. The first pursuit of this research is to understand the prevalence of post-stroke depression among survivors, then have a clearer understanding of the factors which can contribute to the development of post-stroke depression, contribute to the literature on the post-stroke depression and possibly predict treatment outcome using cognitive rehabilitation therapy. Another, important thrust of this research is to contribute to the treatment of post –stroke depression using cognitive rehabilitation therapy and ensuring improved overall quality of life for the stroke survivors experiencing depression. Again, it is the aim of this study to develop a scale to measure psychological impact of stroke among survivors and examine the efficacy of the treatment package of the cognitive rehabilitation therapy on people with post-stroke depression.

5.1.1 Prevalence

In terms of prevalence, the incidence of post-stroke depression among survivors in the study was 38.9%, this is very much comparable to another hospital based sample in Nigeria of 40% in Ilorin (Wahab, 2008). However, both Nigerian prevalent estimates were relatively higher than the meta-analysis estimated value of pooled frequency of post- stroke depression even when several differences in studies across cultures were analyzed which was at 33% Hackett et.al, (2005), however, this was close to what Srivastava, Taly, Gupta &Murali, 2009, observed in their study

with 35.29%. Again, the study found gender differences in the population of survivors of stroke attack with more females with stroke attacks and in the group of those with post- stroke depression, females were more with males having 13.33% of post-stroke depression, while females have 25.56% this is almost twice the population of males. This is in confirmation of the available data about women using medical facilities more than men and the assertion that women have more depression and frequently prone to depressive tendencies than men which in literature had been severally attributed to gender based differences in brain functioning, limb system, cerebral organization of language (Paradiso et.al, 1998; Borod, 1992; Gur et.al., 1995, Shaywitz et.al 1995). Furthermore, the age range of the stroke survivors showed that people between the ages 50-69 are higher with stroke attacks with over 50% of the stroke attacks falling into this age range, this is also similar to the assertion of Marchione, 2011 that strokes are increasing seriously in young and middle-aged Americans while dropping in those older, a sign that obesity epidemic may be starting to reshape the age burden of the disease.

5.1.2 Lesion Location

In terms of location of brain lesion, the study discovered that there is no significant influence of left or right sided lesion in determining post-stroke depression in survivors. In other studies since the concept of lesion location and development of post –stroke depression began; there had been a lively debate with data from the early 1980s which suggested that there was a relation between proximity of the lesion to the frontal pole and depression. This appeared to have been contradicted by a meta-analysis published in the Lancet in 2000 by Carson et al. This analysis was further criticized by others on the grounds that the hypothesis was not specific enough and

that some relevant studies had been omitted. When a similar methodology was used but the data looked out separately for each hemisphere, there was a clear relation between proximity of the lesion to the left frontal pole and depression, especially in the first few months after stroke (Narushima, Kosier & Robinson, 2003). The results of this second meta-analysis were given further weight by a Finnish study Vataja, Leppavuori, Pohjasvaara, et al. (2004), which, also found that a brain infarct affecting the pallidum was a strong predictive factor for post-stroke depression (odds ratio 7.2). This finding also fits with case reports of dysphoria in relation to insertion of deep brain stimulating electrodes in the same area. In a recent study in Nigeria Oladiji et al. (2009), the relationship between stroke laterality and Post-stroke depression was highlighted with post-stroke depression more likely with patients who have their stroke lesion over the right hemisphere, however, this was inconsistent with studies such as Rao (2001); Singh et al.(1998). Furthermore, the result of this study is consistent with the well accepted study by Kadojic, Vladetić, Čandrlić, Kadojić, Dikanović & Trkanjec (2005) in which all of the patients hemispheric lateralisation of the brain lesion were registered with CT scan, discovered that with hemispheric lateralisation of brain lesion, emotional disorders are more expressed in the right hemisphere lesion than in the left. However, they noted the differences of their findings as well as of other preceding researches and stated that the findings were not statistically significant, which was similar to this study. However, Starkstein, Robinson & Price, (1987) suggested that aphasia does not cause depression, but the two may coexist. As yet, there remains no reliable method of assessing mood disorders for patients with severe comprehensive deficits (Sulaiman et al., 2002). This study also found that post-stroke depression was the same for both sides of the lesion in the hemispheres. This is in keeping with the results particularly by numerous

studies Herrmann et al. (1998); Pohjasvaara et al., (1998); Sinyor et al.(1986), however studies like Robinson's group and other investigators have confirmed this relationship. A recent review of a longitudinal study of post-stroke depression and lesion location reported that the most likely explanation for these conflicting findings is inter-study differences in the time patients were examined after stroke. Robinson,(2000) because this study studies survivors who are first ever patients and not time restrictive.

This study also showed a weak correlation between the lesion location, level of dependence and levity of the stroke with none of them predicting post-stroke depression also, none predicting depression singularly. The result of the analysis revealed no significant or joint influence of lesion location, physical disability and stroke levity on Post-stroke depression. Contrary to prediction, location of lesion did not predict post-stroke depression, the hypothesized relationship was based on Robinson et al. (1983); Robinson, Star & Price,(1984); Mayberg , Robinson et al. (1988); Robinson (2000) all who found relationships between lesion location and Post-stroke depression; However, this result is in conformation with studies such as Glamcevski et al. (2002) among Malaysian patients three to six months Post-stroke which showed side of lesion did not impact the prevalence of depression. Also, Sulaiman, Zainal, Tan & Tan(2002) also found no correlation between location of lesion and Post-stroke depression except one to two months after the stroke itself, while other studies failed to confirm the relationship Hermann et al .(1998); Pohjasvaara et al.(1998), Sinyor (1986) & Burvil et al.(1996). Furthermore, Sulaiman et al. (2002) found that a great majority of studies were done at 3 or more months following stroke when the frequency of depression following right hemisphere stroke was no different from that following the left hemisphere.

One of the central issues in post-stroke depression is whether it is organic or reactive in nature. The result of non of the sides of lesion predicting depression in the survivors support the notion of non-importance of site of lesion, and thus the importance of reactive factors. Also, the relationship between disability and post-stroke depression, support the importance of reactive factors. Perhaps the two are not exclusive Sulaiman et al.(2002); Lishman,(1987); suggested that reactive factors, those factors related to the lesion, pre-morbid personality, constitution as well as environment all played a role in the development of mental disability after brain injury.

5.1.3 Physical disability and stroke levity

Interestingly, physical dependence had often been associated with occurrence of Post-stroke depression but the current study does not confirm this which is in tandem with some other researchers. Hackett & Anderson (2005) in their study of the predictors of stroke (systematic review), found that though severity of physical disability is said to predict post-stroke depression evidence in their study did not allow for ready identification of patients most at risk of developing this important complication of stroke. Also, a recent study by Srivastava, Taly, Gupta & Murali (2010) in India showed that though depression is related to functional disability following stroke, the relationship did not reach statistical significance. The association of disability with post-stroke depression may reflect its effect on sustaining and possibly retarding recovery from-physical impairment, despite the fact that the majority of the previous studies have reported a significant relationship between disability and post-stroke depression (Paolucci, Gandolfo et al., 2006, Glodzik-Sobanska et. al., 2003, Parikh, Lipsey & Robinson, 1987).

However, when age and physical disability were examined, the study discovered younger survivors with physical disability had more post- stroke depression than older people with physical disability. Depression post stroke is associated with functional ability and may have a negative impact on recovery. Although patients with post-stroke depression may experience significant recovery, functional ability will remain at a lower level than non-depressed patients, despite rehabilitation interventions. Goodwin and Devanand (2008) demonstrated that co-occurrence of stroke and depression is associated with greater physical limitations than either condition on its own. Physical impairment and post-stroke depression appear to act upon each other, and each influences the recovery of the other. Also, stroke levity was not supported in this study as a significant predictor of post stroke depression in survivors. A study by Owolabi et al.(2010) in which predictors of generic and specific post –stroke related quality of life was investigated found that stroke levity was a component of physical health and impaired psychological health. Psychological dysfunction negatively influences domains of health. It is important to note that the results implicated that the variables physical dependence, stroke levity and lesion location played a role in the Post- stroke depression but was not of statistical significance in the study. Again, on the effect of age group and level of physical disability and it was discovered that younger survivors with physical disability had higher level of post-stroke depression than older survivors who had physical disability. Though there had been paucity of research finding in the area of age and level of dependency as a predictor of post-stroke depression as confirmed by Hackett & Anderson (2005). The findings of this study shows a result which is consistent with the few available such as Hackett et al. (2005) which found that

younger women and men with impairments in daily activities are more at risk of Post-stroke depression than older gender with impairments in activities of daily living.

5.1.4 Age, Religion, academic status

In terms of age, gender, religion, academic status it was revealed that age of a survivor, the gender of the survivor and the concordance of the impairment or prior illness is not the determinant of post-stroke depression among stroke survivors. The result of this present study brings to fore the fact that age is not the predicting factor in the development of post-stroke depression and that gender is not a determinant of post-stroke depression. This was at variance with the result of Paradiso, & Robinson (1998) which revealed that Post stroke depressive disorders is more frequent in females (at least in the type of population they studied) than males. Notably, in the present study there were higher number of females in the stroke population, higher number of females in the post –stroke depression population, however, it was not statistically significant in predicting post – stroke depression. Other studies have consistently refuted the finding that females are more frequent with post-stroke depression. There are other notable works such as the "Living Well study by Kohen, Cain, Buzaitis et al (2011) which found no significant main effects or interactions for gender, stroke severity and lesion location.

