

DEPARTMENT OF PSYCHOLOGY

UNIVERSITY OF GHANA, LEGON

**COGNITIVE AND BEHAVIOURAL FUNCTIONING AMONG SURVIVORS OF
SPINAL CORD INJURY (SCI)**

BY

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**THIS THESIS SUBMITTED TO THE DEPARTMENT OF PSYCHOLOGY,
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DECLARATION

This is to certify that this thesis is the result of research undertaken by Teku Charity Ama towards the award of the M. Phil in the Department of Psychology, University of Ghana.

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ABSTRACT

This study examined the cognitive and behavioural functioning of patients with Spinal Cord Injury (SCI). Further, it examined whether the adherence to cultural Africentric values has any significant influence on the quality of life (QOL) among Spinal Cord Injury patients. Ninety (90) participants comprising 45 patients and 45 healthy controls between 18 and 70 years of age were sampled for this study. They were administered tests assessing cognitive failures, attention, fluency, memory, in addition with measures of Quality of Life, Psychological Health and Cultural Values. The results revealed that SCI patients obtained significantly lower test scores on cognitive functioning tests such as working memory, attention, fluency, and self-reports of memory failures. Additionally, SCI patients reported lower general quality of life compared to the healthy controls. Depression, anxiety and somatization scores were significantly higher for SCI patients than the healthy controls. Further, adherence to Africentric values among SCI patients had a significant positive association with quality of life. The findings were discussed in line with theories and previous studies. The limitations, implications and recommendations of the findings were also discussed.



DEDICATION

To

My Beloved husband

Paul Kuwornu,

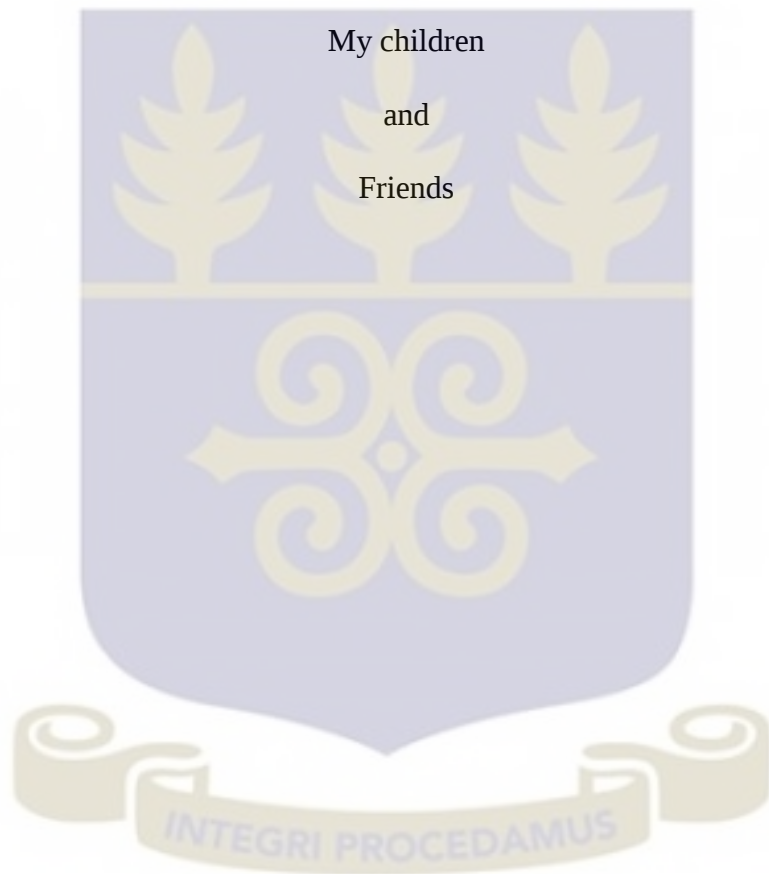
My lovely mother

Comfort Gyamea,

My children

and

Friends



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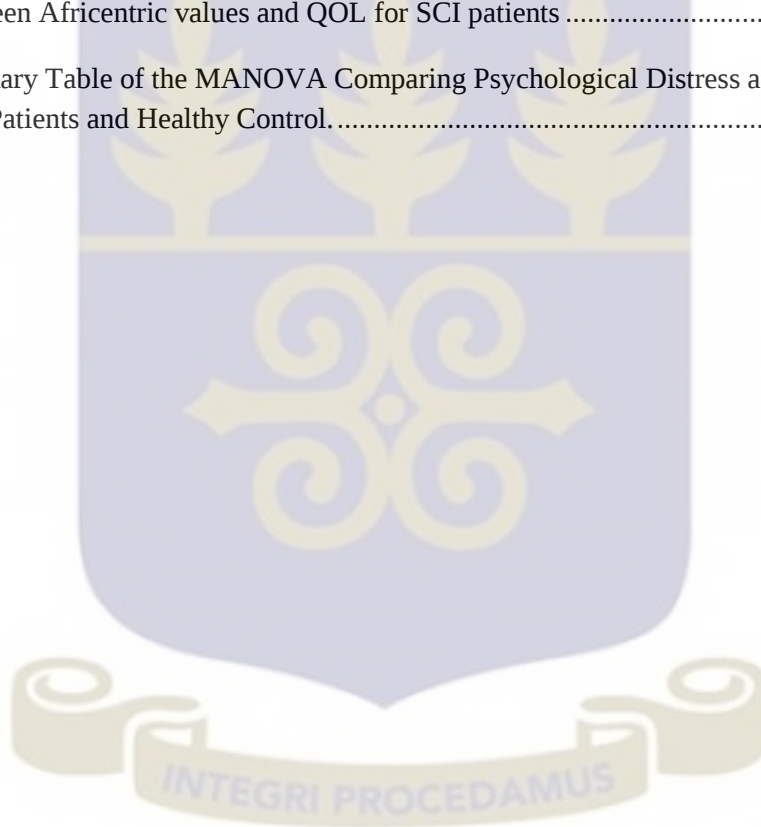
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LIST OF ABBREVIATIONS / ACRONYMS

ANOVA	Analysis of Variance
AWS	Africentric Worldview Scale
BDS	Backward Digit Span
BSI	Brief Symptom Inventory
CFQ	Cognitive Failures Questionnaire
COWAT	Controlled Oral Word Association Test
CTT	Consonant Trigrams Test
FDS	Forward Digit Span
JHS	Junior High School
MANOVA	Multiple Analysis of Variance
QOL	Quality of Life
SCI	Spinal Cord Injury
SHS	Senior High School
SPSS	Statistical Package for Social Sciences
WHOQOL-BREF	World Health Organization Quality of Life Assessment- BREF

CHAPTER ONE

INTRODUCTION

Background to the Study

Spinal cord injury (SCI) can be defined as an overwhelming condition which has both somatic and social effects as well as emotional complications that the victim suffers (Rathore, 2010). SCI is capable of affecting all facets of the sufferer's functioning. These may include the somatic, behavioural, mental, emotional and social functions (Singh, Rohilla, Siwach, Dhankar & Kaur, 2012). According to Craig and Perry (2008), the physical or medical effects of SCI may include loss of movement and pain. Dijkers (2005) also reported depression and anxiety to be common in individuals affected by SCI, with many patients feeling that they may never recover from the injury and may never return to their pre-morbid state of functioning. This points to the psychological ramifications of the condition. Cognitive effects of SCI are usually associated with attention, memory and neuropsychological deficits (Singh et al., 2012). Moreover, some researchers assert that, as life expectancy is gradually improving due to the creation of sophisticated spinal care departments. The improved life expectancy of patients therefore, is now reliant on the secondary problems associated with the injury (Kreuter, Siosteen, Erkhholm, Bystrom, & Brown, 2005). SCI patients who have access to good rehabilitation are able go back to their pre-morbid state of functioning (Kreuter et al., 2005).

Noggle, Dean and Horton (2012) defined SCI as a harm to the spinal cord which leads to deficits or interruption in normal sensation and/or motor function. Symptoms associated with SCI can differ extensively depending on the location of damage on the spinal cord and the nerve roots damaged. Incontinence, severe pain and paralysis are some of the the SCI symptoms (Kirshblum, Campagnolo & Delisa, 2009; Lin, Cardenas, Cutter, Frost &

Hammond, 2009). Although SCI could be described as a relatively uncommon condition, the ramifications of the condition can be extremely overwhelming (Middleton, Tran & Craig, 2007). SCI typically results in lifelong paralysis of controlled muscles underneath the point of the injury, reduction in movement, deficits in social and occupational functioning, as well as adverse effect on major organs and systems in the body (Sommer, 2001). As a result of enhanced life expectancy, the pervasiveness of SCI is on the rise and requires to be treated with all urgency.

SCI survivors are reported to demonstrate both primary and secondary mechanisms of injury (Noggle et al., 2012). The primary mechanism of injury is largely associated with the pathophysiology of the injury. The initial impact may lead to contusion, compression, laceration, disruption, and/or trisection of the spinal cord. Cell injury and death result in addition to axonal demyelination (Taber & Venes, 2009). Secondary mechanisms on the other hand refer to various developments or changes that follow an SCI. These changes or processes involve vascular changes, electrolyte changes, biochemical changes, loss of energy metabolism, loss of neurotrophic factor support, free radical formation, and glutamate excitotoxicity and consequently aggravate the initial injury (Taber & Venes, 2009). For instance, SCI may initially result in hypertension and an increase in heart rate followed by an extended period of bradycardia and hypotension.

Turnpike (2013) referred to the physiological mechanism of spinal cord injury as the abrupt shock to the vertebrae column, which causes fractures or dislocations in the vertebrae. The damage usually commences at the very instant of the damage when displaced bone remains, disc material, or tendons slit or bruise into spinal cord tissue. Many spinal cord injuries do not entirely break it, rather, they usually cause breakages as

well as compressions of the spinal column. The spinal cord then crashes and leads to the destruction of axons [the long extensions of neurons that transmit signals to and from the spinal cord] (Turnpike, 2013). A spinal cord injury may either destroy a few, many, or almost all of axons in the affected centres of the spinal cord. Also, while some injuries result in complete paralysis, others allow for almost a complete recovery to premorbid functioning depending on the degree of the damage (Turnpike, 2013).

SCIs are usually categorized as either complete or incomplete SCI (Turnpike, 2013). An SCI is described as incomplete when the capacity of the spinal cord in transmitting impulses back and forth the brain has not been entirely prevented as a result of the injury or damage (Turnpike, 2013). In this case, patients still maintain some level of motor and sensory functioning typically underneath where the injury is located. Contrarily, a complete injury is said to have occurred in the case where motor and sensory abilities are lost totally. Injuries affecting the first, second, or third cervical vertebrae are frequently reported to be the injuries associated with the highest mortality (Turnpike, 2013).

The causes of SCI are multifactorial. Common reported origins of injury to the spinal cord include; trauma (resulting from car or motorcycle accidents, gunshot, falls, sports injuries, among others) and violence. Mehanes and Sands (2007) as cited by Taber and Venes (2009) emphasized that “SCI is commonly associated with events that cause abrupt, forceful acceleration and deceleration such as vehicular accidents” (p.1459). Similarly, O’Connor (2006) observed that SCIs commonly result from motor accidents, falls (especially among the elderly), and sports injuries. Additional risk factors include alcohol and drug use (Noggle et al., 2012; Sekhon & Fehlings, 2001). The spinal cord injury level is usually denoted with alpha numeric values depending on the affected section of the

spinal cord, for example; C4, T5, L5 among others (Turnpike, 2013). The Rehabilitation and management program for SCI patients usually involves a combination of physiotherapy and skill-building activities in order to restore some level of loss functions among patients.

Demographical disparities exist among patients with SCIs, for instance, Noggle, Dean and Horton (2012) suggested that males and young adults between the ages of 21-30 years are at an elevated risk of suffering from an SCI. Noggle et al. (2012) further indicated that the aetiology, location, grade of harm, and the individual's age during the period the damage occurred are variables that influence prognosis following SCI. More severe neurogenic impairments and injury at a younger age (15 years or younger) are also associated with increased mortality rate (Shavelle, DeVivo, Paculdo, Vogel & Strauss, 2007).

SCI and Quality of Life

Quality of life (QOL) refers to wide-ranging human experiences which are related to a person's overall well-being, which may be influenced by several of non-medical variables like economic status, individual freedom, and personal environment (Revicki et al., 2000). According to Wood-Dauphinee and Exner (2005), QOL includes the things an individual values in his or her life. As a result of the importance of the individual's perception, the measure of QOL is largely dependent on the person's personal appraisal of that which is valuable to him or her, such as physical well-being, functional capacities, relations, health, reverence from significant others, work and family. The World Health Organization (Szabo, 1996) defined QOL as people's evaluation regarding their current state of life with reference to the cultural underpinnings and value systems of the society in which they reside, as well as the objectives, anticipations, values and worries they may have. QOL

hence can be said to be the reflection of an individual's overall appraisal of and contentment with the current state of his/her life (Hartkopp, Brønnum-Hansen, Seidenschnur & Biering-Sørensen, 1997; Siosteen, Lundqvist, Blomstrand, Sullivan & Sullivan, 1990; Whiteneck, 1994; Wood-Dauphinee & Exner, 2005)

QOL has been found to deteriorate as a result of SCI (Dijkers, 2005; Geyh, 2013; Hammell, 2004). According to Gurcay, Bal, Eksioglu and Cakci (2010) SCI may hinder health-related QOL to some extent, depending on the patient's age, neurological capacities, functional status as well as the presence or absence of complications (mainly bladder incontinence). SCI has been referred to as one of the worst tragedies an individual could ever suffer (Dijkers, 2005). Medical or physical ramifications of SCI are reported to be linked with reduced QOL. Dijkers (2005) for instance, averred that recognizing their state of paralysis, bladder and bowel incontinence, loss of independence, mobility restrictions, and increased possibilities of successive complications (like pressure ulcers), most patients only anticipate poor quality of life and as a result determine that life is no longer worth living. In addition, psychologically, some patients do not only perceive low quality of life but very often than not attempt or succeed in committing suicide (Dijkers, 2005). This usually occurs during moments of depression and hopelessness that is usually common after SCI (Dijkers, 2005; Kewman & Tate, 1998).

SCI, Behavioural and Cognitive functioning

SCI patients usually experience relatively permanent changes in their life following the injury. Patients with SCI may experience personality, behavioural and cognitive changes following the injury, especially those with concurrent traumatic brain injury [TBI] (Dezarnaulds & Ilchef, 2013). As stated by Dezarnaulds and Ilchef (2013), variations in

personality, behavioural and emotional states may include: impulse control problems, unstable mood, depression, lethargy, aggression, nervousness, poor insight, disinhibition and problems with self-monitoring.

Cognitive assessment has also revealed that between 40% and 50% of SCI patients have indication of some cognitive deficits (Davidoff, Roth & Richards, 1992). Some of the deviations in cognitive functioning are concentration deficits, memory impairments, difficulties in problem solving and organization, deficits in initiation, decision making and abstract reasoning (Dezarnaulds & Ilchef, 2013). Davidoff et al. (1992) also reported impairments in memory, attention, concentration, new learning, abstract reasoning and higher level cognition. Similarly, Emerich et al. (2012) identified the evident signs of cognitive deficits as anxiety, hostility, disinhibition, memory loss, and disordered mental state.