5.1.5 Perceived social support

It was observed in the study that perceived social support of stroke survivors impacted on the development and severity of post-stroke depression. The report further emphasized the importance of social support to chronic and disabling illness such as stroke and that the lower the support the higher the level of Post-stroke

depression. Several studies have investigated the relationship between perceived social support and post-stroke depression. In a recent study by Halley, Phan, Couchman & Monash (2012), investigating the dimensions of perceived social support and post – stroke depression they found perceived social support was independently linked with post-stroke depression. Another, significant work by Choi-Kwon, Han et al. (2012) which investigated the factors related to emotional incontinence after stroke and found perceived social support as part of the significant factors in Asian populations. Furthermore, Hilari et al. (2010), King (1996), found in different studies that perceived social support predicted quality of life and Post-stroke depression in stroke populations and concluded that to assist stroke survivors in coping there must be improvement in maintaining and strengthening their support systems. Finally, a large and consistent body of evidence involving both community and patient populations has demonstrated the beneficial effects of supportive social relationships on health of stroke survivors and this study found a similar result.

5.1.6 Locus of control

Locus of control had been touted has a factor that can significantly predict post-stroke depression, however, findings from this study revealed that though there was a moderate relationship, however, the loci's did not predict post-stroke depression individually and that the locus of control of stroke survivors' (internal, chance, powerful others Doctors and other powerful others) did not predict post-stroke depression independently. This result indicates that stroke survivors locus of control does not predict their depressive state irrespective of the one in which the survivor is higher or lower in but there might be a marginal inference from all the locus of control together but still does not predict the development of post-stroke

depression. This had been consistent with some studies which had investigated the relationship between post stroke emotionality and locus of control. In a study Kostka & Jachimowicz (2010) in older adults with stroke, they found that the relationship of MHLC Powerful Others and MHLC Chance to QOL was less pronounced and gave opposite results. Indeed important differences were observed in the strength of associations among the three groups; LOT-R, MHLC Powerful Others, MHLC Chance and GSES were the most important correlates of QOL in the veteran home group, while MHLC Internal was the most important in long-term care home inhabitants. Also, consistent with another study by Johnston, Morrison, Macwalter & Partridge (1999) on the perceived control following stroke showed in a longitudinal study within 3 weeks of the stroke, 1 month after discharge and 6 months after discharge. The results confirmed that perceived control predicted recovery from disability but no support was found for the mediating effects of mood (depression).

However, this is at variance with a study by Sinyor et al. (1989) which showed that individuals who had high HLC scores expressed greater hopelessness but the present study showed no significant difference in any of the health locus of control in predicting Post-stroke depression.

5.1.7 Cognitive rehabilitation

In line with the objectives of the study, it was shown that stroke survivors who are exposed to cognitive rehabilitation therapy, psycho education therapy and waiting list control differed significantly on their level of post-stroke depression controlling for stressful events was accepted. The result revealed significant variation among the levels of psychotherapy on post-stroke depression and that when stress was introduced as a co-variate there was no difference in the result showing that the stress

levels were not the factors influencing the results seen in the study. Furthermore, it was shown that there are differences in the post –stroke depression of the different treatment modalities after therapy and that the introduction of stressful life events does not change nor influence this result. This is similar to the result of Cicerone et al.(2011) in which there was comparison of cognitive rehabilitation therapy (CRT) to other forms of therapy to assess relative to comparative effectiveness and found that greater improvement was in the standard cognitive rehabilitation therapy (CRT) group for the management of symptoms at follow- up. Findings by Tiersky et al. (2005) when they tested the efficacy of a comprehensive rehabilitation therapy programme with cognitive rehabilitation sessions found that the treatment group improved significantly in depression compared to the control at 1 month and 3-month follow-ups.

In greater detail, stroke survivors who are exposed to cognitive rehabilitation therapy (CRT) had significant reduction in their post – stroke depression at post-test than at pre-test than the waiting list control (CT) survivors in the level of post-stroke depression among the cognitive rehabilitation group than the waiting control list group. These results are consistent to the findings of Sarajuuri et. al. (2005) which evaluated survivors, following a comprehensive 6 week neurorehabilitation program with psychotherapy against a waiting list of conventional care and found even at two year follow-up, the treatment group improved significantly more than control group. Consistent with this also, is the Braunling-Mcmorrow et al. (2010) study on the effect of multifaceted rehabilitation services on functional outcomes for patients; they found in the study that using the rehabilitation treatment model for neuropsychologically impaired participants had significant treatment gains of approximately 1.5 levels.

Furthermore, a study by Rattok et al. (1992) assessed three groups with varying treatments combinations of cognitive rehabilitation therapy (CRT), personal counseling/ information and small groups exercises with each group receiving 400 hours of each and it was discovered that all the three groups mix well with effectiveness but with some superior results especially in the intra and interpersonal functions of the cognitive rehabilitation therapy (CRT) group more emphasized. Finally, Macdonald et al.(2008) tested the efficacy of remediation , cognitive rehabilitation therapy (CRT) and waiting list control with the focus of their study on the mood disturbances (depression and anxiety), they observed that the skill training group (CRT) did improve differentially on their outcome measure variable however, there was no difference between the other primary or secondary outcomes in the study. It is of major concern that none of the depressed patients in this study was on any antidepressant treatment or referred for psychotherapy prior to the study itself. This is despite of the well documented literature on the increased disability, worse rehabilitation outcome and higher mortality in depressed survivors (Paolucci et.al, 1999; Gillen et.al, 2001).

5.2. Conclusion

The study also showed an equally high prevalence of post-stroke depression of 38.9% which is very high, while noting that this is a hospital based study, with a marginally higher number of female 57.8 percent. There is no relationship between the lesion location and development of post-stroke depression at least in a selected Nigerian sample. Younger aged survivors of stroke attacks are more at risk for post-stroke depression if with physical disability, than older people with physical disability. Locus of control of stroke survivors did not predict post-stroke depression

independently or jointly, although there is a moderate relationship but locus of control (Internal, chance, powerful others 'Doctor', powerful others 'other') do not predict the development of Post-stroke depression in stroke survivors.

This study has established the efficacy of cognitive rehabilitation therapy in the treatment of post-stroke depression and the impact of perceived social support on the development and progression of post-stroke depression. Cognitive rehabilitation therapy differs significantly to other psychological forms of treatment such as psycho education and the waiting list control in rehabilitation results. Also, the difference in Cognitive rehabilitation therapy and the other types of therapies (psycho education and waiting list control) was not due to the impact of stressful events.

Cognitive rehabilitation therapy is an effective method of treating post-stroke depression in stroke survivors after the comparison at the post-test after treatment. Finally, this has implication for the multidisciplinary team of neuro-rehabilitators to adhere to the concept of bio-psycho-social treatment of stroke survivors to bring out the best in them and the quality of services rendered to the patients.

5.3. Implication of findings

Depression following stroke is a real even in African societies and widespread phenomenon that must be recognized and managed by health care professionals and rehabilitators. Some form of treatment must be instituted as soon as the disorder presents itself if we are to effectively and humanely care for this at risk population. It is worth noting that none of the patients seen in the study was placed on psychological or pharmalogical treatment of post-stroke depression before the start of cognitive rehabilitation therapy despite complaints by the survivors and their caregivers (sometimes) about the mood and affect, these pleas are constantly ignored by the

formal careers (health care practitioners). It is implied that the general practitioners, neurologists, clinical psychologist and the multi disciplinary rehabilitation team should actively look-out for post-stroke depression in clients and refer appropriately, while, also looking out for the at risk patients especially those without strong social support, those who are young and with physical disability.

Ultimately, the study proved that there is a treatment modality which is available to treat post-stroke depression which must not be overlooked if we want to treat this at risk population humanely and it had been shown to be effective over a short time span of about 9 sessions. This study also claims that the females are more depressed after stroke though not of statistical significance but there is the need for the rehabilitation team to look out for women who are more at risk.

In addition, findings from this study demonstrates the effectiveness of cognitive rehabilitation therapy and psycho educational therapy than the usual care, however, the cognitive rehabilitation therapy brings about better treatment result. The implications are that non – pharmacological methods can also be used in the treatment of post-stroke depression. Many studies had proved that antidepressants are not without their risks for patients already with stroke. Patients are often not motivated for additional drugs to their already heavy drug regime, thereby requiring the physician to be cautious in administration and regulation of dosage which might not be farfetched from the reasons the patients in the study were not placed on any treatment despite obvious signs of depression. One obvious advantage of cognitive rehabilitation therapy is the absence of side effects and the ultimate advantage of learning usage of life coping skills which will help in mastering life's stress and problems.

Finally, it is of major concern that none of the depressed patients in this study was on any antidepressant treatment or referred for psychotherapy prior to the study

itself. Therefore, there is serious need for more routine screening of depression and institute appropriate treatment models.

5.4. Limitations

Studies are built with designs which are appropriate at the time and population of study, some of the features of the study limit the extent to which conclusions can be drawn , which points to directions of future research. First the result of the study should be interpreted with caution because of the moderate sample size. The result also is of the sample for which involves the respondents that are hospital based patients which are not the only facilities taking care of stroke patients in African societies such as religious centers, herbal treatment centers and alternative medical practitioners.