Statement of the problem

Globally, between two hundred and fifty thousand and five hundred thousand people are estimated to have been victims of spinal cord injuries yearly (WHO, 2013). Individuals who suffer SCI go through instantaneous, intense, and long-lasting life changes (Singh et al., 2012). Due to the characteristics of most of the injuries and the reason that there are wide-ranging likely sources of premorbid cognitive deficits, victims of SCI repeatedly have to deal with the additional difficulty of going through rehabilitation with pre-injury or accident-related cognitive impairment (Warren, Pullins & Elliott, 2008). According to these authors, pioneering research on challenges SCI patients face suggest that between 25% and 57% of acute SCI patients may have a concurrent traumatic brain injury, making their situation even worse. Other studies further found that about 67% of SCI patients

undertaking various rehabilitation programs may have varying degrees of cognitive deficits (Warren et al., 2008). Premorbid factors identified to compound the challenges of SCI patients include: pre-injury drug and alcohol abuse, psychiatric conditions and enduring personality disorders such as schizophrenia, depression and antisocial personality disorders, prescription medications, cognitive impairment prior to injury, premorbid intellectual ability, other medical conditions such as osteoporosis, TBI, educational, or occupational functioning, and age related cognitive decline (Hess, Marwitz, & Kreutzer, 2003; Wallen, Pullins & Elliott (2008).

SCI has costly consequences, for the sufferer and the society as a whole. These patients often become dependent, either left out of school or they suffer decreased employability. Moreover, they have a high risk of premature death (WHO, 2013). In developing countries such as Ghana, the circumstances are no different, if not even worse. For instance, majority of SCI patients in Sierra Leone reportedly do not survive after a few years of injury (Gosselin & Coppotelli, 2005). What compounds the situation for people who suffer SCI is lack of income (Weerts & Wyndaele, 2011). The QOL of SCI patients depends greatly on the availability of a facilitating environment; thus there is availability and accessibility of appropriate resources and services as well as supportive relationships and community inclusion (Weerts & Wyndaele, 2011; WHO, 2013). QOL following SCI is also dependent on whether SCI becomes an obstacle whenever there is a need to confront discriminatory attitudes (WHO, 2013). The implication of this for SCI patients in Ghana is that the limited availability of facilities and the generally high levels of poverty is likely to affect the prognosis and QOL of these SCI patients.

It has been reported that individuals with a dual diagnosis of primary SCI and comorbid cognitive impairment are at substantial risk for both complicated rehabilitation programs and unfavourable outcomes (Davidoff et al., 1992; Emerich, Parsons & Stein, 2012). The cognitive impairments resulting from SCI with a probable poor quality of life can make rehabilitation and recovery very problematic. Majority of people with neurological impairments also experience physical, cognitive, behavioural or emotional problems which they have to face with their families or caregivers. The problem is further aggravated in developing countries especially, where availability of individual psychological interventions, reliable support groups, cognitive remediation or rehabilitation programs, financial assistance, occupational therapy and caregiver resources is scarce (Arango-Lasprilla, 2015). Further, whereas the SCI Model Systems of Care points out an approximately twelve percent of the entire SCI population to exhibit obvious symptoms of cognitive deficits, research findings reported an incidence rate of dual diagnosis/comorbidity of mild brain injury as high as 24% to 54% that often go undetected (Macciocchi, Seel, Thompson & Byam, 2008).

Furthermore, findings by Gurcay, Bal, Eksioglu and Cakci, (2010) suggest that QOL of SCI patients is significantly reduced. There is therefore an obvious need for more attention to be paid to issues confronting SCI patients in order to develop comprehensive management and rehabilitation framework for their recovery. It is these profound findings and conclusions from previous findings that necessitate this study. The findings of the present research would propose ways of helping patients who suffered SCI augment their quality of life and cognitive function.

Aim and Objectives of the Study

The present study broadly aims to investigate the cognitive and behavioural functioning of spinal cord injury patients. The specific objectives are to:

- Determine the QOL and cognitive functioning of patients with SCI in Ghana.
- Determine if cultural (Africentric values) factors influence the QOL of patients with SCI.
- Examine whether significant differences exist between SCI patients and Healthy controls in their level of psychological distress (Depression, Anxiety and Somatization).

Relevance of the Study

SCI is a serious condition which requires a holistic approach in its management and care. Nonetheless, the health care system in Ghana focusses only on the physical needs of SCI patients. This study seeks to determine cognitive functioning and quality of life among SCI patients. The findings from the study would inform stakeholders on areas to include in the rehabilitation and management regime of these patients. The study would also lay the foundation for many more studies in the field of SCI and its management in Ghana, as well as add to existing literature.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The current chapter discusses theoretical bases for the present research. It also includes a thorough review of previous related literature. Grounded on the reviewed literature, the tested hypotheses in the current study are stated in this chapter. The chapter also contains the operational definition of terms.

Theoretical Framework

The current study is grounded on a number of theories. They include the Executive Function (EF) theory, the Theories of Psychological Adjustment and the Integrative Quality of Life Theory. The EF theory form the theoretical bases for examining cognitive functioning among SCI patients. The theories of Psychological Adjustment and Integrative Quality of Life Theory form the theoretical underpinning for behavioural functioning (QOL and psychological health).

Executive Function Theory

Executive functions (EFs) are neurological mechanisms that sustain an appropriate problem solving mechanism to achieve a future goal (Burgess & Alderman, 2004). Stuss and Benson (1986) also defined EFs as advanced mental activities such as planning, organization, goal selection, initiation, anticipation, goal-directed activity, execution, and self-regulation.

EFs involve manifold distributed neural networks in the human brain, that comprise of the thalamus, basal ganglia, and prefrontal cortex (Middleton & Strick, 2001; 2002;

Pennington, 2002). In Stuss and Benson's (1986) model of executive functions, EFs have been ascribed to the prefrontal cortex with its cortical and subcortical neural networks in the brain.

To describe EFs in a less complicated model, EFs are said to denote "top-down" cognitive inputs which enable decision making via the maintenance of information about likely choices in the working memory and incorporating the knowledge into a framework of information about the present context in order to determine the optimal action that is required for the particular situation at hand (Middleton & Strick, 2001; 2002; Pennington, 2002). This implies that the mechanism by which EFs work begins from the higher level cognitive processes in the prefrontal cortex to lower level cognitive functions via the neural systems in the cortical as well as subcortical regions of the human brain in order to initiate the right action. Hence, EFs are very crucial for activities of daily living.

SCIs usually result from traumatic or violent incidence, hence many sufferers of SCI may have concomitant brain injury and the prefrontal areas of the brain (an essential area responsible for EFs) are particularly vulnerable to Traumatic Brain Injury. Moreover, acceleration-deceleration forces arising from causes of SCIs such as automobile accidents, falls among others, usually lead to diffused damage to the axons which can cause damage to several structures and regions of the brain, especially the anterior parts (Dade & Black, 2002). These diffuse injuries may consequently cause executive function deficits via a decline of the adept processing of information, though there may be no particular injury to the prefrontal cortex. Meanwhile the anterior lobes have been acknowledged as the key areas of the brain accountable for executive functions (Anderson & Tranel, 2002; Stuss & Levine, 2002), a great likelihood therefore exists that patients with SCI will exhibit some

level of impairment in executive function (Dawson et al., 2004). Executive function impairments following SCI that have been reported in the literature include: deficits in mental agility, difficulty in adjusting to unique activities (Dikmen, Reitan, & Temkin, 1983 as cited by Stuss & Levine, 2002), poor judgement (Stuss & Levine, 2002), reduced sense of self-efficacy, deficits in self-monitoring and impaired impulse-control as well as planning and decision-making deficits (Anderson & Tranel, 2002).

In linking this theory to SCI, it can be argued that a person who suffers SCI possibly has experienced damage to the manifold dispersed neural systems including the thalamus, basal ganglia, and prefrontal cortex (Middleton & Strick, 2001, 2002; Pennington, 2002). It is however not clear the extent to which SCI may directly affect executive functions and the specific functions that are affected. The theory also does not differentiate between executive dysfunctions due to direct insult to the prefrontal cortex and those resulting from diffuse axonal injuries in other areas of the frontal lobe and other brain structures. It can also be asserted that since SCI may cause diffuse axonal injury affecting the frontal lobes and other related structures, then other cognitive functions may be affected even to a greater degree than EFs in themselves.

It is therefore essential to go beyond the assessment of executive functions alone in the case of SCIs to assess other cognitive functions which may be compromised following the injury as well as detect the particular areas of dysfunction among individuals who suffer SCI with or without traumatic brain injury.

Theories of Psychological Adjustment

SCI is a serious condition that does not only affect the physical body of patients but also their psyche and hence requires a life-long process of psychological or emotional adjustment (Westie, 1987). According to Westie (1987), the process of Psychological adjustment among SCI patients can be broadly conceptualized based on three major models which explain the psychological mechanisms that occur following SCI in terms of adaptation to this devastating life event. The present study would however focus on only two of these models. These models are not mutually exclusive, when used complementarily, an indepth and better insight regarding the complexities of the psychological adaptation process in SCI is obtained (Westie & McKeon, 1987).

Among these models is the “stages theory” which was built on the tenets proposed by Kubler-Ross (1969) and Lindeman (1944) in their research on the process of grieving and death and dying (Westie & McKeon, 1987). Based on the tenets of this theory SCI patients go through a similar process as individuals adjusting to a major loss or faced with death and dying. According to this theory, the adjustment process occurs in stages; starting from the stage of “shock and denial”, thus the stage at which the individual is hit initially by the loss and finds it difficult to belief the reality of the loss (Kubler-Ross, 1969; Westie, 1987). This stage is then followed by the “depression stage” when the patient begins to feel depressed about the reality of the loss, which is then followed or alternated by the stage of “anxiety”. The stage of “anger” is the next stage which involves a state of irritability characterized by the feeling that life has probably been unfair (Kubler-Ross, 1969), from this stage of anger the individual enters the “bargaining stage”. This stage is characterized by the hope that the individual can somehow postpone the loss or avert it. The final stage

is “acceptance and adaptation”, here the individual comes to terms with the loss and begins to harness resources to cope with the loss.

As acknowledged by Kubler-Ross (1969), these stages do not always occur sequentially and do not also occur in everybody adjusting to loss in the same way. In fact he suggested that the reaction to illness, death, and loss are as unique as the individual experiencing them and that some people may get stuck in one particular stage such as depression, anxiety or anger. Also, an individual may pass through a particular stage more than one occasion (Westie, 1987). The stage model even though not universal, helps in understanding the psychological processes that SCI patients may be going through in adjusting to their illness and loss of certain functions.

Another model that is very important in understanding psychological processes involved in SCI is the "developmental" theory, developed from Erikson's theory of psychosocial development (Erikson, 1964; Westie, 1987). This theory suggests that the traumatic experience from SCI among adult patients leads to a natural regression in the developmental process. The SCI patient will then have to try to re-master some of the developmental tasks such as basic trust, a sense of autonomy and initiative that were earlier on mastered or resolved during the developmental stages in childhood. In other words, SCI patients have to go through the physical and emotional tasks of infancy and childhood all over again since they have regressed to a state of dependence following the injury (Westie, 1987). The rehabilitation and recovery process is crucial for regaining these lost developmental milestones and as the patient begins to master these lost tasks to gain independence, they go through the adolescent crisis of separation from parental figures [thus caregivers in the case of SCI] (Westie, 1987).

Relating these theories to psychological functioning and QOL of SCI patients, taking the “stages theory” for instance, it can be implied that the shock, anxiety and depression which the SCI patients go through will affect their subjective and objective sense of wellbeing. It will also affect their satisfaction with life physically, psychologically, socially and emotionally. Further, the developmental theory indicates that SCI affects the psychological development of patients markedly and this can pose a great burden to their psychological health and QOL. The abrupt change from independence to dependence and reworking one’s way back to independence would require a lot of emotional energy which may lead to emotional exhaustion and the psychological consequences that may come with it. Building on Westie’s (1987) emphasis on the importance of the rehabilitation process, the psychological outcome may depend largely on the quality of rehabilitation available to the patient and how long it takes to regain that independence.

However, the major weakness of these theories has to do with the marked individual differences demonstrated by SCI populations in going through the stages as well as the outcome of the illness or loss (Kubler-Ross, 1969; Westie, 1987). Thus some people may be more resilient than others.

The integrative theory of quality of life (Ventegodt, Merrick & Andersen, 2003)

The integrative theory is an extension of Maslow’s (1962) theory and it incorporates three types of quality of life (the subjective, the objective and the existential quality of life) into a sole theory of QOL. According to Ventegodt and his colleagues (2003), subjective QOL refers how good an individual feels about his or her life. That is to say, the degree of a person’s contentment with his or her life and happiness. An individual’s view about a satisfactory or happy life is influenced by the culture of the society the person lives in (Ventegodt et al., 2003).

The objective quality of life on the other hand reflects an individual's capability to acclimatize with the value system of a particular culture and does not focus on the person's life. An example may include the social status an individual ought to attain to be considered a good member of a particular culture. In this case, a person who is able to achieve this social status may be considered to have a good (objective) QOL.

The existential QOL also does not depend on the person's personal appraisal of how satisfying their life is, but is concerned with outside variables, which many observers can give similar ratings to. These three types of quality of life are made up of concepts pertinent to QOL that seem to overlap.

Relating this to the case of SCI patients, being unable to meet many of the demands of daily living following the injury, they will perceive their lives as dissatisfying and would be unhappy with the current state of their lives. In addition, they may not be able to adapt to some of the cultural expectations of society (for instance a parent who is expected by society to fend for the family himself becomes a dependent). The individual may also be lacking in many other aspects in social functioning in the society, thus all aspects of quality of life is compromised (subjective, objective and existential) among SCI patients. As confirmed by Dijkers (2005) and Gurcay et al. (2010) indeed SCI patients' QOL is reduced and they mostly perceive their lives as dissatisfying and sometimes entertain suicidal ideas because they perceive their lives as worthless.

Review of Related Studies

Demographics and Epidemiology

It has been shown that SCI occurs in 40 per million population or around 12, 000 cases every year among survivors of traumatic accidents apart from those who die immediately after the accident in the United States (National Spinal Cord Injury Statistical Centre (NSCISC), 2013). Observing the demographic distribution of these incidence rates, SCI occurs more frequently in early adulthood (with an average age of 42.6 years from 2010 - 2013), males (80.7%) and single (51.6%). The most frequent cause was motor vehicle accidents [NSCISC, 2013].

In a similar vein, to examine the demographic profile of SCI patients in Bangladesh (which has the biggest SCI centre in southern Asia), Rahman (2013) reported that among the 426 purposively sampled patients, most of them were young adults with ages ranging from 32 years to 45 years and majority were males (constituting 87% of the patients). Married individuals among the patients were more than the unmarried (71% and 29 % respectively) which is contrary to the NSCISC report. This indicates the cultural variations in terms of marital status between the two continents (North America and Asia). Another variation is the cause of injury. Rahman (2013) reported that majority of the causes were due to falls from heights (43.7%) followed by motor accidents (24.2%).

Similar results were reported by Singh, Sharma, Mittal and Sharma (2003) who did an epidemiological study among traumatic SCI patients reporting to emergency and accident department between 2000 and 2001 in India. They found out that among the survivors of SCI, majority were males, with male to female proportion of almost 3 is to1. Participants were relatively young with the prevalent age ranging from 20-39 years. The most frequent

aetiology of injuries was fall from height (44.5%) and the second most frequent was motor accidents (34.7%).

These findings reveal that the epidemiology of SCI though similar across the globe has subtle differences in terms of the cause and some demographic variables among developed and developing countries (Rathore, 2010). What is obvious however is that SCI happens to males more frequently compared to females and also younger adults than the elderly though there may be variations in mean ages across cultures.

That notwithstanding, Ghana has no reliable national data concerning traumatic injury or SCI. The poor data gathering and record keeping culture of institutions involved in SCI rehabilitation further illustrates this problem.

The secondary complications of SCI/D in an individual of any age may include: reduced muscle power and joint flexibility, osteoporosis, deficient short-term memory, hypertension, decline in respiratory function, bowel dysfunction, orthostatic hypotension, skin thinning accompanied by loss of elasticity, kidney impairment, and incontinence among others, which are also the same changes often seen in the process of normal aging (Winkler, 2008). Therefore, an individual over the age of 60 who suffers from an SCI has an elevated risk of complications. Also, considering that the elderly have a greater likelihood of having comorbid medical conditions and intricate psycho-social profiles (for example; widowed, restricted social support system, financial difficulties, mood problems, just to mention a few), it is hence not shocking that the care and management involving the elderly with SCI is usually more intricate. Elderly SCI patients have a reduced likelihood to regain functional independence (Apple, Anson, Hunter & Bell, 1995; Furlan & Fehlings, 2009) and re-integrate into the community though they possess similar potential

for neurological recovery as others. The mortality rate for these patients is also significantly higher compared to their younger counterparts within the initial years of SCI (Furlan, Bracken & Fehlings, 2010).

Cognitive Functioning and SCI

Cognitive deficits have long been identified and reported among SCI patients (Rathore et al., 2008). However, according to Grahn, Mallory, Berry, Hachmann, Lobel and Lujan (2014), since motor commands originated from the brain move via downward pathways in the spinal cord towards efferent nerve cells and then to effector muscles, injury to these pathways through SCI can lead to paralysis in body parts beneath the level of the lesion, though, such areas as the centres for planning in the brain, peripheral nerve cells and muscles affected may continue to be intact. This implies that a person who suffers SCI may have problems with movement but not necessarily with planning and coordination aspects of movement. Grahn et al.'s assertion suggests that cognitive functions that may be affected in SCI may only be those directly linked with the paralysis suffered by the patient and that other associated cognitive functions may be preserved. On the contrary, other researchers reported significant deficits in cognitive functions not directly linked with paralysis such as deficits in abstract reasoning and problem solving (Rathore et al., 2008).

Results from researches on cognitive functioning among SCI sufferers continue to intrigue scholars till date. To this end Saeidiborjoni, Moradinaza, Saeidiborjoni and Ahmadi (2013) conducted a case-series research using a sample of 57 SCI patients reporting at the emergency department of Taleqani Trauma Centre between the year 1999 and 2011. Sensory and motor abilities were assessed. Findings revealed that a large number of patients (43%) had a complete SCI while 57% of the patients had incomplete injuries.

The authors therefore arrived at the conclusion that complete and incomplete SCIs are equally vital since the outcome of SCI has direct link with the site and severity of the injury. That is to say, both complete and incomplete SCIs have impact on sensory and motor functions of the central nervous system (CNS). Since sensory and motor functions are facilitated by nerves with distributed neural network throughout the CNS, damage to some parts of this neural network may affect other related cognitive functions. By extension, it could be asserted that deficits in sensory and motor functions may lead to other cognitive deficits.

In addition, Dowler et al. (2011) in their review averred that previous studies showed that 10% to 60% of the SCI sample retained residual cognitive impairments after the injury. The weaknesses of these previous studies however is that, the researchers failed to use comprehensive cognitive battery and a well-matched control sample. (Roth et al., 2009; Singh et al., 2012). Therefore, motivated by the need to correct the limitations of previous researches, these authors compared the performance of a chronic SCI sample with a matched control sample using four areas of cognitive functioning (these are: Memory, visuo-spatial abilities, attention or executive function and processing speed). Outcomes of the analysis showed that the area of cognitive functioning that showed the greatest difference between the SCI and healthy control groups was information processing speed, as 29% of the SCI sample performed 1-2 standard deviations below the average score obtained by the non-SCI sample after controlling for psychological status and alcohol history. This result revealed the essence of cognitive assessment following SCI.

Similarly, Roth et al. (2009) conducted a comparative research among acute SCI patients and healthy controls. Their review of previous literature suggested that even though approximately, forty to sixty percent of survivors of acute traumatic SCI exhibited cognitive deficits, generalizing the results from these studies is quite limited because there most studies make use of inadequate cognitive testing techniques and also do not match the SCI group on a control group. To correct these identified limitations of previous research, Roth et al. in a collaborative investigation therefore sampled 81 patients with acute SCI and 61 healthy control participants ranging from 18 to 55 years old. The participants were assessed via a comprehensive cognitive battery that did not require motor ability. It was observed that, patients performed significantly poorer on cognitive functioning tests than the matched-control group on all tests but for two. The areas of difficulty for the SCI group were; attention period, initial learning, concentration, memory and problem solving.

In a related study, Dowler et al. (2007) examined cognitive ability among chronic SCI patients and the influence of moderating factors to identify normal and deficient cognitive functions among chronic SCI patients that could be clinically useful. The sample consisted of 91 SCI patients and 75 control subjects. Combined scores of performance in different cognitive areas were generated. Results revealed that 60% of the SCI group showed clinically significant impairments in one or more cognitive areas. The study also revealed that, although cognitive functioning of SCI patients was influenced by age and premorbid intellectual level, it was concluded after controlling for these variables that, cognitive deficits identified were probably as a result of a latent concurrent head injury.

On the contrary, in Hess, Marwitz and Kreutzer's (2003) comparative study in which they compared cognitive functioning between individuals with SCI and those with mild traumatic brain injury (TBI), thirty-three matched pairs of SCI survivors or minor TBI were sampled and data collected prospectively. Performance on five out of the ten cognitive scales administered, no meaningful group variances were found. For the other five measures, the SCI group performed significantly better than the TBI sample. This finding suggest that, perhaps many of the cognitive function deficits found in other studies among SCI patients may be partly attributable to possible concomitant TBI.

From the studies reviewed above, it can be surmised that a significant negative relationship exist between cognitive and SCI development. Indeed, it can be concluded that cognitive function significantly diminishes following the development of SCI. It is however not clear extent the extent to which the relationship exist and the specific functions that are likely to be compromised because there is no consensus as far as the literature is concerned. The present research is therefore tailored toward the examination of this relationship further within the Ghanaian context.

Quality of life (QOL) among SCI patients

Gurcay and others (2010) primarily investigated the QOL of SCI patients and also determined the impact of socio-demographic and clinical variables on QOL among these patients. To achieve these objectives, a cross-sectional research was used involving 54 SCI patients. It was found that, younger patients scored higher on bodily pain. It was revealed that bladder incontinence was associated with poor health-related QOL in most of the areas investigated. It was also found that patient variables that may influence the health-related QOL of SCI patients were; neurologic levels, functional status and bladder incontinence.

This study is important in identifying how SCI patients differed on the various sub-scales of the HRQOL scale. It also highlighted the influence of SCI on the QOL of patients. Coming from Turkey however, it will be necessary to find out if these findings are replicable in the Ghanaian SCI population.

Boakye, Leigh and Skelly (2012) also conducted a systematic review with the aim of identifying frequently used measures for assessing the QOL of SCI survivors. The review showed that SCI survivors scored lower on QOL than their healthy control counterparts. Areas of QOL affected most were physiological function and performance on physical role. In three studies, the type of paralysis affected the degree of effect on physical functioning, with tetraplegics scoring lower on physical functioning than paraplegics. The effect of stage of injury and injury totality on QOL following SCI is however not clear as a result of unavailability data from longitudinal studies.

Two years earlier, Saadat and his colleagues (2010) studied health-related QOL using chronic SCI patient. The study employed 39 and 63 male veterans and non-veterans respectively. Findings showed that a longer duration following injury had a link with greater physical health-related QOL. Other factors predicting physical health-related QOL among the sample were; being a veteran and experiencing the injury in the cervical region. Factors found to be connected with healthier mental health-related domain of QOL were; older age and advanced level of education.

Even before the work of Saadat and others (2010), Leduc and Lepage (2002) assessed HRQOL among SCI patient living in Quebec (Canada). They had subjects respond to a questionnaire [the 36-item Short Form Health Survey (SF-36)]. Information about their

socio-demographic and medical history was also collected. In all 187 patients were used in the study. Results showed that there was a decline in eight domains of HRQOL. Socio-demographic and medical factors found to be significantly connected with a better HRQOL were younger age, employment and the lack of hospitalization in the preceding year. It was therefore their conclusion that HRQOL is negatively affected among SCI patients.

Murray, Asghari, Egorov, Rutkowski, Siddall, Soden and Ruff (2007) examined the effects of SCI on the lives of 63 Australian SCI survivors (physical, cognitive, emotional functioning and QOL). Participants were assessed at two points in time; immediate and after 6 months in order to observe variations as time elapse. It was revealed that participants reported a significant difference between pre- and post-morbid function (Physical, cognitive and QOL measures and on many of the emotional subscales. Further analyses revealed that post-SCI pain significantly predicted cognitive functioning, emotional functioning and QOL. Follow-up assessment showed no significant variations over the 6 months period in the various areas of functioning except reduced scores on happiness. This study is relevant in establishing that post-SCI pain (psychological distress) is important in predicting QOL of SCI sufferers.

Perry, Nicholas and Middleton (2010) also evaluated how effective a specially revised pain management programme (PMP) for groups was compared to conventional management among a clinical sample of SCI-related chronic pain. Variations were observed with time in areas such pain severity, pain catastrophizing SCI recognition, self-efficacy, mood, and interruptions as a result of pain. It was observed that at the end of the period, although the PMP sample scored more adversely on many of the variables at baseline, it demonstrated a general progress in mood and life interference compared to the group which underwent conventional care. A significant improvement was also observed in levels of anxiety and

pain catastrophizing among the PMP sample at the end of the program. However, there were no significant variations in SCI-related recognition and self-efficacy among any of the groups.

Environmental variables are also reported to impact the psychological health of SCI patients. Consequently, Whiteneck, Meade, Dijkers, Tate, Bushnik and Forchheimer (2004) sought to examine the environmental difficulties experienced by SCI patients and to find out the comparative effects of these environmental difficulties with socio-demographic and injury-related factors as well as movement restrictions in determining changes in involvement and life satisfaction among these patients. Using a cross-sectional follow-up survey design, the researchers conducted interviews between 2000 and 2002. The five ecological obstructions perceived by the participants in an order of magnitude from the most important to the least important included; the natural environment, transportation, necessity of assistance at the home, accessibility of healthcare and government policies.

Geyh et al. (2013) also examined QOL among SCI survivors in 6 countries including South Africa and USA. The other countries include Canada, Australia, Israel and Brazil. They controlled for demographic and injury-connected variables of the participants using assessment measures that were validated cross-culturally. 243 participants who suffered SCI were assessed in these 6 countries. Results from analysis revealed variations in QOL across countries. Socio-demographic variables such as shorter time since the time of injury, employment status and residence in Brazil were significant determinants of QOL. The result throws more light on the role socio-demographic and environmental factors play as far as QOL is concerned.

SCI has been found to have an influence on the QOL of relatives and care givers of patients with SCI. To this effect, Ebrahimzadeh, Shojaei, Golhasani-Keshtan, Soltani-Moghaddas, Fattahi and Mazloumi (2013) investigated the QOL and its associated variables among wives of veterans suffering chronic SCI. Data from spouses of 72 veterans known SCI survivors and 72 healthy controls were used in the study. Findings from analysis revealed that the spouses of SCI patients reported significantly lower HR-QOL compared to the control group. This result confirms other findings that suggest a negative impact of SCI on QOL, and in this case not only on the patients but the caregivers or family as well. This study however concentrated on HR-QOL, it is therefore not clear whether the result applies to general QOL of SCI patients.

Again Vall and others (2006) undertook a research which aimed at evaluating the QOL of traumatic SCI survivors in Fortaleza, Ceará, Brazil. Participating in the study were 32 paraplegic adults who suffered a complete injury; most were male, aged 20 to 47 years old and 5 to 10 years of lesion. The findings showed that the traumatic spinal cord injury patient possesses great compromising of his or her quality of life, in all four areas, mainly in the "social aspects".

One year after the work of Vall et al. (2006), Wollaars, Post, Asbeck and Brand (2007) further explored the occurrence of prolonged pain in an SCI sample and also determined the role of psychological variables on SCI pain as well as to find out how SCI pain affects QOL. Five 575 participants took part in the research. It was found out that the prevalence of SCI pain was great (77.1%). Determinants of less pain intensity among the sample were; higher ability to cope and control internal pain, a reduced amount of catastrophizing,

higher site of injury, and non-traumatic SCI. In addition, greater pain was connected with more pain-related incapacity. Less catastrophizing was also associated with enhanced health. Predictors of higher well-being were lower helplessness and catastrophizing, better SCI acceptance and less anger. On the contrary, higher helplessness, catastrophizing, and higher anger levels were linked with greater levels of depression.

Hu, Mak, Wong, Leong and Luk (2008) assessed the HR-QOL of 58 traumatic SCI patients residing in Hong Kong, using a cross-sectional ex-post facto study. Findings showed that gender, duration of injury, educational status and marital status had no significant influence on HRQOL of patients. Conversely, age and type of injury (complete and incomplete) had a significant effect on QOL of the patients. Overall, paraplegics scored lowest on QOL measures compared with individuals suffering from other diseases and healthy control group. It was thus concluded that, paraplegia has an adverse impact on QOL of patients, resulting in lowered QOL than the general population.

Likewise recently, Kivisild, Sabre, Tomberg, Ruus, Kõrv, Asser and Linnamägi (2014) conducted a cross sectional study to describe HR-QOL among patients who suffered traumatic spinal cord injury (TSCI) as well as investigate factors affecting the HR-QOL among these patients in Estonia. The study comprised of 80 individuals who suffered Traumatic SCI. Outcomes after controlling for age and gender revealed that significant factors predicting physical functioning throughout the acute stage of the injury were age and employment. In addition, age, depression as well as general anxiety significantly predicted emotional health. Age and depression were also connected with general health after controlling other variables. Consistent with the expectations of the researchers, the findings showed that the most prominent HRQOL impairment resides in physical ability.

A related study by Stensman (1994) was conducted using a longitudinal study in which 17 successively treated people who suffered a complete traumatic SCI within half a year to five years following injury were interviewed six different times. The investigator examined factors such as age at injury, social status, aetiology and level of the stage of the accident and SCI respectively as well as physical complications. During all interviews, the personal QOL was stated on a measure of 0-10 which demonstrated four main patterns during the 5 year period. It was found out that 5 of the participants reported being able to cope adequately and the QOL was almost unaffected after the injury. On the contrary, 6 of them revealed that they were coping well though there was an initial low QOL in the first years of the; 2 of the participants reported that they experienced an unsteady QOL, while 4 participants reported a persistently low QOL without any improvement. Factors found to be associated with inability to cope included serious pain, being older than 35 years at injury as well as having nothing to do with the cause of the accident.