Again, majority of the survivors in this study are moderately well to do in their economic status and there is the possibility that the result may be different when the economically low survivors are the major respondents in the study. The exclusion of a number of patients in this study as in other studies is another limitation Sinyor et al. (1989); Burvil et.al., (1996) because of severe cognitive or communicative deficits, which may contribute to an underestimate of psychiatric morbidity. Lastly, the treatment stage of the study could have spanned over a longer period of time over years to measure length of therapeutic gains of the treatment procedures and also see if there will be spontaneous remission in the control survivors.

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Appendix A

THE INFORMED CONSENT FORM

IRB Research approval number: NHREC/05/01/2008a

This approval will elapse on: 10/10/2013

Title of the research: The efficacy of cognitive rehabilitation therapy on post stroke depression among stroke survivors in Ibadan, Ibadan, NIGERIA.

I, Olukolade, Olugbemi a clinical Psychologist of the Department of Family Medicine and Department of Psychiatry, University College Hospital, Ibadan. I am investigating the Efficacy of Cognitive Rehabilitation Therapy on post –stroke depression among survivors in Ibadan, Ibadan, Nigeria. In this way, it will provide a framework for further explanations and scientific determinants, treatment of post-stroke depression. Your responses will be kept confidential. The information you and other people give me will be used by me to recommend plans for health problems facing stroke survivors and solution to these and many more.

During this exercise you will be asked questions that preclude post-stroke depression and you will be randomly placed in a specific group of therapy at no additional cost to your treatment regime. Your honest answers to the questions will help us understand more about stroke, its treatment and the post-stroke depression and its impact on recovery. You are free to refuse to take part in this programme. You have the right to withdraw at any time if you choose to do so and will not negatively impact on your further treatment in this hospital.

We greatly appreciate your help in responding to this study.

CONSENT: Now that the study has been well explained to me and I fully understand the content of this study process. I will be willing to take part in the programme.

_____ _____

Signature/thumb print of participant/caregiver Signature of interviewer /Date

In addition, if you have any question about your participation in the research, you can contact the Investigator: OLUKOLADE, Olugbemi on the following numbers 08036701284, 08128276962.

Appendix B

QUESTIONNAIRE

SECTION A

Sex: Male ( ) Female ( )

Age: ( )

Religion: Christianity ( ), Islam ( ), Other ( ) _____

Ethnic group: Yoruba ( ), Ibo ( ), Hausa ( ), others (specify) _____

Academic Status: None ( ) Pry ( ), SSCE ( ), Undergraduate ( ), Post graduate ( )

Prior Illness: Hypertension ( ), Diabetics ( ), Heart disease ( ), others (specify) _____

Year of first episode: _____, No of strokes_____ lesion location: left ( ), right ( )

Stroke Type: Ischemic ( ), Hemorrhagic ( ), Indeterminate/mixed ( ) Hosp No ( )

Concordance: Left ( ) Right ( ) weakness now Left ( ) Right ( )

SECTION B

Instructions: Below are some statements which are meant to describe the way you have been feeling during the **PAST TWO WEEKS**, including **TODAY**. Please circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group, be sure you do not choose more than one statement for any group. There is no right or wrong answers and answer as truthfully as possible.

A. Sadness 0 I do not feel sad 1 I feel sad much of the time 2 I am sad all the time 3 I am so sad or unhappy that I cannot stand it		**D. Loss of Pleasure** 0 I get as much pleasure as I ever did from the things I enjoy 1 I don't enjoy things as much as I used to 2 i get very little pleasure from the things I used to enjoy 3 I cannot get any pleasure from the things I used to enjoy	
B Pessimism 0 I am not discouraged about my future 1 I feel more discouraged about my future than i used to be 2 I do not expect things to work out for me		**E. Guilty Feelings** 0 I don't feel particularly guilty 1 I feel guilty over many things I have done or should have done 2 I feel quite guilty most of the time 3 I feel guilty all of the time	

3 I feel my future is hopeless and will only get worse			
C. Past Failure 0 I do not feel like a failure 1 I have failed more than I should have 2 As I look back, I see a lot of failure 3 I feel I am a total failure as a person		**F. Punishment feeling** 0 I don't feel I am being punished 1 I feel I may be punished 2 I expect to be punished 3 I feel I am being punished	
G. Self Dislike 0 I feel the same about myself as ever 1 I have lost confidence in myself 2 I am disappointed in myself 3 I dislike myself		**O Loss of energy** 0 I have as much energy as ever 1 I have less energy than I used to have 2 I don't have enough energy to do very much 3 I don't have enough energy to do anything	
H. Self –criticalness 0 I don't criticize or blame myself more than usual 1 I am more critical of myself than I used to 2 i criticize myself for all my faults 3 I blame myself for everything bad that happens		**P Changes in sleeping pattern** 0 I have not experiences any change in my sleeping pattern 1a I sleep somewhat more than usual 1b I sleep somewhat less than usual 2a I sleep a lot more than usual 2b I sleep a lot less than usual 3a I sleep most of the day 3b I wake up 1-2 hours early and can't get back to sleep	
I Suicidal thoughts or wishes 0 I don't have any thoughts of killing myself 1 I have thoughts of killing myself, but I would not carry them out 2 I would like to kill myself 3 I would kill myself if I had the chance		**Q Irritability** 0 I am no more irritable than usual 1 I am more irritable than usual 2 I am much more irritable than usual 3 I am irritable all the time	
J Crying 0 I don't cry anymore than I used to 1 I cry more than I used to		**R Changes in Appetite** 0 I have not experienced any change in my appetite	

2 I cry over every little thing 3 I feel like crying but I can't		1a my appetite is somewhat less than usual 1b my appetite is somewhat greater than usual 2a My appetite is much less than before 2b My appetite is much greater than usual 3a I have no appetite at all 3b I crave food all the time	
K Agitation 0 I am no more restless or wound up than usual 1 I feel more restless or wound up than usual 2 I am so restless or agitated that it's hard to stay still 3 I am so restless or agitated that I have to keep moving or doing something		**S Concentration Difficulty** 0 I can concentrate as well as ever 1 I can't concentrate as well as usual 2 it's hard to keep my mind on anything for very long 3 I find I can't concentrate on anything	
L Loss of Interest 0 I have not lost interest in other people or activities 1 I am less interested in other people or things than before 2 I have lost most of my interest in other people or things 3 it's hard to get interested in anything		**T Tiredness or Fatigue** 0 I am no more tired or fatigued than usual 1 I get more tired or fatigued more easily than usual 2 I am too tired or fatigued to do a lot of things I used to do 3 i am too tired or fatigued to do most of the things I used to do	
M Indecisiveness 0 I make decisions about as well as ever 1 I find it more difficult to make decisions than usual 2 I have much greater difficulty in making decisions than I used to 3 I have trouble making any decisions		**U Loss of interest in sex** 0 I have not noticed any recent change in my interest in sex 1 I am less interested in sex than I used to be 2 I am much less interested in sex now 3 I have lost interest in sex completely	
N Worthlessness			

0 I do not feel I am worthless 1 I don't consider myself as worthwhile and useful as I used to 2 I feel more worthless as compared to other people 3 I feel utterly worthless			

SECTION C

INSTRUCTIONS: The items listed below refer to people ability do activities of daily living. Please read each item carefully and decide to what extent it is characteristic of you.

Patient Name: _____ Rater: _____ Date: / / :	
Activity	**Score**
Feeding 0 = unable 5 = needs help cutting, spreading butter, etc., or requires modified diet 10 = independent	0 5 10
Bathing 0 = dependent 5 = independent (or in shower)	0 5
Grooming 0 = needs to help with personal care 5 = independent face/hair/teeth/shaving (implements provided)	0 5
Dressing 0 = dependent 5 = needs help but can do about half unaided 10 = independent (including buttons, zips, laces, etc.)	0 5 10
Bowels	0 5 10

0 = incontinent (or needs to be given enemas) 5 = occasional accident 10 = continent	
Bladder 0 = incontinent, or catheterized and unable to manage alone 5 = occasional accident 10 = continent	0 5 10
Toilet Use 0 = dependent 5 = needs some help, but can do something alone 10 = independent (on and off, dressing, wiping)	0 5 10
Transfers (bed to chair and back) 0 = unable, no sitting balance 5 = major help (one or two people, physical), can sit 10 = minor help (verbal or physical) 15 = independent	0 5 10 15
Mobility (on level surfaces) 0 = immobile or < 50 yards 5 = wheelchair independent, including corners, > 50 yards 10 = walks with help of one person (verbal or physical) > 50 yards 15 = independent (but may use any aid; for example, stick) > 50 yards	0 5 10 15
Stairs 0 = unable 5 = needs help (verbal, physical, carrying aid) 10 = independent	0 5 10
TOTAL (0 - 100)	_____

Section D

Instruction: The following questions are to understand how you had been feeling with your emotion over the past 2 weeks since the stroke illness