This study clearly shows that the effect of SCI on the QOL of patients is not universal across patients. While some cope very well without any negative consequences for their QOL, others struggle at the beginning with a low QOL but later able to cope which then increases their QOL. Yet still others report a drop in QOL following the injury and their QOL remains low after several years (Stensman, 1994). It further reveals the role of personal and environmental factors in the ability to cope. However, it is noteworthy that, a person's subjective evaluation of how satisfied he or she is with the ability to cope with a condition may not reflect objective assessment of QOL.

In another study to determine the functions that are most pertinent to individuals who suffered SCI, in terms of augmenting their QOL, Anderson, (2004) conducted a study where he asked participants to rank seven factors in the order in which they thought they

were important to their QOL. The most important factors identified from the 168 responses by quadriplegics were the ability to reacquire the functions of the arm and hand, on the other hand, regaining sexual function was ranked by paraplegics as most important. Augmenting bladder and bowel utility was similarly important to the two groups. A longitudinal investigation indicated just minor differences in terms of duration after injury (i.e. between individuals who had their injury less than 3 years and those who had theirs greater than 3 years). Most of the patients reported the importance of exercise to the recovery of functions, however, more than 50% of the sample either had no access to exercise or a trained therapist to supervise the exercise.

Culture, Quality of Life and Spinal Cord Injury

Most researches conducted on culture-related issues mainly emphasize on individualism-collectivism continuum of cultures around the world (Triandis et al., 1986). Cultural differences have been observed in SCI populations as far as cognitive function and quality of life is concerned. For instance, Arango-Lasprilla (2015) reported of patients who had neurological problems also exhibiting physical, cognitive, behavioural, and/or emotional problems which required rehabilitative amenities. She also found out that less developed countries particularly lack support groups, individual psychological treatment, cognitive remediation programs, occupational and monetary support. Resources for caregivers are also scarce which negatively affects the prognosis, rehabilitation outcomes and general QOL. The above mentioned discovery suggested that ethnicity/nationality and location of the patient are influential environmental and person factors in predicting the QOL of SCI patients following SCI.

Researchers emphasize that an individual's cognitive appraisal of life is very much determined by their significant cultural principles, and these principles are passed on via

the process of socialization within one's culture (Keith, Heal & Schalock, 1996; Oishi et al., 1999). It is therefore imperative to consider cultural values when investigating issues such as QOL or life satisfaction (Krause & Dawis, 1992). That notwithstanding, culture can be a very difficult construct to define due to the varying dimensions of culture in the literature (Triandis et al., 1986). The Ghanaian culture may have certain features that may protect an SCI patient's QOL from diminishing as Africentric values has been found to act as protective factors against drug abuse and other psychological problems (Belgrave & Allison, 2006).

Psychological health, coping, psychosocial factors and SCI

There has been various debates concerning the effects suffering a SCI has on mental health and psychological well-being (Elliott & Kennedy, 2004; Middleton et al., 2007). SCI is obviously a debilitating condition which places a lot of stress on the psychological health of its sufferers. Based on the argument of stage theorists, the risk of psychopathology in SCI is minimal. They posit that any psychological distress observed is only an indispensable part of adjustment to the injury that takes part in stages (Buckelew, Frank, Elliott, Chaney & Hewett, 1991; Elliott & Kennedy, 2004). However, some studies have also argued that SCI is linked with elevated threats to the psychological health of patients and therefore ought not to be treated as a "usual" response to the process of adjustment (Elliott & Kennedy, 2004; North, 1999).

Much attention has been given to investigations concerning the essential variables necessary for the successful adjustment or coping with traumatic SCI over the years (Vash & Crewe, 2003). In general, investigations discover several predictors of successful adaptation including actual and perceived social support, socioeconomic status, affect,

employment, education and quality of life (Anderson et al., 2007; Anderson & Vogel, 2002; Dijkers, 1997; Noreau & Shephard, 1995; Herrick, Elliott, & Crow, 1994; Krause & Anson, 1996; 1997; Krause, Terza, & Dismuke, 2008). In order to provide the necessary counselling services to SCI survivors, such variables must be considered because such factors may give an indication of potential threats to mental health following SCI.

For instance, Galvin and Godfrey (2001) indicated that thirty to forty percent of SCI survivors suffer from clinical depression after the injury, while twenty to twenty-five percent of patients suffer an anxiety disorder which is still present 2 years later. In a similar vein, Kennedy, Duff, Evans, and Beedie (2003) pointed to the high proportions of depression and suicide among SCI patients; as high as 2 to 6 times more, compared to individuals with no disability.

Griffiths and Kennedy (2012) however pointed out that, investigation into the psychological effect of SCI is primarily dedicated to reports of psychological distress, in spite of the low prevalence rates of psychopathology. In the meantime some individuals have been found not to report psychological distress. Appraisal of the condition has been suggested as a possible mediator of psychological outcome. Griffiths and Kennedy (2012) therefore sought to offer an account of the experiences of positive psychological results among individuals who report lower psychological distress following injury. They interviewed 2 female and 4 male (i.e. 6 participants) who reported lower psychological distress through semi-structured interview schedules. Using interpretative phenomenological analysis they found out that positive psychological outcomes did not imply that participants did not experience psychological difficulty but the ability to overcome the difficulty was the key. Factors identified by the participants to be crucial for

positive psychological outcome were; challenge-focused appraisals, social support, and taking part in meaningful activity. This finding signifies that SCI in itself may pose psychological difficulty but the ultimate psychological outcomes depend on ability of patients to surmount these difficulties. This means that SCI may have varying impact on the psychological health of different people.

To assess psychosocial effects of SCI on patients, Anderson, Vogel, Chlan, Betz and McDonald (2007) conducted a study in which they did a telephone interview to assess depression among 232 adults, aged 25 years and above who had SCI as children (at the age of 18 or below). Results revealed that 27 % of participants stated symptoms of depression which ranged from minor to severe; 7% experienced suicide ideation during the past 2 weeks; while 3% described symptoms which qualify for the diagnosis of major depressive disorder. Consistent with the conclusions of the authors, depression is a major psychological challenge among adults SCI patients with paediatric-onset. The researchers also revealed that depression is connected to poorer outcomes of the condition and lower QOL.

It has also been reported that SCI affects emotions, coping strategies and post-traumatic psychological growth. To examine this assertion, Pollard and Kennedy (2007) assessed 87 traumatic SCI survivors after 12 weeks of injury. 10 years later, they conducted a follow up study assessing areas such as depression, anxiety, coping, functional dependence and social support. Findings revealed that levels of anxiety and depression had fluctuated a bit across the 10-year period. Surprisingly, about 67% of the participants reported no depressive symptoms, coping strategies also continued to be relatively steady at the end of the 10 year period. This suggests that many SCI patients cope well with the consequences

of their disability devoid of major negative psychological outcomes. What remain crucial however, is the coping mechanisms employed in the adjustment process.

It has been reported that specific coping skills and psychological adjustment procedures are used following the development of SCI. In consequence thereof, researchers Buckelew, Baumstark, Frank and Hewett (1990) investigated specific coping strategies associated with psychological adaptation after SCI with a battery of assessments administered to 57 patients participating in SCI rehabilitation program. Participants were distributed into three sets depending on degree of psychological distress. Expressing emotions and blaming oneself were reported to be used more by high distress participants. They also reported using coping strategies such as treat minimization and wish-fulfilling fantasy relative to the groups with low and moderate distress. The Self-Blame Coping strategy was significantly correlated with psychological distress more than factors like duration after injury, age or level of injury.

Almost a decade later, Kennedy, Matthew, Evans and Sandhu (2008) examined the extent to which current thought processes, regarding assessments and optimism are related to utility of coping mechanisms and psychological adaptation to SCI in a cross-sectional study in which they used 54 new cases of SCI. Results revealed that primary assessment of danger and optimism had significant association with the coping mechanism of “fighting spirit”. Optimism was also found to be a superior determinant of coping than assessment. Assessment was discovered as the most eminent determinant of psychological adaptation among these SCI patients. This study emphasized the significant part cognitive assessment coping plays in adjustment to SCI. The study is however criticised for the long interval (10

years) after which the post test was conducted. It is possible that, variables such as experience and other demand characteristics may have occurred during this period.

Murray et al. (2007) investigated how spinal cord injury affects the QOL, emotional function and physical and cognitive abilities from the patients' point of view in which sixty-three SCI survivors were assessed on their personal evaluation of functioning pre and post injury in the physical and emotional domains as well as emotional domain and QOL and a follow-up assessment conducted 6 months after the first assessment in order to ascertain changes over time. Findings showed a that a significant change existed between perceived functioning before and after injury on total physical, cognitive and QOL scores and also on numerous subscales of the emotional functioning measure. Further analyses showed that after-SCI pain proved to be a prominent determinant of cognitive, emotional and QOL functioning. No changes were apparent at a 6 months follow-up period, except a decline in happiness level. These results suggest that SCI patients perceive reduced physical and cognitive functioning as well as QOL the SCI. Also, certain areas of emotional functioning may be affected negatively.

Craig, Tran, Lovas and Middleton (2008) explored the degree of negative psychological states among 33 SCI patients living in a community in comparison to 33 healthy controls, who were matched on age and sex. Results showed that the SCI group scored higher on psychopathology. Alarming, 20% of these patients had elevated levels of psychopathology characteristic of people diagnosed with a mental illness. This further emphasizes the influence of SCI on psychological wellbeing of patients, which calls for urgent attention in this area.

Research suggests that not all studies support the stage theory of adjustment following SCI. For example, to better appreciate adaptation after SCI, one hundred and six samples from two populations were assessed using the SCL-90-R, a symptom checklist, and the Multidimensional Health Locus of Control scales. The first set of participants were on rehabilitation between 1981 to 1982 and second set of participants were admitted for the period of 1984-1986. The second set of participants entered rehabilitation programs more rapidly after injury and reported more anxiety, phobic anxiety, and hostility compared to the first sample subjects. Within each group, there was no evidence for a association between age, duration of injury and health beliefs or psychological pain. In conclusion, therefore the research did not confirm stage theory for adjustment after traumatic injury.

Summary of the Chapter

This chapter examined the theoretical underpinnings of the present study. The first theoretical framework discussed was executive function theory which posits that SCI may cause either direct damage to parts of the frontal lobe, essential for executive functions, which in turn causes impairments in executive functions or lead to damage of neural networks in the frontal lobe and other structures due to diffused axonal injury which also spells doom to executive functions in particular. It was however argued that considering the nature of SCI and its effects on distributed neural network in the brain, impairments may not only be seen in executive functions but more so in other cognitive functions of the frontal lobe and related structures which need to be investigated.

Secondly psychological adjustment theories were reviewed which include the “stages theory” and the “developmental theory”. The stages theory argued that SCI patients go through certain psychological stages in adjusting to the condition, similar to what individuals going through other kinds of loss and grief go through. These stages depending

on their management may determine the psychological outcome of the patient. It was also pointed out that the great impact of individual differences is a great weakness to the theory. The developmental theory on the other hand argues that SCI results in regression in terms of psychosocial development of the patient to the stages of infancy and childhood. Psychological tasks that were already mastered have to be reworked to the stage where the patient regains independence, this poses a challenge to the psychological health of patients. The third theory reviewed in this chapter was the integrative theory of QOL which incorporates three types of QOL into one framework; subjective, objective and existential. According to this theory, QOL is not only based on the individual's perception of how happy or satisfied they are with their life but also their ability to adapt well into their cultural norms and values as well as meet certain observable standards of living. This theory in essence emphasizes the importance of cultural and environmental factors in defining QOL of SCI patients.

The chapter further reviews related studies in the areas of cognitive functioning, psychological health and quality of life of SCI patients including the influence of African cultural values on the QOL of SCI patients. Several of these studies revealed that cognitive functioning, psychological health and QOL of patients may be compromised as result of SCI, though the areas of dysfunction varied across studies.

Rationale/Justification for the Study

The general justification for the present research is to examine the topic from the cognitive and Ghanaian perspectives. Most studies conducted among SCI patients recruited with a shorter age range (Klass, 2013; Kelly, Mulcahey & Vogel, 2012). Studies abound on depression, psychological factors and cognitive deficits among paediatrics and the youth

(Klass, 2013; Osorio, Reyes & Nasagh, 2014). This study examined the cognitive deficits among SCI patients aged from 18 to 79 to access the variability within the age range.

In addition, most of the studies, were either medically or biologically based with little or no attention paid to cognitive factors (Kreuter et al., 2005). This study thus focused primarily on the cognitive factors that are influential in the life of persons with SCI. Most of these studies were also conducted in Western countries.

Moreover, prevalence of depression was projected to lie between 20-43% among SCI patients at the time of attending rehabilitation at an inpatient facility. An additional risk of reporting symptoms of depression and anxiety following release from rehabilitation is projected to be between 15% to 50-60% (Bombardier, Richards, Krause, Tulsky, & Tate, 2004; Kennedy & Rogers, 2000). Studies also postulated that the dangers of adverse psychological conditions are great except SCI patients are given efficacious intervention such as cognitive behavioural therapy as part of the rehabilitation program (Kennedy & Rogers, 2000). It is unknown if these findings are still valid today and in the Ghanaian SCI population. It is therefore necessary to investigate the replicability of previous findings among a Ghanaian SCI sample.

Further, cultural values and practices have been found to influence rehabilitation, coping and the overall wellbeing in SCI patients. Thus Reece (2007) posited that contextual (cultural and environmental) factors have critical impacts on health, rehabilitation and recovery. Recovery and QOL is culture laden (WHO, 2013). It is imperative to find out how adherence to Africentric values influence recovery and general QOL of SCI patients in Ghana.

Also, most studies reviewed examined the QOL and psychological health among SCI patients independently (Kennedy, Duff, Evans & Beedie, 2003). It is necessary to examine how the variable come together to influence QOL of SCI patients in Ghana. In this study, cognitive, psychological, social and cultural factors are examined together.

A thorough review of available literature revealed that similar study has not been conducted on any Ghanaian sample; and very little literature exist on samples from the developing world. This study is the first of its kind on a Ghanaian sample. As emphasised by Kreuter et al, (2005), even though life expectancy is gradually improving due to the establishment of ultramodern spinal care department, the improved survival rate is accompanied by secondary complications which impede the ability to live an independent life. It is estimated that, more than 80% of the global populace live in developing countries (Soubotina, 2000), however very little is known regarding psychosocial issues surrounding SCI in this developing countries such as Ghana. This may be due to several factors including resource limitations, focussing on curable illnesses compared to incurable conditions such as SCI, and the indifference among members of the medical fraternity to tackle a protracted and a relatively life-long disability (Rathore, 2010). Rathore (2010) for instances points that SCI was branded as, "an ailment not to be treated" some five hundred decades ago (Feldman & Goodrich 1999) [P.1]. Regrettably so much remains unchanged today in many developing countries such as Ghana concerning attitudes towards relatively chronic conditions such as SCI.