	Yes definitely	**Yes sometimes**	**No, not much**	**No, not at all**
1. I wake early and then sleep badly for the rest of the night.	**3**	**2**	**1**	**0**
2. I get very frightened or have panic feelings for apparently no reason at all.	**3**	**2**	**1**	**0**
3. I feel miserable and sad.	**3**	**2**	**1**	**0**
4. I feel anxious when I go out of the house on my own.	**3**	**2**	**1**	**0**
5. I have lost interest in things.	**3**	**2**	**1**	**0**
6. I get palpitations, or sensations of 'butterflies' in my stomach or chest.	**3**	**2**	**1**	**0**
7. I have a good appetite.	**0**	**1**	**2**	**3**
8. I feel scared or frightened.	**3**	**2**	**1**	**0**
9. I feel life is not worth living.	**3**	**2**	**1**	**0**
10. I still enjoy the things I used to.	**0**	**1**	**2**	**3**
11. I am restless and can't keep still.	**3**	**2**	**1**	**0**
12. I am more irritable than usual.	**3**	**2**	**1**	**0**
13. I feel as if I have slowed down.	**3**	**2**	**1**	**0**
14. Worrying thoughts constantly go through my mind.	**3**	**2**	**1**	**0**

SECTION E

Instruction: The following questions will quickly ask about the types of people available for helping you physically and emotionally since this stroke illness. The answers could be VSD- very strongly disagree, SD- Strongly disagree, MD- Moderately disagree, N- Neutral, MA – Moderately Agree, SA- Strongly Agree and VSA- Very Strongly Agree

		VSD	SD	MD	N	MA	SA	VSA
1	There is a special person who is around when I am in need.							
2	There is a special person with whom I can share my joys and sorrows.							
3	My family really tries to help me.							
4	I get the emotional help and support I need from my family.							
5	I have a special person who is a real source of comfort to me.							
6	My friends really try to help me.							
7	I can count on my friends when things go wrong.							
8	I can talk about my problems with my family.							
9	I have friends with whom I can share my joys and sorrows.							
10	There is a special person in my life who cares about my feelings.							
11	My family is willing to help me make decisions.							
12	I can talk about my problems with my friends.							

Section F

Instruction: Each item below is a belief statement about your stroke illness with which you may agree or disagree. This is a measure of your personal beliefs; obviously, there are no right or wrong answers. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6).

1=STRONGLY DISAGREE **(SD)** 2=MODERATELY DISAGREE **(MD)** 3=SLIGHTLY DISAGREE **(D)**	4=SLIGHTLY AGREE **(A)** 5=MODERATELY AGREE **(MA)** 6=STRONGLY AGREE **(SA)**

1=STRONGLY DISAGREE **(SD)** 2=MODERATELY DISAGREE **(MD)** 3=SLIGHTLY DISAGREE **(D)**	4=SLIGHTLY AGREE **(A)** 5=MODERATELY AGREE **(MA)** 6=STRONGLY AGREE **(SA)**

		SD	MD	D	A	MA	SA
1	If my condition worsens, it is my own behavior which determines how soon I will feel better again.	1	2	3	4	5	6
2	As to my condition, what will be will be.	1	2	3	4	5	6
3	If I see my doctor regularly, I am less likely to have problems with my condition.	1	2	3	4	5	6
4	Most things that affect my condition happen to me by chance.	1	2	3	4	5	6
5	Whenever my condition worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am directly responsible for my condition getting better or worse.	1	2	3	4	5	6
7	Other people play a big role in whether my condition improves, stays the same, or gets worse.	1	2	3	4	5	6
8	Whatever goes wrong with my condition is my own fault.	1	2	3	4	5	6
9	Luck plays a big part in determining how my condition improves.	1	2	3	4	5	6
10	In order for my condition to improve, it is up to other	1	2	3	4	5	6

	people to see that the right things happen.						
11	Whatever improvement occurs with my condition is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my condition is what I myself do.	1	2	3	4	5	6
13	I deserve the credit when my condition improves and the blame when it gets worse.	1	2	3	4	5	6
14	Following doctor's orders to the letter is the best way to keep my condition from getting any worse.	1	2	3	4	5	6
15	If my condition worsens, it's a matter of fate.	1	2	3	4	5	6
16	If I am lucky, my condition will get better.	1	2	3	4	5	6
17	If my condition takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18	The type of help I receive from other people determines how soon my condition improves.	1	2	3	4	5	6

SECTION G

Instruction: Some multiple questions will be asked from you about events that have occurred in your life since the stroke illness.

Event Stress	**Scores**
__ Death of Spouse	100
__ Divorce	73
__ Marital Separation	65
__ Jail Term	63
__ Death of close family member	63
__ Personal injury or illness	53
__ Marriage	50
__ Fired from work	47
__ Marital reconciliation	45
__ Retirement	45

__ Change in family member's health	44
__ Pregnancy	40
__ Sex difficulties	39
__ Addition to family	39
__ Business readjustment	39
__ Change in financial status	38
__ Death of close friend	37
__ Change to a different line of work	36
__ Change in number of marital arguments	35
__ Mortgage or loan over $10,000	31
__ Foreclosure of mortgage or loan	30
__ Change in work responsibilities	29
__ Trouble with inlaws	29
__ Outstanding personal achievement	28
__ Spouse begins or stops work	26
__ Starting or finishing school	26
__ Change in living conditions	25
__ Revision of personal habits	24
__ Trouble with boss	23
__ Change in work hours, conditions	20
__ Change in residence	20
__ Change in schools	20
__ Change in recreational habits	19
__ Change in church activities	19
__ Change in social activities	18
__ Mortgage or loan under $10,000	17
__ Change in sleeping habits	16
__ Change in number of family gatherings	15
__ Change in eating habits	15
__ Vacation	13
__ Christmas season	12
__ Minor violation of the law	11

CALCULATE Total score: _____

SECTION H

The following questions are to understand how you had been feeling since the stroke illness and understand how to help you overcome them. Please tick Yes or No where appropriate and write in the space provided if needed.

		YES	NO
1	Do you have any prior medical illness before this stroke? If yes_____ _____ If no do have symptoms which you were uncomfortable with then? Yes ( ) No( ), if yes list them _____ _____		
2	Is there a diagnosis of the medical illness prior to the stroke? List_____		
3	Is this the first ever stroke? If no, what number? _____		
4	Is there a family history of a chronic illness? If yes, who? _____		
5	Apart from the drugs prescribed by your doctor did you take any other drug for this illness? Why? _____ _____		
6	Do you feel you are educated satisfactorily about your stroke?		
7	Do you still want to know more? Please list what you'll like to know_____ _____		
8	Did you follow all your doctor's instructions before this stroke episode? How do you feel now about this? _____ _____		
9	Did you use herbal or any unorthodox medicines before the stroke?		
10	Do you still wonder why you had stroke?		
11	Do you believe your stroke is spiritually caused? Why? _____		
12	Do you feel unhappy most of the time since this illness?		
13	Do you feel guilty? Why? _____ _____		
14	Do you blame yourself for this stroke? If yes Why? _____ If No Why?		

	_____		
15	Do you feel there is someone to care for you, during and after this stroke? Who?_____ relationship_____		
16	What is your fear about this illness? List_____		
17	Are there specific constraints you've had because of this stroke? List_____		
18	Do you believe there is a spiritual power behind this stroke? How? _____ _____		
19	Are there things that have changed in your life? List them_____ _____		
20	Are you confident you about going back to your previous way of living? Why? _____		
21	Do you feel like talking about your illness but find no one to listen?		
22	Do you have a pleasant way of enjoying yourself? How?		

SECTION I

1	Best Motor power in the dominant hand/upper limb	0 Nil	1 Flicker	2- Active motion when gravity eliminated	3- Active motion against gravity	4- Active motion against moderate resistance	5- Normal
2	Best motor power in the weaker limb						
3	Speech Disorder (Aphasia)	0 Nil	1 Present				
4	Mobility		1- Bed-bound	2 Chair Bound	3 Walks with helper	4 Walks independently with aids (e.g. frames /tripod)	Walks unaided

Thank you for cooperation

APPENDIX B

IN-DEPTH INTERVIEW GUIDE

After general introduction of researcher, job, purpose of the interview and advantage to the respondent and general body of knowledge.

1) What type of medical illness did you have before this stroke episode?

2) Is this the first time you have this stroke attack?

* How many times and how do you feel about it (if not first time).

3) Is there a family history of chronic illness such as Hypertension, diabetics in your family?

4) Where was the diagnosis done?

* probe (private, government or herbal)

5) Where you given thorough education on treatment and drug treatment?

6) Where you compliant with the instructions, you were given then?

* If not (why and reasons)

7) Do you now have guilt feelings, crying spells and blaming thoughts and words?

8) What are your feelings now that you have this stroke?

9) Were you given enough education; did you feel you can overcome the effects?

* Probe (Why)

10) What are your major thoughts and worries?

11) What are the health related issues you have in regard to this illness (disability, cognitive, spiritual).

12) How confident are you about going back home with this illness?

13) What are your challenges?

14) Do you have someone who you can share your deep desires with?

APPENDIX C Ethical approval

APPENDIX D:

(CRT MANUAL) GROUND RULES FOR THERAPY

COME ON TIME

*do not keep others/therapist waiting.

COME EVERY WEEK

*make a commitment to the treatment.

*call the clinic (***-****) if you can't make it. / though we'll call you every week

BE POSITIVE

BE CONSTRUCTIVE (IF IN GROUP)

* avoid criticism, give constructive feedback.

* help each other find the good side of things.

* be caring, thoughtful.

* don't put pressure on each other (no "shoulds").

EQUAL TIME FOR ALL (IF IN GROUP)

* give everyone a chance to talk.

* one person at a time talks, no side conversations.

KEEP IT PRACTICAL

*focus on solutions, not on how bad things are.

DO THE HOMEWORK!!

*practice what you learn.

*these methods can help you control your depression, only if you practice.

CONFIDENTIALITY

* Nothing you say or known about you will be divulged to anyone.

* We do not discuss **personal** things with people outside of the group.

* You can discuss what you are learning about depression with others.

TELL US IF YOU ARE UNHAPPY!!

*bring concerns up in the sessions.

*we want to work with you.

*don't stay mad at the therapy without letting us know.

HOW WE THINK ABOUT DEPRESSION

The kind of therapy we provide in this group is called

"COGNITIVE-REHABILITATIONAL THERAPY"

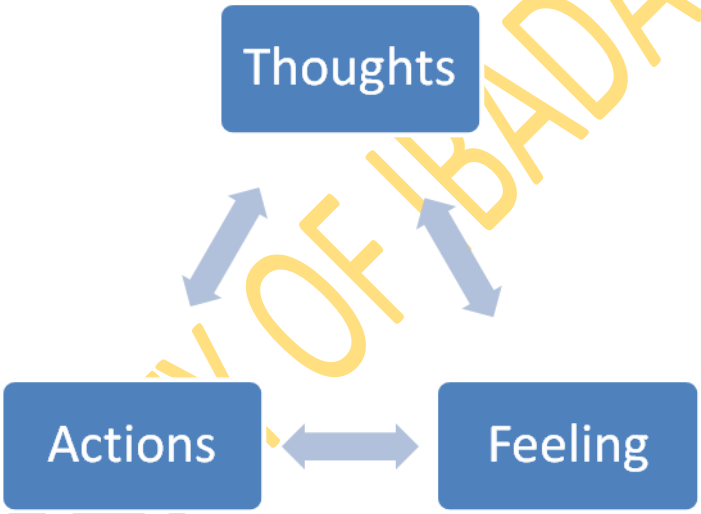
"Cognitive" refers to our thoughts.

"Rehabilitation" refers to our actions that help in dealing with stroke.

Depression has most to do with our feelings.

_

By learning how thoughts and actions influence our feelings,
we can learn to get more control over our feelings of depression.



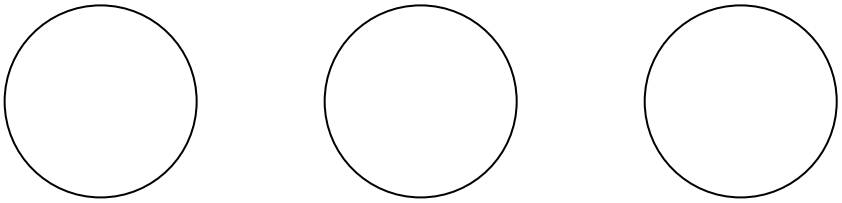
For example, next week you may wake up feeling very depressed and physically ill and you could tell yourself one of two different things:

--- *"I feel too awful/sick to go to my therapy." > miss therapy*

--- *"Yes, I don't feel like going but it will probably make me feel better than if I stay at home."*

We will be working on breaking the following three cycles:

Depression Depression Depression



Low activities Negative thoughts Few and Negative people Contacts

The therapy sessions will provide plenty of support, sharing and skills for 9 weeks but that what is equally and maybe important are the techniques that will allow you to continue coping after 9 weeks.

Our treatment for depression consists of nine sessions.

We focus on what is going on in one's life right now.

The therapy is focused on how to control depression in practical ways that can be used now and in the future.

The sessions are divided into three parts which intertwines.

1- How thoughts affect your mood.

2- How your activities affect your mood.

3- How contacts with/and other people affect your mood.

HOW THOUGHTS AFFECT YOUR MOOD - Session 1

I. The purpose of the therapy group is to treat depression by teaching ways to control our mood better

A. Four Goals:

1. To make the feelings of depression less intense.
2. To make the time we are depressed shorter.
3. To learn ways to prevent getting depressed again.
4. To feel more in control of our lives.

II. The purpose of today's meeting:

A. To explain each therapy meetings.

B. To introduce ourselves to each other.

C. To learn what depression is.

D. To learn a helpful way to think about depression.

E. To learn how thoughts influence how we feel.

III. GROUND RULES (page 1)

IV. Introductions

A. Say a little about yourself

(not about your problems -- we'll get to them a little later).

1. Example:

a. where you grew up.

b. your family.

c. what kind of work you have done.

d. your main interests.

e. things about yourself that you think are important.

V. What is depression?

A. The word "depression" is used in many ways.

1. It can mean:

a. a feeling that lasts a few minutes.

b. a mood that lasts a few hours.

c. a clinical condition that.

i. lasts at least two weeks and,

ii. causes strong emotional pain and,

iii. makes it hard for us to carry out our daily duties.

B. This Rehabilitation therapy is intended to treat Mild- **clinical depression**.

VI. The symptoms of clinical depression are:

A. Feeling depressed or down nearly every day.

B. Not being interested in or unable to enjoy things you used to enjoy.

C. Appetite and/or weight change.

(eating either more or less than is usual for you)

D. Big changes in how much you sleep. (sleeping either more or less than is usual for you)

E. Changes in how fast you move.

(either being fidgety and restless or slowed down)

F. Feeling tired all the time.

G. Feeling worthless or guilty.

H. Trouble thinking, concentrating or making decisions.

I. Thinking a lot about death, wishing to be dead, or thinking about hurting yourself (suicide).

VII. Stroke and depression. ASP (leaflet)

VIII. See sheet on "HOW WE THINK ABOUT DEPRESSION" (page 5)

A. What problems would you like to work on?

B. What are your goals for therapy?

IX. What is depression like for you?

(Here you can share your problems.)

A. What kinds of thoughts go through your mind when you feel depressed?

B. What do you do when you are depressed?

C. How do you get along with people when you are depressed?

D. What do you think is the cause of your depression?

X. THOUGHTS AFFECT MOOD: Certain kinds of thoughts make it more or less likely that you will become depressed.

A. By "thoughts" we mean "things we tell ourselves".

1. Thoughts can have an effect on your body.

2. Thoughts can have an effect on your actions.

3. Thoughts can have an effect on your mood.

XI Rationale for therapy

A. Psychology is a science therefore procedures are valid and reliable

B. CRT is a body of science that had proven and it works

X. A good way to think about this type of therapy is that you will learn specific methods to change your thoughts and actions, so that your mood will improve. *The sessions will provide plenty of support and sharing for 9 weeks but that what is equally and maybe more important are the techniques that will allow you to continue coping after the 9 weeks.*

HOMEWORK:

1. The Daily Mood Scale

a. See instructions for using the Daily Mood Scale.

INSTRUCTIONS FOR USING THE DAILY MOOD SCALE

To begin to see how your own mood changes you will keep track of your daily mood, using the DAILY MOOD SCALE.

To make this a valuable exercise the DAILY MOOD SCALE should be filled out **every day**.

Directions:

Just before you go to bed, take out your mood scale.

Think over the day and decide what your mood was like today.

Circle the number which stands for how you felt today.

"9" means the best mood you can imagine

(This number would be used only on the "happiest days of your life" so it is not likely to be used often.)

"5" means an average mood

(This is the kind of normal mood most people have most of the time. It is the kind of mood you have most days when you are not depressed.)

"1" means the worst mood you can imagine

(This number would be used only on the "worst days of your life" , so it is not likely to be used often.)

INSTRUCTIONS FOR FUTURE "THOUGHTS" SESSIONS:

At the bottom of the scale, there is a place for you to jot down the number of thoughts you have each day, in addition to your mood. By doing this, you will be able to see what kind of effect the things we are trying each week is having on your depression.

DAILY MOOD SCALE

Week Number _____

Name _____ Week Starting: _____

Day	____	____	____	____	____	____	____
DAILY MOOD SCORE							
BEST	9	9	9	9	9	9	9
	8	8	8	8	8	8	8
	7	7	7	7	7	7	7
	6	6	6	6	6	6	6
	5	5	5	5	5	5	5
AVERAGE	4	4	4	4	4	4	4
	3	3	3	3	3	3	3
	2	2	2	2	2	2	2
WORST	1	1	1	1	1	1	1
Number of thoughts							
Positive:	____	____	____	____	____	____	____
Negative:	____	____	___	____	____	____	____

ASSESS PROBLEMS AND IMPROVE PROBLEM SOLVING SKILLS AND BUILD PLEASANT EVENTS - Session 2

REVIEW: 1. What is depression?

2. Homework: Daily Mood Scale, How was filling it out each day? Any surprises?

3. Why is the homework important?

I. Problems in stroke are real.

A. Specific problems are conceived in our mind and our problems affect our mood

1. Is it possible not to think about problems? No.

The differences in depression and normal thinking

Depression	Normal thinking
Depressed thinking focus on the problem	Right thinking focus on ways out/positives out of the problem
Depression can linger for weeks, months or even years.	Sadness is a transient feeling that passes as a person comes to term with his troubles
Sadness is a part of being human -- a natural reaction to painful circumstances.	Depression, however, is a physical illness with many more symptoms than an unhappy mood.
The person with clinical depression finds that there is not always a logical reason for his dark feelings.	Normal sadness lifts with exhortation and support from family and friends
A person with clinical depression may feel overwhelmed and hopeless.	The sad person feels bad, but continues to cope with living.