Statement of Hypotheses

The following hypotheses were tested based on the literature reviewed:

1. Healthy controls will obtain significantly higher scores on cognitive functioning tests than SCI patients

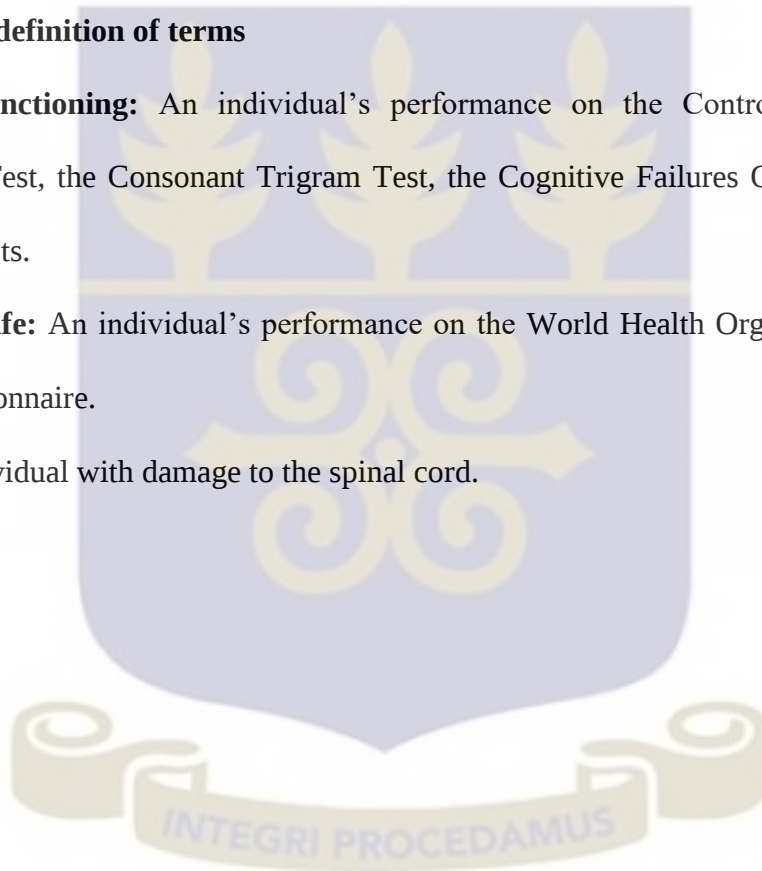
2. The general quality of life of healthy controls will be significantly higher than those of persons with SCI.
3. A significant positive relationship will exist between Africentric values and QOL among SCI patients.
4. Healthy controls will report significantly lower psychological distress (Global Severity Index) than persons with SCI.

Operational definition of terms

Cognitive functioning: An individual's performance on the Controlled Oral Word Association Test, the Consonant Trigram Test, the Cognitive Failures Questionnaire and Digit Span tests.

Quality of Life: An individual's performance on the World Health Organization Quality of Life questionnaire.

SCI: An individual with damage to the spinal cord.



Proposed Conceptual Framework

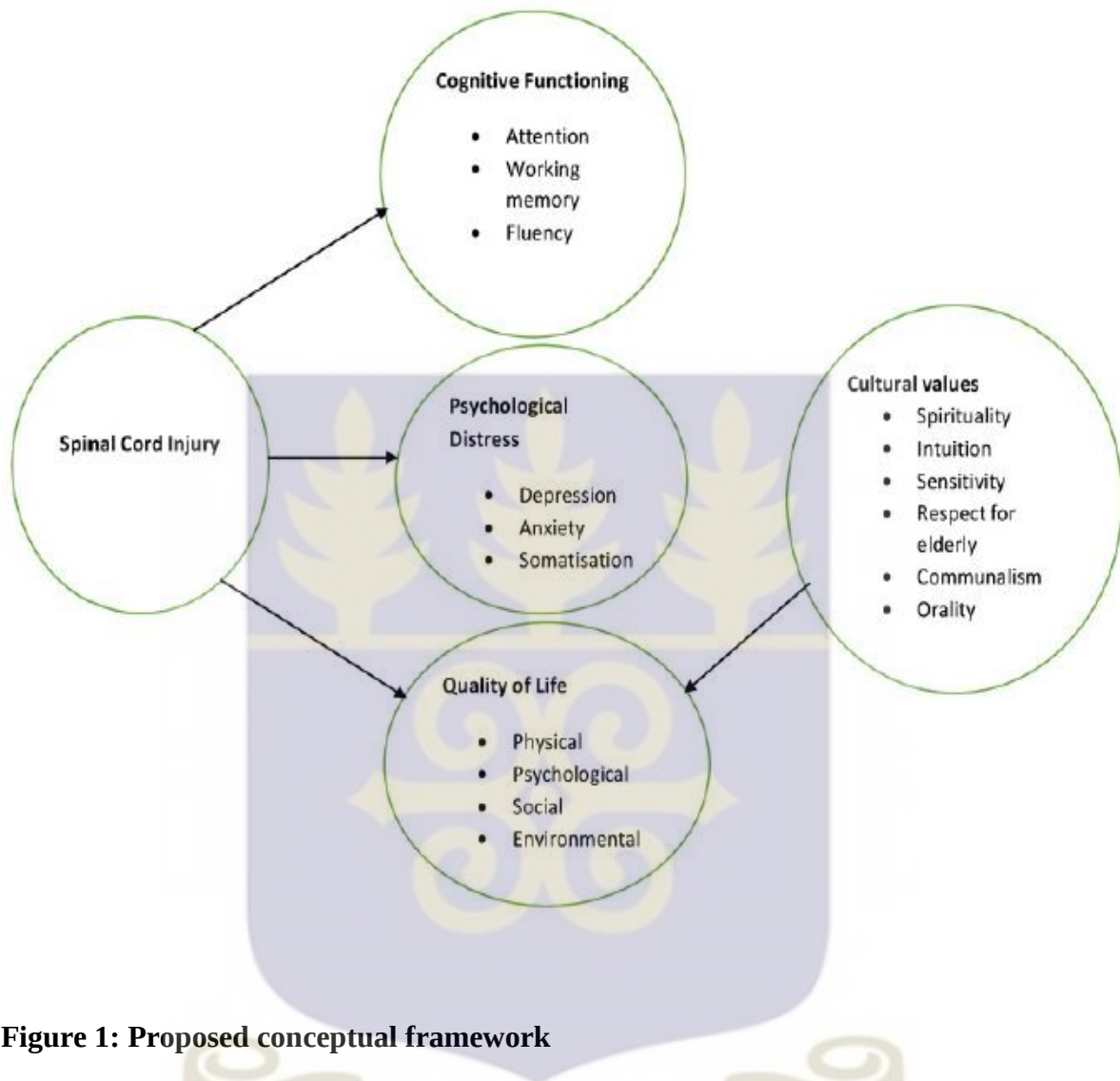


Figure 1: Proposed conceptual framework

Figure 1 shows the proposed conceptual framework of hypothesized relationships among variables. As shown in the diagram, it is predicted that SCI will have a significant effect on cognitive functioning, psychological health and quality of life. Again, cultural values is predicted to influence quality of life significantly.

CHAPTER THREE

METHODOLOGY

The chapter three of the present study presents the methodological procedures employed in the research. The design used for the study, the population, sample size determination and sampling procedure, the detailed description of the measuring instruments, the description of participants and procedure are covered in this chapter.

Population

The population for the study was all SCI patients in Accra. As there was no accurate record of all SCI individuals, the exact size of the population could not be determined. Participants predominantly were drawn from the Korle-Bu Teaching Hospital (KBTH) and 37 Military Hospital. Apart from these settings, the researcher visited some participants in their homes. The KBTH and 37 Military Hospitals were used because these are the major referral centres for SCI cases and patients cover diverse socio-economic backgrounds.

Healthy controls were also recruited from the population of caregivers of SCI patients and other patients attending the above mentioned health facilities for treatment of less serious medical conditions such as malaria, for the purposes of comparison. These groups of healthy controls were selected because it is assumed that they are equally going through some level of stressful life event (even though their experiences may be different) and also have similar socio-demographic characteristics as the SCI group, in order not to have a healthy control group being too different from the SCI group.

Sample size Determination

The researcher obtained a total sample of 90 which consists of 45 SCI patients and 45 healthy control individuals for the study. The Epi-infoTM sample size calculation for unmatched Case-Control Studies was used to determine the sample size for this study (Centre for Disease Control and Prevention, 2012). A sample size of eighty-eight (88) was derived, 44 each for clinical sample and control sample using a significant level of .05 and 80% effect size.

Sampling Technique

The purposive and snowball procedure were used to recruit the SCI patients into the study, and convenience sampling procedure was used for the healthy controls. The purposive sampling procedure was and the snowball procedures were used for the SCI patients because of their unique and peculiar health status. The healthy controls were included to enable meaningful conclusions to be drawn from the results. Participants predominantly were drawn from the Korle-Bu Teaching Hospital (KBTH) and 37 Military Hospital. Apart from these settings, the researcher visited some participants in their homes.

Participants

Participants included SCI patients and healthy controls. Participants were also required to have basic understanding of the English language (at least spoken English). This was to facilitate validity and reliability of the data and also to avoid any problem of mistranslation; as the sampling instruments were in English. Participants were also persons who were established not to have had any co-morbid condition. In terms of age, participants were 18 to 70 years of age.

Inclusion and exclusion conditions for both groups are described below:

SCI patients

Inclusion criteria:

- The participant must have been diagnosed of SCI
- Undergoing medical treatment at KBTH or 37 Military hospital
- Should have understanding of test item and be capable of responding to them

Exclusion criteria:

- history of cognitive conditions such as dementia, any other central nervous disease apart from SCI
- history of drug or alcohol dependence

Healthy control group

Inclusion Criteria:

- Not diagnosed with SCI.
- Should be able to read and write.

Exclusion Criteria:

- Had a history of cognitive conditions like dementia, central nervous system disease, and unstable medical illness.
- Had a history of drug or alcohol dependence.

Demographic data of participants

The mean age for the total sample (90) was 38.98(SD=13.94). With members in the SCI group, the mean age was 41.24(SD=14.66) and for the healthy control, the mean age was 36.71(SD=12.95). Table 3.1 represents the summary of the demographic characteristics of participants used in this study.

Table 3.1: Summary of Demographic characteristics of the entire sample (N=90) SCI patients and healthy controls

Variable	SCI Patients n =45 (%)	Healthy controls n =45 (%)
Gender		
Male	19 (42.2)	20(44.4)
Female	26 (57.8)	25 (55.6)
Age		
Mean (SD) in years	41.24 (14.66)	36.40(13.94)
Marital status		
Married	32(71.1)	13(28.9)
Single	9 (20.0)	21(46.7)
Cohabiting	n/a	8(17.8)
Divorced/Widowed	4(8.9)	3(6.7)
Level of education		
Basic school	20(44.4)	10(22.2)
Secondary school	10(22.2)	21(46.7)
Tertiary	15(33.3)	14(31.1)
Religion		
Christian	38(84.4)	45(100.0)
Muslim	7(15.6)	n/a
Duration of diagnosis		
Less than a year	19(42.2)	n/a
1-5years	13(28.8)	
6-10years	10(22.2)	
Above 10years	3(6.7)	

Research Design

The current research used the case-control survey design. This design involves establishing relationship among variables as well as comparing groups that are already existing. The survey design was deemed appropriate because the researcher sought to employ

questionnaire and other survey inventories and psychological tests to determine the QOL and cognitive functioning of patients with SCI in Ghana by comparing them with healthy controls who do not have SCI, as well as determine if cultural (Africentric values) factors predict the QOL of patients with SCI.

Materials/Instruments

There were four main variables in the study. These were Quality of Life, Cognitive Functioning, Psychological Distress, and Africentricism (Culture). Various measures were used to measure these variables. Assessment of QOL was via the World Health Organization Quality of Life Assessment-BREF (WHOQOL-BREF); Culture was assessed using the Africentric Worldview Scale; Psychological Distress was also assessed using the Brief Symptom Inventory (BSI) and finally, Cognitive Functioning was measured with four different scales: Digit Span, Controlled Oral Word Association Test (COWAT), Consonant Triagram Test (CTT), and Cognitive Failure Questionnaire.

These measures were chosen because of their conceptual appropriateness with the study variables, extensive usage and good reported psychometric properties. The various measures are described below:

Demographic measures

Demographic data and injury-related information of the respondents were collected from their medical records and clinical interview report/folder.

Measurement of Quality of Life (QOL)

The World Health Organization Quality of Life Assessment-BREF (WHOQOL-BREF) by the WHOQOL Group (1998) was used to assess the QOL of the respondents. This scale

has twenty-six items which cover total QOL, contentment with health, activity of day-to-day living, living conditions and relationships. This scale was precisely designed for use cross-culturally. Previous studies using this scale paralleled the psychometric properties of several other QOL scales among SCI patients in 6 different countries and established the 5 designated items on the WHOQOL as the most valid instrument cross-culturally (Geyh, Fellinghauer, Kirchberger & Post, 2010). The scale has a Pearson reliability index of 0.78 which is acceptable. In addition, the response sets of the scale were arranged and no cross-nation bias was established using differential item by item analyses. Responses on the QOL scale were scored on a 5- point Likert scale; 1 (very dissatisfied) to 5 (very satisfied). Three items are reverse scored: items 3, 4, and 26. These ones must first be reversed before doing the analysis, such that a response of 5 becomes 1, 4 becomes 2, and 5 becomes 1. The responses across each domain are then added to obtain the raw scores. The next step involved transforming each raw scale score into a transformed score. The transformation is done by using the formula proposed by the developers (WHOQOL Group, 1998):

$$\text{Transformed Score} = \left[\frac{(\text{Actual raw score} - \text{Lowest possible raw score})}{\text{Possible raw score range}} \right] \times 100$$

where “Actual raw score” was the values achieved by adding all the items in a given domain, “smallest possible raw score” was the lowest possible value that could occur through the addition (i.e. 1 multiplied by number of items in a given domain), and “Possible raw score range” was the difference between the maximum possible raw score and the smallest possible raw score. The maximum raw score possible is arrived at by multiplying the total items in a given subscale by the highest score on the scale, 5. For

instance, the lowest possible raw score of the *physical health domain* is $(1 \times 7) = 7$; and the maximum possible raw score on the same scale is $(5 \times 7) = 35$.

The likely raw score ranges for each domain is computed by deducting the least possible raw score from the maximum possible raw score. Accordingly, the possible raw score ranges of the various domains were as follows: *Physical Health*=28 (i.e. 35-7), *Psychological* = 24 (i.e. 30-6), *Social Relationships* =12 (i.e. 15 – 3), and *Environment* = 32 (i.e. 40 – 8). The transformed scores were used for the final analyses.

The composite scale as well as the subscales (domains) all showed very strong reliability coefficient. The following are the Cronbach's alphas obtained for each of them in the current study: Physical health = .79; Psychological health = .62; social relationships = .62; and Environment = .66

Cognitive functioning measures

A group of tests were used to measure cognitive function among participants. This was primarily informed by the fact that cognitive function comprises of more than one domain. Research (Dowler et al., 2005; Roth et al., 2009) suggests that the most common areas of concentration when measuring cognitive functioning are those of attention, memory and sometimes psychological deficits. Thus in the instant case, this study focussed on the attention, memory and psychological deficits in participants. In line with the above statement, a total of four tests/scales were used.

Digit Span tests (a subtest of the WAIS-IV) [Wechsler, 2008]

The digit span test is a working memory subtest of the Wechsler Adult Intelligence Scale (WAIS). Its tasks are exercise of verbal working memory, and consist of Forward Digit

Span (FDS) and Backward Digit Span (BDS) tasks (Craik, 1977). The BDS and FDS are similar, except that respondents are required to repeat the digits in a backward order from which they were initially. Because the BDS entails the respondent concurrently storing the digits while manipulating them in memory in a backward the order, it is usually regarded as a measure of working memory capacity (Dowler et al., 1995). The Digit Span Tests (both FDS and BDS) are scored based on the number of numbers the participant is able to recall correctly. In other words the total number of correctly recalled numbers a participant reported becomes the score of the participant. The average split-half reliability coefficient across all age groups for the Digit Span was .90, with an average Standard Error of Measurement of .94. Test-retest reliability coefficient (14-84 days, M=34.6 days) averaged over age groups was .83. Digit Span has the highest specificity of all WAIS-IV subtests (Groth-Marnat & Baker, 2003).

Controlled Oral Word Association Test (COWAT) [Espe-Pfeifer & Wachsler-Felder, 2000]

The Controlled Oral Word Association Test was also used in the current study as part of the measures of cognitive function. It is a verbal fluency measure which assesses spontaneous articulation of words that belong to the same word class or begin with selected alphabets (Espe-Pfeifer & Wachsler-Felder, 2000). COWAT is suitable for both paediatric and adult populations.

According to Sherer (2014), the COWAT assesses verbal initiation and fluency by instructing the patient to name as many words as possible within a time frame. The COWAT requires the testee to say many words beginning with the letter “F” as he/she can within 60 seconds: then words beginning with “A”, then “S”. These letters were selected by how frequently they appear in the English Language (Semrud-Clikeman & Ellison,

2009). This test is sensitive to brain dysfunction in adults, particularly in the left frontal region, followed by the right frontal area (Lezak, 1994). In its administration, the respondent is typically required to name words beginning with a selected letter, without proper nouns within a minute. The examiner quickly writes down the words mentioned by the respondent on a piece of paper. In addition, the tester watched out for preservative errors. On the average, the administration takes 5–10 minutes. Scoring is done by adding all the correct answers of the testee. Test –retest reliability coefficient for the COWAT is reported to be .6 (Ross, 2007).

Consonant Trigram Test (CTT) [Peterson & Peterson, 1959]

In addition to the above, the present study made use of the Consonant Trigram Test. The Consonant Trigrams Test (CTT) required participants listening to a series of 3 letters followed by a figure. The participant is required to keep the letters in working memory while concurrently deducting the 3 from the figure (example; “88 85 82) for the period of an interruption, then made to recite the letter series. Tasks on this test obviously entail dividing attention between two simultaneous activities. It is also dependent on working memory. The test is sufficiently sensitive to identify even subtle deficits, as established in a study of patients who recovered well from closed head injuries (Stuss et al., 1985). However, previous investigations did not examine whether scores on the CTT was related to real world behavior among clinical samples, especially activities that depend greatly on working memory and divided attention. CTT is scored by adding up the total number of correct responses/recalls made by the participant. The sum total of the correct responses by participants then formed their final scores which was used in the analyses. The CTT is reported to have a reliability coefficient of .71 (Mertens, Gagnon, Coulombe & Messier, 2006).

Cognitive Failures Questionnaire (CFQ) [Broadbent, Cooper, Fitzgerald & Parkes, 1982]

Finally, the present research also used the Cognitive Failures Questionnaire (CFQ). The CFQ consists of 25 items self-report questionnaire which aimed at identifying everyday memory failures. An item on the questionnaire is; “Do you notice you forget why you went from one part of the house to the other?” It assesses cognitive and executive functioning such as lapses in perceptual ability, memory, and motor ability required to complete everyday responsibilities in the last 6 months (Rast, Zimprich, Van Boxtel & Jones, 2009). Respondents were expected to state the degree to which the questions in the CFQ apply to them, on a scale of “Never” (0) to “Very often” (4). Thus a participant’s score on the questionnaire is the average rating divided by the 25 responses. Specifically, the responses with their corresponding numerical weights are: 0 – Never, 1 – Very rarely, 2 – Occasionally, 3 – Quite often, 4 – Very often

The test-retest reliability of the summated CFQ score was found to be 0.71 (Bridgers, Johnsen & Brasher, 2013).

Measurement of Culture

Africentric Worldview Scale (AWS) [Belgrave & Allison, 2006; Belgrave et al., 1997]

The Africentric Worldview Scale for measuring Africentric beliefs developed by Belgrave et al. (1997) was used. It assesses cultural values and beliefs from the African perspective. It was initially designed to assess this construct among African Americans. It consists of six (6) subscales, specifically:

1. Spirituality: items include “Attending churches, mosques, or other places of worship are important to me”, “I meditate and engage in other acts of faith” etc.,
2. Intuition: example of item is, “I listen to my inner voice”
3. Sensitivity: items include, “I feel that sometimes I do things just because it feels right”, “I can tell when a close friend is in trouble or feels bad” etc.
4. Respect for Elders: “It is expected that the elderly will be cared for by younger generations”
5. Communalism: “The ultimate value of a person is in his/her service to others”
6. Orality: “I perform better on oral rather than written tasks”

The scale has a good reported reliability with a Cronbach alpha of 0.75. Total score on this scale was obtained by adding up all items. Greater scores on the scale signifies higher levels of Africentric worldview, and vice versa. Scores range from 23 to 115, with scores below 46 suggesting low level of Afrocentric belief. The reliability coefficients obtained for this study for the Afrocentric Worldview was .71. The Cronbach alphas recorded for the subscales are as follows: Spirituality =.69, Intuition =.70, Sensitivity =.74 Respect=.71, Communalism =.73, Orality =.72. The response rate on the scale is on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Measurement of Psychological Distress

Brief Symptom Inventory (BSI-18) [Derogatis, 2000]

In measuring psychological distress, the 18-item Brief Symptom Inventory (BSI-18) by Derogatis (2000) was used because of the peculiar nature of the research sample. The BSI-18 is a short form of the 53-item BSI (Derogatis, 1993), which was also an abridged form of the Symptom Checklist-90-Revised (Derogatis, 1994). The BSI-18 a short screening

tool to screen for symptoms of depression, anxiety, and somatization (Derogatis, 2000). The 3 dimensions consist of 6 items each. It is a self-report measure consisting of statements that participants respond to, depending on their level of distress over the past one week. Reported internal consistency estimates were within acceptable range (.74 for somatization, .79 for anxiety, .84 for depression, and .89 for the total Global Severity Index). Concomitant validity with the SCL-90-R ranges from .91 to .96 on both domain-specific and total scores.

A Global Severity Index (GSI) of distress is finally computed for the entire BSI-18. The GSI constitutes the sum of the three subscales. The overall GSI score ranges from 0 to 72 with higher scores suggesting greater levels of psychological distress (Derogatis, 2000).

Procedure

The researcher obtained ethical approval from the Ethics Committee for Humanities (ECH) of the Institute for Statistical, Social and Economic Research (ISSER), University of Ghana, other necessary approvals from the various Heads of Departments concerned in order to carry out this study.

Two weeks preceding the actual data collection, a pilot survey was done to test the reliability and suitability of items on the selected instruments. The pilot study was conducted at the 37 Military Hospital. Twenty participants (10 healthy controls and 10 SCI patients) were conveniently selected by the researcher to participate in the pilot study. Written consent was obtained from them and all but three participants consented. Two participants withdrew from taking part in the research for personal reasons and 3 participants could not complete the tests. This represented an attrition rate of 25%. A final sample of 15 (consisting of 11 females and 5 males) thus participated in the pilot study.

The researcher then visited the research settings on appointed dates to meet participants for the actual data collection for the research. Participants were required to read and append their signatures to a consent form, indicating their comprehension of the research and readiness to take part before the research instruments were administered to them. The instruments were largely administered by the researcher, except in cases where participants were capable of self-administration. As mentioned earlier, the researcher in some instances visited the participants in their homes to collect data. For those who could not write as a result of their SCI condition, the researcher read out the questions to them and recorded their responses to the items on the sampling instruments. Data collection was paced according to the capacity of patients so as not to put too much strain on them. The privacy of participants' information was also ensured as the questionnaires did not contain names or identifying information. All data collected were analysed as a group data and used only for the purposes of this research. Only patients who were willing were used for the study and participants were free to terminate the study at any time they wanted to.



CHAPTER FOUR

RESULTS

Introduction

Data analysis was performed using SPSS 18. The chapter is made up of two main sections, the first being preliminary analyses section and the second section is the testing of hypotheses of the study using appropriate statistical techniques.

Preliminary analyses were conducted to summarize the data. These included analysis of normal distribution of the variables, and descriptive analysis of key study variables. Parametric tests (Independent *t* test, Multiple Analysis of Variance and Pearson Correlation) were mainly employed for the analyses of the data.

Preliminary Analyses

Preliminary analysis was done to examine the distribution of the data using means, standard deviation, skewness, kurtosis and reliability coefficient of the key study variables. This is presented in Table 4.1

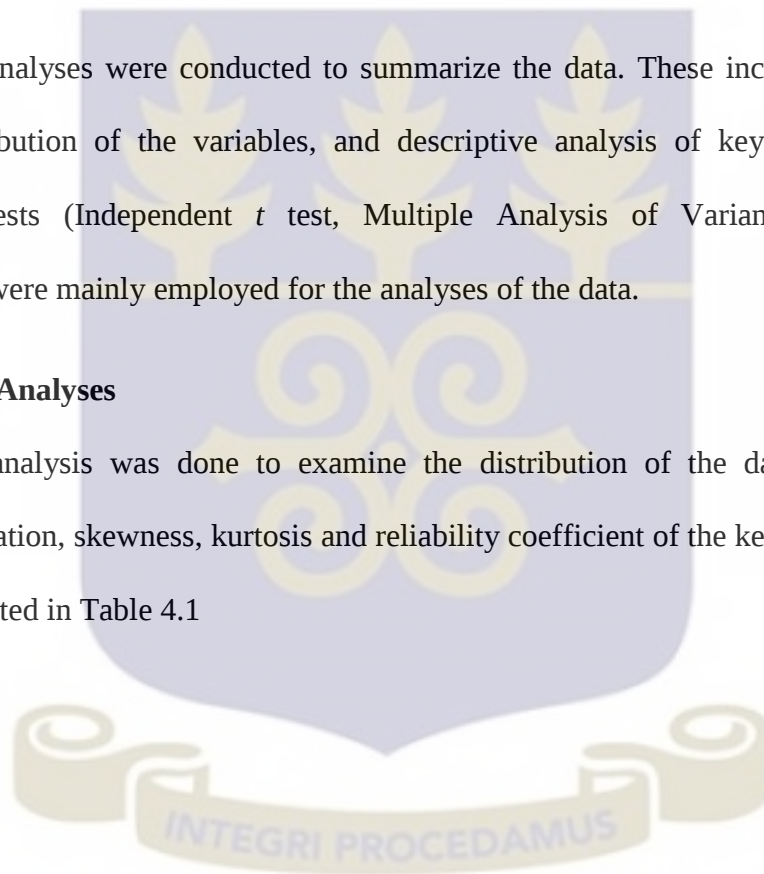


Table 4.1: Means, SD, Skewness, Kurtosis and Alpha Reliabilities of key study variables

VARIABLES	Mean	SD	Skewness	Kurtosis	Cronbach α	Min.	Max.
Global Severity Index	1.17	.76	1.14	.36	.84	0	3
Depression	1.10	.74	.75	.25	.70	0	3
Anxiety	1.04	.74	1.47	1.63	.74	0	3
Somatization	1.01	.62	.92	-.04	.62	0	3
Digit span tasks	14.74	3.96	-.03	-.53		7	25
COWAT	25.84	10.19	.81	1.86		6	61
Const. Trigram Test (CTT)	7.89	2.25	-.12	-1.33		4	11
Cognitive Failures	47.73	12.70	.65	-.09	.89	14	73
Africentric values	63.67	5.94	.25	-.36	.63	40	61
Quality of life (QOL)	13.12	6.81	-.30	-.95	.74	0	25

Table 4.1 indicates descriptive statistics of the sample. From Table 2 it can be seen that the data was evenly distributed. For a normal distribution of data, Kurtosis must range between -2 to +2. It can further be seen that, the data from scores on the Consonant Trigram Test and Digit Span Tasks is positively skewed. This means that participants generally performed poorly on the tests administered.

Hypotheses Testing

For the analyses of stated hypotheses, Multivariate Analysis of Variance (MANOVA) was used to establish the difference between SCI participants and the Healthy Control Group on Consonant Trigram Test, COWAT, Digit Span, Cognitive Failures Questionnaire and

Brief Symptom Inventory (BSI) (i.e. overall distress and distress subscales) for hypotheses one and four. One of the assumptions for using MANOVA is that the dependent variables are related in some way. For this reason, two different MANOVAs were conducted on the cognitive functioning tests on one hand, and the psychological distress factors on the other. For hypothesis two, One-Way ANOVA was done to establish differences among the three clusters on general and domain specific quality of life. Finally, Pearson Product-Moment Correlation Co-efficient was employed to establish the direction and strength of relationship between QOL and culture (Africentric values).

Hypothesis 1

Hypothesis 1 stated that Healthy controls will obtain significantly higher scores on cognitive functioning tests than SCI patients. To test this hypothesis, the one-way Multivariate Analysis of Variance (MANOVA) was used to assess the effect of type of condition on cognitive functioning tests. The covariance and homogeneity assumptions underlying the MANOVA were not violated, Box's (M= 13.56, $p=.23$), Wilks Lambda [$F(4, 85) = 24.17, \rho = .000$], Wilks' Lambda ($\lambda = .47$) was observed. The result of the MANOVA is summarised in Table 4.2

Table 4.2: Summary Table of the MANOVA Comparing Cognitive Functioning between Healthy Controls and SCI Patients

Variables	SCI (n=45)	Healthy (n=45)	F	Df	ρ
	Mean (SD)	Mean (SD)			
CTT	6.40 (1.45)	9.38 (1.87)	70.40	1, 89	.000
COWAT	21.73(8.94)	29.96 (9.77)	17.35		.000
Digit Span	13.76(3.43)	15.73 (4.23)	5.93		.017
CFQ	51.71 (13.10)	43.76 (11.05)	9.69		.002

Note: CTT= Consonant Trigram Test, COWAT= Controlled Oral Word Association Test, CFQ= Cognitive Failures Questionnaire

From Tables 4.2 above, a significant difference existed between the SCI and healthy control groups on all the components of cognitive functioning; CTT [$F_{(1, 89)} = 70.40, \rho = .000$], COWAT [$F_{(1, 89)} = 17.35, \rho = .000$], Digit Span [$F_{(1, 89)} = 5.93, \rho = .017$], and CFQ [$F_{(1, 89)} = 16.65, \rho = .000$]. In effect, the SCI patients performed poorer on CTT, COWAT and digit span but reported a higher scores cognitive failures than the healthy control group respectively; CTT [(M = 6.40) < (M = 9.38)], COWAT [(M = 21.73) < (M = 29.96)], digit span [(M = 13.76) < (M = 15.73)] and Cognitive Failures [(M = 51.71) > (M = 43.76)]. Therefore, the hypothesis as stated that patients with SCI are likely to perform poorly on the cognitive functioning tests compared with that of the healthy controls was supported.

Hypothesis 2

This hypothesis states that the general quality of life of healthy controls will be significantly higher than those of patients with SCI.