2. Assessing the problem makes it less probable that it will lead to depressed thinking

I. Problem solving as a skill in overcoming depression

a) The problems you face can be large or small, simple or complex, and easy or difficult to solve. Regardless of the nature of the problems, a fundamental part of

every person with stroke is finding ways to solve the problems. So, being a confident problem solver is really important to your success in overcoming depression.

b) Much of that confidence comes from having a good process to use when approaching a problem. With one, you can solve problems quickly and effectively. Without one, your solutions may be ineffective, or you'll get stuck and do nothing, with sometimes painful consequences.

II) Understanding steps in problem solving

There are four basic steps in problem solving:

1. Defining the problem.
2. Generating alternatives.
3. Evaluating and selecting alternatives.
4. Implementing solutions.

III) Discussion:

Enumerate the problems caused by this stroke, before this stroke and lets brain-storm on solving them. (ONLY THOSE THAT CONSTITITUTE PROBLEMS)

IV) Pleasant events are difficult when there is an illness such as stroke

-Pleasant event are pleasurable activities which individuals schedule to make life and living pleasurable which are the opposite of depression

-Pleasurable events are possible with stroke only if deliberately scheduled. If pleasurable events are scheduled irrespective of how small mood changes.

-In every depressive cycle there is a lack of pleasurable events which is enjoyed in the past or developed now.

V). Identify activities that the person with stroke might enjoy, based on what they enjoyed in the past.

Assignment: Pleasant event scheduling and planning ahead for a week.

Weekly mood diary

PLEASANT EVENT SCHEDULING AND PLANNING SHEET

DAY	EVENT SCHEDULED	MOOD RATING am pm	Mood after Event	NOTES
Example **SUN**	Example Going to zoological garden U.I.	Example Nothing great am 30 Things gradually pm 50 getting better	Example 70	Example Felt great after a long time and being loved.
		am pm		
		am pm		
		am pm		
		am pm		
		am pm		
		Am Pm		

DISTORTED THINKING AND IMPAIRED SOCIAL INTERACTION – session 3

REVIEW: 1. Homework - The Daily Mood Scale.

a. What kinds of thoughts did you have last week?

2. The purpose of the course.

I. Ways to increase healthy thinking:

A. INCREASING THOUGHTS THAT PRODUCE A BETTER MOOD.

1. Increasing the number of good thoughts in your mind.

a. Make lists of good thoughts about yourself and about life.

2. Give yourself pats-on-the-back.

Most of the things we do are not noticed by others.

Therefore, it is important for us to notice them and give ourselves credit for doing them.

a. "I made it to group today, even though it was raining

3. "Hold Everything!"

Give ourselves a break by taking time out mentally.

a. Pause. Let your mind relax, let your mind take a break.

Allow your body to feel at peace. Feeling at peace can give you energy.

4. Time Projection.

Imagine yourself taking the steps to move toward a time when things will be better.

5. Survivor contribute to lists:

(+) things about me *(-) things about life*

*1.*_____ *1.*_____

*2.*_____ *2.*_____

*3.*_____ *3.*_____

*4.*_____ *4.*_____

*5.*_____ *5.*_____

etc. *etc.*

Read the list and see how you feel after reading the lists.

B. DECREASING THOUGHTS THAT MAKE US FEEL BAD.

1. Thought stopping.

When a thought is ruining our mood:

a. Identify it.

b. Tell yourself: "This thought is ruining my mood."

c. Think of another thought.

2. Worrying time.

Schedule "worry time" each day so you can concentrate completely on necessary thinking and leave the rest of the day free of worry.

Worry time can be ten to thirty minutes long.

3. Make fun of problems by exaggerating them.

a. Have a good sense of humor.

b. Try making fun of your own worries.

i. Sometimes that can take the sting out of them.

c. Examples:

i. Man with anger problem imagines smoke coming out of ears and fire fuming from his nostrils and the fire department having to break down door and hose him down.

ii. Woman with enuresis imagines comparing notes on pampers with her 3 year old granddaughter.

4. Consider the worst that could happen.

Often, vague fears about what could happen make us more depressed than thinking things through and facing the worst possibilities.

a. Remember that the worst that can happen is only one of many possibilities.

b. Just because it is the worst, it is not the one most likely to happen.

5. Be your own coach.

a. Think about how you want the situation to turn out.

b. Is the outcome realistic?

c. Think about what steps are necessary to reach your goal.

d. Recognize that by doing this, you are trying to control your depression.

C. TALKING BACK TO YOUR THOUGHTS: THE A-B-C-D METHOD

1. When you feel depressed, ask yourself what you are thinking.

Then try to talk back to the thought that is hurting you.

A is the **A**ctivating event (what happened)

B is the **B**elief or the thought you are having

(that is, what you tell yourself about what happened)

C is the **C**onsequence

(that is, the feeling you have because of the thought)

D is the way you **D**ispute or talk back to the thought

2. Example:

You feel depressed.

You think about it and think it is because you have stroke.

Here is how you might use the ABCD Method:

A: I have stroke. (This is a fact.)

B: Thoughts I have about this fact are:

"No one can be happy if one has stroke."

"Stroke will ruin my life."

"I cannot stand having stroke."

C: The consequence of thinking these thoughts is feeling very depressed for a long time.

D: I can talk back to these thoughts in this way:

"There are people who have stroke who are as happy as people who don't have stroke."Stroke is a burden I have to deal with, but it does not necessarily ruin every minute of my life." "Having stroke is unfortunate, but many human beings have stroke. Human beings can lead satisfying lives even though they have stroke. I am a human being, therefore I can lead a satisfying life even though I have stroke."

HOMEWORK:

1. Continue the Daily Mood Scale.
2. Continue to fill out the check list of thoughts each day.
3. Practice the ABCD Method to talk back to your thoughts.
4. Weekly mood diary

Assessment*

UNDERSTANDING DYSFUNCTIONAL COPING ADHERENCE AND REASSURANCE - **WORKING WITH DAILY ACTIVITIES - Session 4**

REVIEW: 1. What is depression?

2. Homework: Daily Mood Scale, How was filling it out each day? Any surprises?

3. Why is the homework important?

I. Thoughts affect mood:

A. Specific types of thinking make a difference in your mood.

1. Some thoughts make it more likely that you will become depressed.

2. Other thoughts make it less likely that your will become depressed.

II. What are thoughts?

A. Thoughts are ideas that we tell ourselves.

1. We talk in our own heads all of the time, but we are not always aware of it.

2. It is helpful to think of thoughts as *things* that have a real effect on our bodies and our minds.

III. What is depressed thinking like?

A. NOT FLEXIBLE:

For example, a depressed person might think: *"I'll never get better."*

Flexible thoughts that keep us from being depressed might be,

"If I go to therapy, I am at least trying to feel better."

B. JUDGMENTAL:

A depressed person might think: *"I'm a failure."*

The flexible thinker may say, *"Yes, I've failed at some things but that doesn't mean I'm a failure."*

IV. What is **NON-DEPRESSED** thinking like?

A. CHANGEABLE:

Depressed: "I always have been and always will be a coward."

Flexible: "I am afraid in **SOME** situations **SOMETIMES**.

B. LOOKS AT WHAT WE DO, NOT WHO WE ARE:

The depressed thinker may say, "I was born to feel bad."

The flexible thinker may say, "I am doing things that have me down right now."

C. HOPE FOR CHANGE:

The depressed thinker says, "Nothing has ever helped me."

The flexible thinker says, "Nothing I have tried yet has helped, but this is new and the time might be right for me to start feeling better.

V. Learning to spot types of thinking.

A. Constructive versus Destructive thinking:

1. Constructive thinking helps us build ourselves up and "put ourselves together."

a. For example, the thought, "I can learn to control my life to get more of what I want" is constructive.

2. Destructive thinking "tears us apart."

a. For example, you could think "I am no good at all" or "I did everything wrong raising my kids " or "I've made so many mistakes."

B. Necessary thinking versus unnecessary thinking:

1. Necessary thinking reminds us of the things we have to do.

a. For example: "I must remember to fill out the Daily Mood Scale before I go to sleep tonight.

2. Unnecessary thinking doesn't change things, yet makes us feel bad.

a. For example: " There is going to be an earthquake soon." or

"This country is going to be ruined."

C. Positive versus Negative thinking:

1. Positive thinking makes us feel better.

a. For example, "Things are rough right now, but at least I'm here doing something to help myself."

2. Negative thinking make us feel worse.

b. For example, "It's just no use."

VI. MISTAKES IN THINKING: LEARNING TO RECOGNIZE THEM

A. All-or-Nothing Thinking:

1. You see things as completely good or completely bad.

a. For example, if you make any mistake doing something, you think your whole work was useless.

b. Instead, you may think, "I didn't do the Daily Mood Scale right, I'll try harder next time."

c. Dieting is a excellent way to illustrate: That is, many of us diet because of wt. or health reasons and become overly upset when we break our diet: "I've ruined

my diet so ti doesn't matter what I eat now." > poor eating vs. "Yes, I went off my diet but most of the time I follow it." > health eating

B. Seeing one bad event as meaning everything will be bad:

1. You see a single negative event as a never-ending defeat.

a. For example, "I did not do well in school, so I won't do well in this therapy class."