This hypothesis was tested using the Independent *t*-test. Findings are summarized in Table 4.3 below;

Table 1.3: Summary of independent t-test analysis of differences in QOL between Healthy Controls and Spinal Cord Injury Patients

Variables	HEALTHY (n=45)	SCI (n=45)	<i>t</i>	<i>Df</i>	<i>p</i>
	Mean (SD)	Mean (SD)			
QOL	16.82 (SD=5.73)	9.42 (SD= 5.73)	6.12	88	.000
PHYSICAL QOL	61.67 (SD=8.32)	52.94 (SD=9.33)	4.68	88	.000
PSYCHOLOGICAL QOL	61.57 (SD=8.61)	52.87 (SD=14.81)	3.41	88	.001
SOCIAL QOL	65.19(SD=13.45)	59.63 (SD=17.04)	1.72	88	.040
ENVIRONMENTAL QOL	58.47 (SD=11.47)	51.67 (SD=11.53)	2.81	88	.003

Bonferroni adjustment was used to determine the new alpha level for testing the present hypothesis as multiple variables are being tested in order to check for type 1 error. The new alpha level is .01.

An examination of Table 4.3 above showed that significant differences exist between healthy controls and spinal cord injury patients in their general QOL at the .01 level of significance, [$t_{(88)} = 6.12$, $p = .000$]. Comparison of the two means (Healthy controls = 16.82 and SCI = 9.42) showed that healthy controls reported a significantly higher general

QOL than SCI patients. Therefore the hypothesis that “The general quality of life of healthy controls is likely to be significantly higher than those of patients with SCI” is supported.

Further analysis of the QOL domains showed that significant differences exist between healthy controls and spinal cord injury patients in their Physical QOL at the .01 level of significance, [$t_{(88)} = 4.68, p = .000$]. Comparison of the two means (Healthy controls = 61.67 and SCI = 52.94) showed that healthy controls reported a significantly higher physical QOL than SCI patients. Thus, the physical quality of life of patients with SCI is lower compared to that of the healthy controls.

It was also observed that significant differences exist between healthy controls and spinal cord injury patients in their Psychological QOL at the .01 level of significance, [$t_{(88)} = 3.41, p = .001$]. Comparison of the two means (Healthy controls = 61.57 and SCI = 52.87) showed that healthy controls reported a significantly higher psychological QOL than SCI patients.

Results further showed that significant differences did not exist between healthy controls and spinal cord injury patients in their Social QOL at the .01 level of significance, [$t_{(88)} = 1.72, p = .040$]. Comparison of the two means (Healthy controls = 65.19 and SCI = 59.63) showed that healthy controls reported a significantly higher social QOL than SCI patients.

It was finally observed that significant differences exist between healthy controls and spinal cord injury patients in their environmental QOL at the .01 level of significance, [$t_{(88)} = 2.81, p = .000$]. Comparison of the two means (Healthy controls = 58.47 and SCI = 51.67) showed that healthy controls reported a significantly higher environmental QOL than SCI patients.

Hypothesis 3

Hypothesis three investigated the link between culture (Africentric Values) and QOL for SCI patients. It stated that “A significant positive relationship will exist between Africentric values and QOL among SCI patients”. A bivariate correlation analysis was conducted using Pearson Product-Moment Correlation Co-efficient; also known as Pearson r. Results are summarized in Table 5 below:

Table 4.4: Pearson Product-Moment Correlation Coefficient showing the relationship between Africentric values and QOL for SCI patients

Variables	1	2	3	4	5	6	7	8	9	10	11
1.SQOL											
2.PHY	.38**										
3.PSYCQOL	.52**	.82**									
4.ENVQOL	-.29*	.20	.27*								
5.TotalQOL	.41**	.35**	.34*	.16							
6.Spirituality	.07	.12	.07	-.28*	.08						
7.Intuition	.09	.09	.04	.06	.24	.16					
8.Sensitivity	.38**	.24	.07	-.33*	.19	.18	.07				
9.RsE	-.10	.06	.02	.27*	.24	-.14	.23	-.09			
10.Com	.11	.33*	.23	.07	.15	.36**	.30*	.30*	.20		
11.Orality	.05	.26*	.25*	.27*	.11	.20	.08	.12	-.10	.17	
12.TOLAFS	.07	.30*	.17	-.20	.32*	.59**	.55**	.54**	.28*	.64**	.28*

*= significant at .05 level of significant, **= significant at .01 level of significant

Notes: SR=Social QOL, PHY= Physical QOL, PSYCQOL= Psychological QOL, ENVQOL= Environmental QOL, RsE= Respect for the elderly, Com= Communalism

From the Table 5 above, Pearson r showed that there was a significant association between the total Africentric values of SCI patients and their QOL [$r_{(43)} = .32, \rho = .01$] which was significant at the .05 level of significance. This indicates that increase in Africentric values correspond with increase in overall QOL. This means that for SCI patients, their adherence to Africentric values could act as a buffer for their QOL. Thus, Hypothesis 3 was supported by the data.

Further analysis of the domains of Africentric values and domains of QOL revealed that Social QOL had significant positive relationship with sensitivity domain of Africentric values [$r_{(43)} = .38; \rho = .005$]. This indicates that the higher a SCI patient's level of sensitivity, the higher their social QOL. Also, Physical QOL had significant positive relationships with communalism [$r_{(43)} = .33; \rho = .01$], Orality [$r_{(43)} = .26; \rho = .04$] and Total Africentric values [$r_{(43)} = .30; \rho = .02$] showing that an increase in communalism, orality and total Africentric values is likely to result in an increase in physical QOL. The analysis further revealed that psychological QOL had a significant positive relationship with Orality [$r_{(43)} = .25; \rho = .04$], meaning the higher an SCI patient's value of orality, the higher his or psychological QOL. Finally, the environmental domain of QOL was found to have significant negative relationship with spirituality [$r_{(43)} = -.28; \rho = .03$] and sensitivity [$r_{(43)} = -.33; \rho = .01$] but a significant positive relationship with respect for the elderly [$r_{(43)} = .27; \rho = .03$] and orality [$r_{(43)} = .27; \rho = .04$].

Hypothesis 4

Hypothesis 4 stated that SCI patients are more likely to report a significantly higher psychological distress (Global Severity Index) than healthy controls.

For the psychological distress (BSI) measures, there was a violation of the covariance and homogeneity assumptions underlying MANOVA, hence; Pillai's Trace was selected [$F_{(4, 85)} = 32.36, p = .000$, Pillai's Trace = .604 with a Partial Eta Squared = .604]. Thus, it was confirmed that at least one of the groups being compared on at least one of the dependent variables differ. Given the significance of the overall test, the Univariate main effects were examined.

Table 4.5: Summary Table of the MANOVA Comparing Psychological Distress among SCI Patients and Healthy Control.

Variables	SCI (n=45)	Healthy (n=45)	<i>F</i>	<i>df</i>	<i>p</i>
	Mean (SD)	Mean (SD)			
Depression	1.61(.32)	.59 (.36)	56.75	1, 89	.000
Anxiety	1.37(.88)	.71 (.32)	80.59		.000
Somatization	1.34(.70)	.69 (.28)	21.81		.000
Global Severity Index	1.65(.81)	.70 (.26)	33.15		.000

Comparing the groups on the psychological distress, it was found from Table 4.5 above that the SCI patients had higher overall psychological distress (GSI) than healthy controls at the .01 level of significance, [$F_{(1,89)} = 33.15, p = .000$]. Comparison of the two means showed that SCI patients had a statistically significant higher mean distress score than healthy controls, overall distress [($M = 1.65$) > ($M = .70$)]. Therefore, the hypothesis four that SCI patients are more likely to report a significantly higher psychological distress (Global Severity Index) than healthy controls is supported.

Further analysis of the domains of the BSI subscales showed that SCI patients reported significantly higher mean depression levels than Healthy controls at the .01 level of significance, [$F_{(1,89)} = 56.75, \rho = .000$]. Comparison of the two means showed that SCI patients had a statistically significant higher mean depression score than healthy controls, [(M = 1.61) > (M = .59)].

It was also found that SCI patients reported significantly higher mean anxiety levels than Healthy controls at the .01 level of significance, [$F_{(1,89)} = 80.59, \rho = .000$]. Comparison of the two means showed that SCI patients had a statistically significant higher mean anxiety scores than healthy controls, [(M = 1.37) > (M = .71)].

Finally, it was also observed that SCI patients reported significantly higher mean somatization levels than Healthy controls at the .01 level of significance, [$F_{(1,89)} = 21.81, \rho = .000$]. Comparison of the two means showed that SCI patients had a statistically significant higher mean somatization scores than healthy controls, [(M = 1.34) < (M = .69)].

Summary of Findings

This study tested four main hypotheses to assess the cognitive functioning, psychological health and quality of life among SCI patients in Ghana. The summary of findings is presented below:

1. SCI patients performed poorer in cognitive functioning such as verbal working memory, divided attention, verbal initiation and fluency, and daily memory lapses (Digit Span, COWAT, CTT and CFQ) than healthy controls.
2. SCI patients reported lower quality of life compared to their healthy control counterparts.

3. Finally, adherence to total Africentric values or culture had a significant positive association with overall quality of life of SCI patients. Some domain specific significant relationships were also found.
4. Depression, anxiety and somatization scores were higher for SCI patients than the healthy control group. Thus, SCI patients suffered from psychological distress more than their healthy control counterparts.

Observed Model

Findings of the study led to a revision of the proposed conceptual framework. Fig 2 represents the observed model.

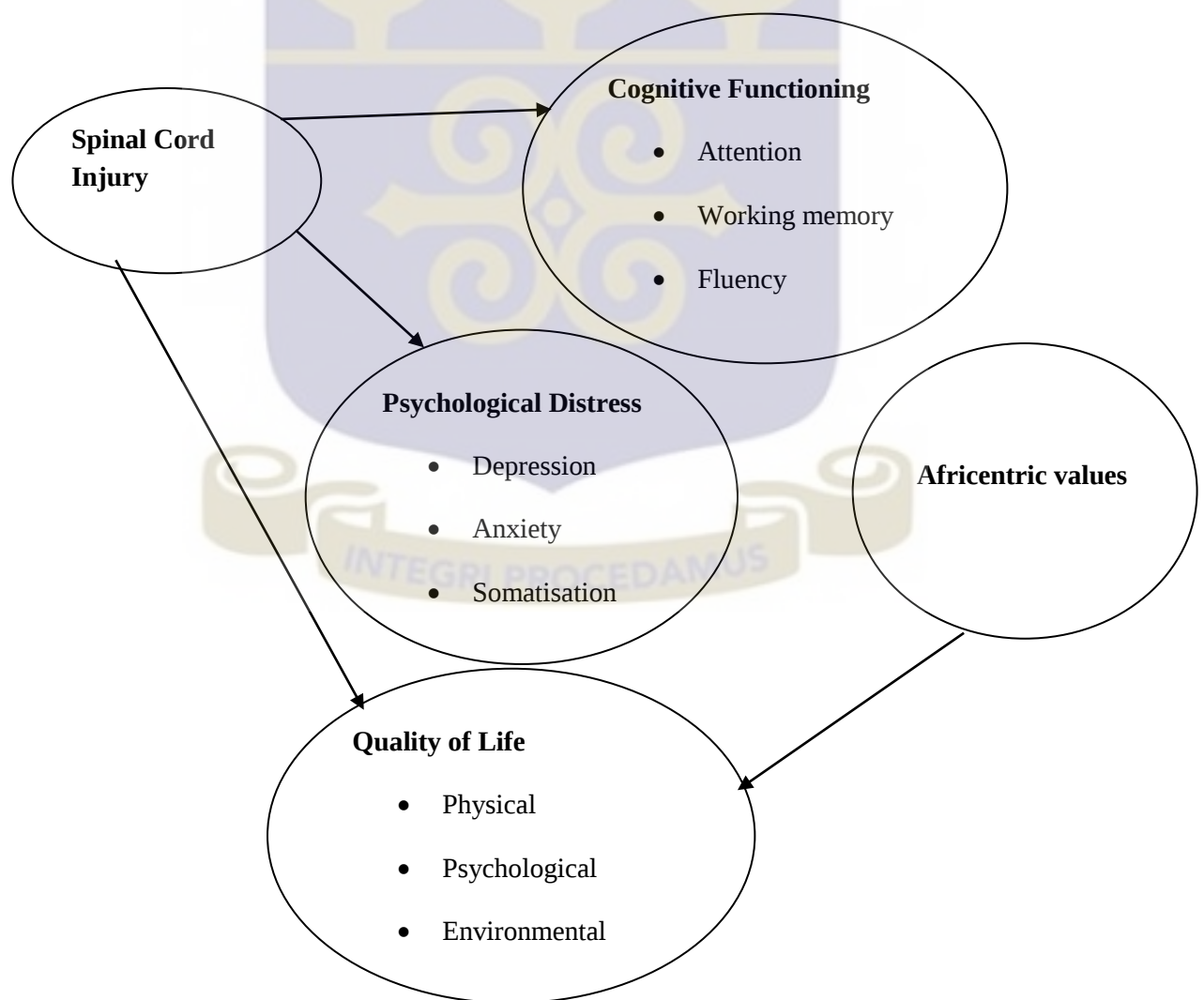


Figure 2: Observed conceptual framework

Figure 1 above shows the observed relationships among the variables of study. SCI had a significant impact on the cognitive functioning of patients. Similarly, SCI patients reported higher psychological distress in all domains; depression, anxiety and somatisation. Also SCI had a significant influence on the overall quality of life of patients as well as all domains except social quality of life. In addition, Total Africentric values had a significant positive relationship with overall quality of life but not domain-specific QOL.



CHAPTER FIVE

DISCUSSION

Introduction

The present study aimed at determining the QOL and cognitive functioning of patients with SCI. The study also sought to determine if culture (adherence to Africentric views) has an important impact on the QOL of patients with SCI. The study also examined psychological distress among SCI patients.

Consistent with expectations, results from this study indicated that SCI negatively affected cognitive functioning such as verbal working memory, divided attention, verbal initiation and fluency, and increases daily memory lapses. Similarly, QOL diminished significantly upon suffering SCI. Further, SCI patients suffered from psychological distress more than their healthy control counterparts. It was also found out that Africentric values or culture was significantly linked with overall quality of life of the SCI patients.

SCI and Cognitive Functioning

The present study sought to find out if cognitive function significantly diminished following the development of SCI. In view of this the first hypothesis was stated as *“Healthy controls are likely to perform significantly better than SCI patients on cognitive functioning.”* Using scores on the CFQ, this hypothesis was supported by the findings of the research. In other words, findings of the current research indicated that the SCI patients performed poorer on CTT and COWAT but scored higher on cognitive failures than the healthy control group respectively.

Thus the findings from this study suggest that cognitive functions such as verbal working memory, verbal initiation and fluency and divided attention are severely hampered in patients with SCI. It also meant that, the assertion that patients with SCI may have their cognitive and executive functioning such as lapses in perceptual ability, memory, and motor ability needed in the completion of day to day activities preserved (Broadbent et al., 1982; Rast et al., 2009) may be flawed. In addition, according to Berry et al. (2014), though SCI effector motor neurons resulting in paralysis beneath the damaged level, areas or centres for planning, coordination in the brain, and peripheral nerve cells and their corresponding muscles remain efficient. This assertion may also not be entirely accurate as the present study revealed that other cognitive functions such as working memory and divided attention which may not be directly linked with motor neurons associated with paralysis may be affected in SCI patients.