C. Mental Filter:

1. You pick out a single negative detail and dwell on it exclusively, so that you see everything as negative.

a. For example, only paying attention to the fact that you have diabetes and not noticing the sunny day or nice things people have said to you.

D. Not Counting the Positive:

1. You don't count the positive.

a. For example, you believe that everyone dislikes you, so you think there is something wrong with a person who is nice to you.

E. Jumping to Conclusions:

1. You see a negative part to what may happen anytime.

a. **Mind Reading**

i. When you see someone who is not being positive, you assume they don't like you or are mad at you. They may just be having troubles themselves.

b. **Fortune Telling**

i. You believe things will turn out badly for you. You believe that a disaster or bad things are "just bound to happen."

F. Making More or Less of Things:

1. You make your mistakes seem more than they really are, while you make good things about you less important than they are.

a. For example, you say "I made this bad mistake with my friend and she will never forgive me. I have always been nice to her, but everyone is always nice to her so that won't mean anything to her."

G. Taking Your Feelings Too Seriously:

1. Thinking that your feelings **ARE** reality.

a. For example, you think that "I feel so awful, that just proves what a terrible place this world is to live in."

H. Shoulds:

1. You try to motivate yourself with shoulds.

a. For example, you think "I should be a better person" or "I should quit eating until I loose weight."

i. When you say these "shoulds" to yourself you feel guilty.

ii. When you say them about other people, you feel angry and let down by them.

2. Shoulds are critical, moral imperative that we put on ourselves/others.

a. Like finger pointing > (-) moods.

I. Labeling Yourself:

1. Because you make a mistake, you start thinking that you are a "loser." Because you are feeling down, you think of yourself as a "depressing" person.

J. Self-Blame:

1. You blame yourself for things that you may not have been able to control.

a. For example, something bad happens to one of your children or friends and you believe it was your fault.

b. The way this typically manifests itself is with you saying "If only I had done such and such, then I wouldn't be in this situation" or "Because I was so (weak, stupid, etc.) these bad things happened to me.

i. Usually these are things out of your control

ii. Or when within control > (-) rumination vs. "Yes I made a mistake but..."

NOTE: These MISTAKES IN THINKING are adapted from the book Feeling Good: The New Mood Therapy by David Burns (Published by William Morrow and Company, 1980).

HOMEWORK:

1. Continue the Daily Mood Scale.

2. Keep track of thoughts. At the end of each day, take out the list of thoughts and place a *4* next to each thought you had today. Add up the total number of positive thoughts and the total number of negative thoughts. Note the connection between the number of each type of thought and your mood.

3. Weekly mood diary

Session Five: CARE GIVERS BURDEN, DAILY LIVING AND SELF CARE

REVIEW: 1. The purpose of this module.

2. Homework: i. How was it, keeping track of your activities?

ii. How many did you do each day?

3. Thoughts affect your mood. 4. Actions affect your mood.5. Being with people affects your mood

I. Care givers are people who take care. A caregiver is anyone who provides help to another person in need. Usually, the person receiving care has a condition such as dementia, cancer, or brain injury and needs help with basic daily tasks. Caregivers help with many things such as:

Grocery shopping , House cleaning, Cooking, Shopping, Paying bills, Giving medicine, Bathing, Using the toilet, Dressing, Eating

II. What is caregiver stress?

Caregiver stress is the emotional and physical strain of care giving. It can take many forms. For instance, you may feel:

Frustrated and angry taking care of someone with dementia who often wanders away or becomes easily upset

Guilty because you think that you should be able to provide better care, despite all the other things that you have to do

Lonely because all the time you spend caregiving has hurt your social life

Exhausted when you go to bed at night

Caregiver stress appears to affect women more than men. About 75 percent of caregivers who report feeling very strained emotionally, physically, or financially are women.

Although caregiving can be challenging, it is important to note that it can also have its rewards. It can give you a feeling of giving back to a loved one. It can also make you feel needed and can lead to a stronger relationship with the person receiving care.

About half of caregivers report that:

They appreciate life more as a result of their caregiving experience

Caregiving has made them feel good about themselves

III. Can caregiver stress affect my health?

Although most caregivers are in good health, it is not uncommon for caregivers to have serious health problems. Research shows that caregivers:

Are more likely to be have symptoms of depression or anxiety

Are more likely to have a long-term medical problem, such as heart disease, cancer, diabetes, or arthritis

Have higher levels of stress hormones

Spend more days sick with an infectious disease

Have a weaker immune response to the influenza, or flu, vaccine

Have slower wound healing

Have higher levels of obesity

May be at higher risk for mental decline, including problems with memory and paying attention

One research study found that elderly people who felt stressed while taking care of their disabled spouses were 63 percent more likely to die within four years than caregivers who were not feeling stressed.

IV. How can I tell if caregiving is putting too much stress on me?

Caregiving may be putting too much stress on you if you have any of the following symptoms:

Feeling overwhelmed

Sleeping too much or too little

Gaining or losing a lot of weight

Feeling tired most of the time

Loss of interest in activities you used to enjoy

Becoming easily irritated or angered

Feeling constantly worried

Often feeling sad

Frequent headaches, bodily pain, or other physical problems

Abuse of alcohol or drugs, including prescription drugs

Talk to a counselor, psychologist, or other mental health professional right away if your stress leads you to physically or emotionally harm the person you are caring for.

IV. tips for reducing stress:

Find out about caregiving resources in your community (see below).

Ask for and accept help. Be prepared with a mental list of ways that others can help you, and let the helper choose what she would like to do. For instance, one person might be happy to take the person you care for on a walk a couple times a week. Someone else might be glad to pick up some groceries for you.

If you need financial help taking care of a relative, don't be afraid to ask family members to contribute their fair share.

Say "no" to requests that are draining, such as hosting holiday meals.

Don't feel guilty that you are not a "perfect" caregiver. Just as there is no "perfect parent," there is no such thing as a "perfect caregiver." You're doing the best you can.

Identify what you can and cannot change. You may not be able to change someone else's behavior, but you can change the way that you react to it.

Set realistic goals. Break large tasks into smaller steps that you can do one at a time.

Prioritize, make lists, and establish a daily routine.

Stay in touch with family and friends.

Join a support group for caregivers in your situation, such as caring for someone with dementia. Besides being a great way to make new friends, you can also pick up some caregiving tips from others who are facing the same problems you are.

Make time each week to do something that you want to do, such as go to a movie.

Try to find time to be physically active on most days of the week, eat a healthy diet, and get enough sleep.

See your doctor for a checkup. Tell her that you are a caregiver and tell her about any symptoms of depression or sickness you may be having.

Try to keep your sense of humor.

VI. What can I do as the stroke patient?

Say thank you

Refuse to stay idle

Reduce complaints and nagging

Keep a good sense of humor

Assignment: 1) look for at least ways of appreciating the present or past efforts of your caregivers at least twice a day

2) Weekly mood diary

Session 6: BUILDING SELF WORTH AND CONFIDENCE THROUGH PROBLEM SOLVING with self esteem boosting.

REVIEW: 1. What is care givers stress?

2. Homework: Daily Mood Scale, How was appreciating your network(s) of caregivers been each day? Any surprises?

3. Why is the homework important?

4. The purpose of the course.

A) Problems as discussed in session 2 are real in stroke and not mere thoughts.

i) Problem solving as a skill in overcoming depression

a) The problems you face can be large or small, simple or complex, and easy or difficult to solve. Regardless of the nature of the problems, a fundamental part of every person with stroke is finding ways to solve the problems. So, being a confident problem solver is really important to your success in overcoming depression.

b) Much of that confidence comes from having a good process to use when approaching a problem. With one, you can solve problems quickly and effectively. Without one, your solutions may be ineffective, or you'll get stuck and do nothing, with sometimes painful consequences.

B) Problems we have or imagine determine how much we feel capable in our lives especially our SELF WORTH

i) Self-worth is what enables us to believe that we are capable of doing our best with our talents, of contributing well in society, and that we deserve to lead a fulfilling life. Building it up again especially after a illness like stroke is therefore natural, essential, and healthy.

ii) Steps in increasing self worth

Understand the power of your attitude toward yourself and views about yourself. How you perceive yourself, how you talk about yourself, and how you represent yourself eventually become the reality for you. And if it happens that you're putting yourself down, belittling your worth, and making light of your talents in the face of others, then you will come across as self-effacing, low in self-esteem, and almost a part of the wallpaper. This isn't humility, it's self-denial and an attempt to lessen your presence. On the other hand, if you exaggerate your qualities, talents, and skills, you'll come across as egotistical and arrogant but oddly enough, this is not about over-estimating your self-worth but about deceiving yourself through insecurity. There is a middle pathway and it is the one in which you recognize and celebrate the fact that

you are a valuable person, equal to everyone else, and that your talents and thoughts are unique and worthy.

Learn to overcome a fear of self-love. Self-love is often equated with narcissism, egotism, and some kind of one-way trip to introversion. This is probably partly because the English language has a hard time dealing with the word "love" – it has to cover a lot of territory for the many different types of love out there. It is also mired in the confusion people feel about the messaging to do good unto others, to always be charitable, and to give, give, give, of oneself. While these are noble intentions, they can often be taken out of proportion and used to downplay putting one's own needs and wants beneath those of others out of a fear of being perceived as selfish or inward-looking.

Trust your own feelings. Self-worth requires that you learn to listen to and rely upon your own feelings and not automatically respond to the feelings of other people. Once those around you establish that you'll respond to what they want, they lack any incentive to not make use of your responsiveness, and that sets a bind for you that can be hard to break (but break it you must). When you trust your own feelings, you will realize that when demands are placed upon you, you don't feel great and you will want to respond with what works better for you, or for both of you, rather than what works better for everyone else except you.

* Self-worth plummets when we let others make decisions for us. Initially this may seem like the easy route and one that allows you to avoid hard choices. Ultimately though, it turns into the hard route because you will always find yourself boxed in by what other people decide for you.

Analyze yourself. Many of us live in a culture that is very fond of going to see someone else to analyze us. Unless you've got a serious disorder, garden variety uncertainty and lack of purpose does not need analysis by someone else. It needs analysis by yourself so that you can clearly recognize where you're underestimating yourself and short-changing yourself.

Assignment: 1.Use the affirmations for using self esteem

2. Use/read the self nurturing component leaflet to develop self care.

3. Weekly mood diary

Assessment*

Session 7 COGNITIVE RESTRUCTURING AND SEXUAL ISSUES

REVIEW: 1. The Daily Mood Scale.

2. Homework – affirmations, etc

3. The purpose of this module.

I. COMMON THOUGHTS THAT MAKE YOU DEPRESSED.

A. What is wrong with these statements?

1. "I should be loved and approved of by everyone."

2. "I should always be able to do things well and work hard all of the time to feel good about myself."

3. "Some people are bad and should be punished."

4. "I will feel awful if things don't go the way that I want them to go."

5. "Other people and things I cannot change make me unhappy."

6. "I should worry about bad things that could happen."

7. "I can never be happy if I don't have someone to love me."

8. "I can't change the way I am; I was raised this way."

9. "I must feel sad when people I care about are having bad times."

10. "It will be awful if I don't do the right thing."

II. MORE PRACTICE WITH THE ABCD METHOD.

A. Review:

A is the **A**ctivating event (what happened).

B is the **B**elief (or the thought that you tell yourself about what happened).

C is the **C**onsequence (what we feel after we have thought about what happened).

D is the **D**ispute (the way you feel can change the thought so that you do not feel so sad or angry).

III. Sex

a) Part of getting back into a normal routine involves resuming a healthy sex life. The need to love and be loved, and to have the physical and mental release sex provides, is important. But, having sex after stroke can present problems or concerns for you and your partner. Stroke can change your body and how you feel. Both can affect sexuality.

Specific issues affecting intimacy after stroke: By itself, stroke is almost never a direct cause of sexual dysfunction. Instead, there appears to be a time of adaptation after the stroke in which sex life is halted. Studies show that this is a temporary stage. For instance, one study found that 80% of men who report erectile dysfunction after stroke regained function spontaneously a few months later. However, the couple may continue to suffer from sexual dysfunction for years after a stroke.

a. **Fear of another stroke:**Many people believe that once a person has suffered one stroke, excitement from sexual activity could cause them another stroke. This is rarely the case. In rare occasions a patient with advanced heart disease, might be asked by his doctor to minimize physical demands on the heart (even from sex) in order to prevent a heart attack.

b. **Decreased Libido:**

Decreased libido after stroke can be expected from several psychological factors, including low self esteem, uncertainty about the future of a relationship, preoccupation with finances, and difficulties accepting a new life with disability. Alternatively, decreased libido can be caused by some medications including antidepressants, and high blood pressure medicines (e.g., beta blockers.).

c. **Immobility**

Strokes can affect the areas of the brain that control arm and leg movements, thus preventing couples from achieving the sexual positions they enjoy most. Of course some people are more affected than others by this, depending on the extent of damage to the brain caused by the stroke, and the sexual gymnastics of a couple was used to performing before being affected by the stroke.

d. **Depression:**

Several studies suggest that depression dampens sex after a stroke by affecting both the stroke survivor, and his or her partner. There is still a question, however, about whether it is depression itself that dampens sex or whether it is its treatment, as decreased libido is one of the most common side effects of antidepressant medications.

e. **Damage to sex areas of the brain:**

As stated above, strokes rarely are the direct cause of sexual dysfunction. However, some strokes can affect sensation from the genital area, leading people to feel numbness around their genitals. Other strokes can cause people to fail to recognize their own genitals. Of course, either of these cases would make sex difficult. Strokes

that affect the hypothalamus, an area of the brain involved in the control sexual hormones, can also affect a person's sexual drive. In some rare instances a stroke can also cause increased sexuality, or unusual and inappropriately explicit sexual behavior, is caused by.

b**. What can I do to improve my sexual life after stroke?**

Start by re-introducing familiar activities such as kissing, touching and hugging.

Create a calm, non pressure environment where both of you will feel comfortable.

Sex therapy is the most effective way to improve sex after stroke. It is expensive, however, and it might not be covered by your insurance.

You must have open communication with your partner.

Ask your doctor whether it is possible to change medications in your regimen, which could be affecting your sexual drive.

While you should strive to recover function every day, you should understand that accepting your disability is an important first step towards re-establishing your sexual life.

Be bold and explore your sexuality in new ways whether you do this alone or with a partner.

HOMEWORK:

1. Continue the Daily Mood Scale.
2. Continue working on your thoughts.
3. Continue practicing the ABCD Method
4. Discuss your fears about sex and sexuality with your partner – plan a weekend ahead
5. Weekly mood diary

Sessions 8 **SPIRITUALITY AND MEANING LIFE, SELF ESTEEM BOOSTING**

Spirituality is an inner drive to enter into relationship with others and with the ultimate other. It is
innate in all human beings.

I. Science understanding spirituality in rehabilitation.

A growing body of research indicates the positive roles that religion and spirituality play in overall health and well-being. If you're recovering from a stroke, drawing on your spiritual beliefs can help you come to terms with your struggles, adjust to your impairments and infuse new meaning into your life. Though religion is rarely introduced in rehab settings, you can personally turn to prayer, meditation and religious literature to help you cope with what can be a long, arduous recovery. In addition, consider asking friends and religious leaders to visit you regularly, pray with you and spend time discussing how spirituality can benefit the total healing process.

II. Levels of Loss of relationship in stroke

1. Sense of disconnection with ourselves a) Physical, mental or emotional challenges

b) Self- image issues

c) Isolation

d) Not being understood

e) Not being supported

f) Stress and conflict with changing role and relationships

g) Dependence on others

2. Loss of Connection with the Ultimate Being:

- Why?
- Sense of unfairness
- Anger

III. All aspects of spirituality can be affected by crisis

• Hope

• Holy

• Community

• Meaning

Question: What has been your experience?

IV. Meaning of Living

a) What is the meaning of life? Why are we here? Is there a God or isn't there, and if there is a God, what is its nature? Of all the world's religions, which one is the most correct? Is there an afterlife? Are we primarily physical beings or spiritual beings? People have struggled for millennia to tackle these questions. Wars have been fought over them. But as much as these questions cause people to lose their heads (sometimes figuratively, sometimes literally), the bottom line is that these are very practical questions.

b) What determines the goals you set (or don't set) is your context. Your context is your collection of beliefs and values. So if the values of money and freedom are part of your context, you might be inclined to set a goal to start a new business. But with different kinds of values — a different context — you may be disinclined to set goals at all.

c) Your context works like a filter. When you are inside a particular context, you lose access to the potential goals, projects, and actions that lie outside that context. For example, if your context includes the belief that life after stroke is bad, then you aren't likely to work towards becoming a future leader despite your stroke.

V) Self esteem boosting

Repeat the self nurturing of the self esteem boosting.

Assignment: identify ways of becoming more spiritual with your supreme being (at least five)

Use/read the self nurturing component leaflet to develop self care.

Weekly mood diary

Session 9 SUMMARY AND REPLASE PREVENTION

I. Explain again that the purpose of the therapy is to treat depression by teaching ways to control our mood better and gain mastery over our lives and not to be dependent on therapist.

II. Summarize the progress made as well as a structure for insuring continued improvement. Participants again rate the frequency and their reactions to "target" behaviors identified in the first session. Therapist and participants review treatment gains, identified skills and strategies the participants plan to continue using

Question? a) What have you gained in the sessions?

b) What do you want to still know/ not too clear about?

c) Is your expectations met?

III. Summary of sessions 1-8

*How thoughts affect mood

*Problem solving skills and pleasant events

*Distorted thinking and social interaction

*Understanding dysfunctional coping

*Caregivers' burden and daily living

*Building self worth and confidence

*Cognitive restructuring and sex issues

*Spirituality and meaning of life

IV. Understanding end of CRT is not end of interaction

Relapse prevention strategies

It's not depression to feel bad once in a while but staying down is the problem

Practice make perfect (rehearse skills taught/read books given)

Tell people how to stay out of depression

Write down your journey with post –stroke depression with Clinical psychologist in nine weeks.

Personal assignment: My journey through Post-stroke depression with psychotherapy

Assessment*

Thank you for coming for these nine sessions and is there something you wish we had added to the sessions? Please tell the research assistant.

Plate I: Cognitive Rehabilitation therapy session in progress

Plate II: Psycho-education session in progress