The results from this research confirms the postulations of the executive function theory which posits that direct impact of SCI on the frontal regions of the brain may affect executive functions since deficits were found in functions such as working memory and divided attention. However, the deficits found in this study are not only limited to functions of the frontal regions of the brain, which suggests that the diffused axonal injury resulting from SCI may affect certain neural networks that are crucial for these cognitive tasks. This means that SCI may not only affect executive functions but also other cognitive functions may be compromised. As suggested by Roth et al. (2009), it is attention span and initial learning ability that is mostly affected in SCI patients and not executive function. The current results are in agreement with findings from Davidoff et al. (1992) which suggested that consequences of even minor cognitive deficits include “attention difficulties, difficulty with concentration, memory, problem solving, abstract reasoning,

new learning, and higher-level cognitive skills” (p. 275). Current findings further lend credence to the findings of Dowler et al. (2011) where results showed that information processing speed was the function that best distinguished between the SCI group and healthy controls as 29% of the SCI patients scored less than 1 to 2 standard deviations of the scores of the healthy control mean. Roth et al. (2009) also found that decreased attention and restricted initial learning capacity were rampant complications among the SCI population; other impairments reported are; reduced concentration, deficits in memory function, and reduced problem solving skill.

The current finding, particularly those relating to performance on the CFQ, is not surprising. It is the view of the researcher that since most of participants are adults, activities of daily living which the CFQ measures have been acquired already and preserved in memory by the participants. It follows that, the SCI patient may not be able to learn new tasks and solve new problems that confront him/her prior to rehabilitation.

The implications of this are not far-fetched. First of all, suffering an SCI in Ghana will render one “alive but dead”. Secondly, the hassles of life are predominantly dependent on cognition, then suffering an SCI resulting in these significant cognitive deficits with no hope of recovery may be extremely detrimental to the individual. Simple tasks such as walking/movement cannot be performed (Berry et al., 2014) rendering the individual stationary (or sometimes bed-ridden) and may be very debilitating for the individual.

Quality of Life of SCI patients and Healthy Controls

The study also sought to find out whether QOL is decreased following SCI. It was accordingly posited that “*The quality of life of healthy controls will be higher than that of SCI patients*”. Consistent with the reviewed literature and expectation of the researcher,

the outcomes from the Independent *t* test confirmed that SCI patients had lower quality of life than the healthy controls. When analysed further according to the four subscales, there was significant disparities between the QOL of healthy controls and the SCI group. More specifically, the Healthy Controls performed better on three of the four subscales compared to the SCI sample. This result suggested that physically, psychologically, and environmentally, Healthy Controls have higher QOL compared to SCI patients. This result suggested that apart from social quality of life, healthy controls have higher QOL in other domains compared to SCI patients.

Due to the debilitating nature of SCI, patients' perception of life satisfaction would be affected as their injury renders them unable to meet their daily needs. They have to depend on others for their needs. Secondly, tasks they used to do with ease can no longer be performed. This would affect their QOL significantly. Their standing in society and ability to meet society's expectations of an adult may also be compromised. Following the tenets of the integrative theory of quality of life, the subjective, objective and existential domain of QOL will be compromised as an SCI patient is mostly incapable of meeting the criteria for judging satisfaction with the current state of one's life from the individual's perspective and from the society's expectations as well. Thus patients with SCI perceive their QOL as poor since they consider their life as bad and lacking contentment. It is not out of place for patients with SCI to perceive their lives as bad and lacking contentment since they cannot do even the very little things they used to do on their own. QOL also discloses itself through the capacity of the individual in adapting to the values of their culture. The application of this theory in our Ghanaian cultural context is that, an adult is one perceived as capable of being independent and doing things for himself or herself. Patients with SCI, having suffered the illness and rendered incapable of doing anything, lose their "adult"

status, dignity and respect having regressed to childhood. Consequently, it was not surprising therefore that patients with SCI perceive and indeed reported lower QOL compared to their healthy control counterparts.

It was however found that the social domain of QOL among the SCI patients was not considerably different from that of the healthy controls. This finding can be explained with reference to the increasing individualism and nucleation of the Ghanaian family system. This means that individuals are increasingly becoming less dependent on their external and social environment. Therefore people hardly assess the quality of their life today in relation with others. This explains why social quality of life was not influenced by SCI, because as it is already, many people have poor social quality of life in today's fast growing world where little emphasis is placed on social relations compared to previous times (Atefoe & Kugbey, 2014). This means that no significant disparity exists between the social quality of life of those who have severe chronic conditions such as SCI and healthy controls.

It is trite learning and quite settled by previous studies to expect that the development of SCI will significantly reduce the QOL of patients. For instance as previous literature suggest, QOL is reported to decrease in patients with SCI (Geyh et al., 2013; Leduc & Lepage, 2002; Saadat et al., 2010) across cultures. QOL is a reflection of one's general perceived satisfaction with current happenings in his/her life (Hartkopp et al., 1997; Siosteen et al., 1990; Whiteneck, 1994; Wood-Dauphinee & Exner, 2005) and allows everyone to choose the areas of greatest importance. Proceeding from that definition and explanation, it can only be said that a person who was once strong, athletic and mobile

who suddenly becomes stationery and in some cases bed-ridden will perceive (at least) his/her life to be of low quality compared to one who has not suffered SCI.

The implication of this result may be far reaching than one could imagine. For instance, while it is settled that developing SCI has serious repercussions for the sufferer (Dijkers, 2005; North, 1999; Singh et al., 2012; WHO, 2013), Ebrahimzadeh et al. (2013) found that suffering SCI even affects caregivers, relatives family members and significant others. On the individual level, an SCI patient may possibly conclude that his/her life has effectively ended upon the development of an SCI. Having concluded so, the person may possibly perceive his/her quality of life as diminished even without thinking about the debilitating effects the injury often comes with. In terms of effect, the pain, incontinence and co-morbid conditions that often come with SCI significantly reduce the QOL of its sufferers.

The current finding can also be explained using Erikson's psychosocial stages of development theory (Erikson, 1964; Westie, 1987). Clearly, a person who once went through all these developmental stages and has long transcended these stages only to regress to stage one will definitely rate his/her QOL as poor compared to one who hasn't.

Relationship between culture and Quality of Life among patients with SCI

The current study further sought to determine if a relationship exists between culture (Africentric views) and QOL. It has long been settled by research that culture influences the worldview, QOL and recovery of SCI patients (Parker, Garcia & Schaller, 1998; Thompson, 1997; Triandis et al., 1986; Hofstede, 1980). Specifically, it was postulated that *"A significant positive relationship will exist between culture and QOL among SCI patients"*. The results showed a statistically significant association between cultural values and quality of life among SCI patients.

The result is in agreement with earlier works which revealed how cultural values could influence the wellbeing and quality of life of persons living with chronic illnesses. For instance, Arango-Lasprilla (2015) reports of people with neurological impairments experiencing physical, cognitive, behavioural, and/or emotional challenges which need to be addressed by rehabilitative services. In a country such as Ghana, such rehabilitation services are limited; hence these patients have to face the consequence of declined QOL and poor prognosis.

As revealed by the integrative theory of quality of life, QOL does not only depend on the individual's subjective view about satisfaction with his or her life but also includes the ability to integrate well into one's culture. It is thus not unexpected that the current research determined that adherence to Africentric values had a significant positive relationship with QOL. This implies that an SCI patient who is able to adhere better to Africentric cultural values is also likely to report better QOL. This confirms the assertion that the ability of a person to integrate well or adapt into the cultural values of his or her society is a very crucial component of QOL.

SCI and Psychological Distress

Living with any medical condition presents both physical and psychological challenges to the individual which must be dealt with to ensure better health outcomes. The study also sought to find out whether SCI has a significant influence on the psychological health of patients. Results from this study revealed that SCI patients experience significantly higher psychological distress such as depression, anxiety and somatization than their healthy control counterparts. This finding can be attributed to the fact that spinal cord injury places a lot of physical, social, psychological and economic limitations on the individual and

caregivers which put pressure on the limited coping resources at the disposal of the individual before and after the accident. For instance, the sufferers of SCI mostly are not capable of walking and going about their normal day-to-day activities and must therefore rely on people for their up-keep. This situation could result in sadness, self-pity, hopelessness, fear, agitation and helplessness which are all indications of poor psychological wellbeing. Thus, the experience of higher depression, anxiety and somatization by spinal cord injury patients might be the result of these personal as well as interpersonal challenges that the patients must deal with in living with their illness.

As suggested by the stages theory, an SCI patient has to go through certain stages in adjusting with the condition. These stages may have certain psychological outcomes for the individual depending on whether the progression through the stages has been smooth or not as well as how long it is resolved. An individual who is stuck in the depression or anxiety stage and is unable to progress to the stage of acceptance and adaptation for instance would definitely experience psychological distress. The theory also did not explain how long it takes to progress from one stage to another. The reduced QOL among SCI patients may also affect their psychological health. An individual who is dissatisfied with his or life is likely to experience psychological distress such as depression, hopelessness and even suicidal ideation (Dijkers, 2005). The findings from this study that spinal cord injury patients experience higher psychological problems in the form of depression, anxiety and somatization are congruent with previous works by Anderson et al. (2007) who conducted a research on adults who had sustained SCI as children and found that 27% of the patients indicated symptoms of depression ranging from mild to severe, 7% reported experiencing suicide ideas and 3% of the respondents reported symptoms

consistent with possible major depressive disorder. Other researchers also reported negative psychological health among SCI patients (Craig et al., 2008; Singh et al., 2012; Soden et al., 2007)

Limitations

Findings from the current study are encouraging for SCI in Ghana; particularly since this is the first of its kind in Ghana. However, it must be noted that the research was somewhat limited by its design. In the first instance, the data collected was mostly self-reports, hence prone to bias. This aspect of the study however does not differ from past studies (North, 1999; Singh, Rohilla, Siwach, Dhankar & Kaur, 2012). It is also important to acknowledge that contemporary study suggests that data from self-reports are not as narrow as was formerly thought, and that people frequently perceive their social environment and experiences correctly. However, the researcher does not have data to show that these reported measures of cognitive function and QOL are predictors of “objective” measure of cognitive function and QOL as experienced by the participants.

Secondly, limitation pertains to the concept of external validity. To a large extent, the results of this study is limited to first of all, the sample, and secondly the parent population. A sample of 90 participants involving 45 participants in each group may not be sufficient to make general conclusions about all SCI patients. However, financial and ethical constraints severely hampered the efforts of the present researcher at using a larger sample size than is the case. Indeed, the research struggled to get participants for the study; sometimes to the extent of going to people’s homes in search of participants. The implication of the limited sample size is that in drawing any conclusions, caution must be taken.

In addition, the researcher was unable to screen participants in order to rule out concurrent Traumatic Brain Injury (TBI), the deficits found among SCI patients in this study can therefore not be attributed solely to the SCI since some patients may have suffered associated TBI.

Implications for practice

Findings from this study have both theoretical and practical implications. By way of theoretical significance, findings of this study will add on to the literature by providing information on the topic from the Ghanaian perspective. Findings of the study provide benchmark data which can be used for future research.

Results of the current study showed that, SCI results in poor behavioural and cognitive functioning. The results suggest that in Ghanaian SCI populations, verbal fluency deficits, memory and attention deficits are most prominent. The generally low QOL found among the SCI sample is also of serious concern for practitioners. In Ghana where living standards are generally already low, a further diminished QOL as a result of suffering SCI must be of paramount concern for all. This implies that the management of SCI should include psychological and neurocognitive treatment. This is because as revealed by the present study, SCI results in cognitive and psychological/behavioural complications which need to be addressed in order to make any headway in the effective management of the condition.

In addition, culturally appropriate interventions should be used to help SCI patients adapt well into society as the current research established a significant positive association between Africentric values and QOL.

Recommendations for future research

Future research should use other sources in addition to those used in the current research in evaluating the research topic among participants. It is also recommended that future research in the Ghanaian context should explore more person variables, expand the scope of the research and explore more local variables. This will be beneficial to practitioners and other stakeholders in the Ghanaian context. It is further suggested that future studies employ qualitative research design or at least a combination of both quantitative and qualitative designs.

In addition, it would be helpful for future studies to add care-givers of SCI as they are an essential part of the experience and management of the condition. These care-givers may also share important characteristics with the SCI patients which may be helpful in making comparisons.

Conclusion

This study particularly aimed to assess the cognitive and behavioural functioning of SCI patients in Ghana. The results provided empirical evidence of poor cognitive function among participants following the development of SCI. The study also indicated that, following the development of SCI, people perceive and experience low quality life as defined and measured by the WHO and increased psychological distress. These findings fitted into the theoretical framework and largely supported the literature reviewed.

In the event of a SCI, one must learn to live with it along with its complications. The inability or failure on the part of these persons to effectively do this may have dire consequences for their cognitive and behavioural functioning as revealed by this study.

This also implies that, a painstaking effort must be made to first of all educate patients and provide them with an insight into their condition, as well as make psychological and neurocognitive treatment options available to help these patients manage their condition better as well as their rehabilitation.

Finally future studies can expand on this work by adding qualitative data and also including care-givers of these patients in order to enrich the literature on SCI and its management in Ghana.



REFERENCES

- Anderson, S.W. & Tranel, D. (2002). Consequences of dysfunction in human dorsolateral prefrontal cortex. In Boller, F., Grafman, J. & Grafman, J. (eds). *Handbook of neuropsychology*, 7(2) pp. 145-156. The frontal lobes. Amsterdam: Elsevier.
- Anderson, C. J., Vogel, L. C., Betz, R. R., Chlan, K. M. & McDonald, C. M. (2007). Depression in adults who sustained spinal cord injuries as children or adolescents. *Journal of Spinal Cord Medicine*, 30(1), 76 - 82.
- Antonovsky, A. (1987). Unravelling the mystery of health: How people manage stress and stay well. *The Jossey-Bass social and behavioural science series*, 218.
- Apple, D. F. Jr, Anson, C. A., Hunter, J. D. & Bell, R. B. (1995). Spinal cord injury in youth. *Clinical Paediatrics*, 34(2), 90-95.
- Atefoe, A. E. & Kugbey, N. (2014). Social relationships among women in Ghana: A blessing or a curse to their psychological well-being? *Journal of Advocacy, Research and Education*, 1(1), 15-19.
- Belgrave, F. Z. & Allison, K. W. (2006). *African American psychology: From Africa to America*. Thousand Oaks, CA: Sage
- Belgrave, F. Z., Townsend, T. G., Cherry, V. R. & Cunningham, D. M. (1997). The influence of an Africentric worldview and demographic variables on drug knowledge, attitudes, and use among African American youth. *Journal of Community Psychology*, 25, 421–433.
- Biering-Sorensen, F., Scheuringer M, Baumberger M, Charlifue S. W., Post, M. W. & Montero, F. (2006). Developing core sets for persons with spinal cord injuries based on the international classification of functioning, disability and health as a way to specify functioning. *Spinal Cord*, 44, 541–546.

- Boakye, M., Leigh, B. C. & Skelly, A. C. (2012). Quality of life in persons with spinal cord injury: comparisons with other populations. *Journal of Neurosurgical Spine*, 17(1), 29-37.
- Boden, B. P. & Jarvis, C. G. (2009). Spinal injuries in sports. *Physical medicine and rehabilitation clinics of North America*, 20(1), 55 - 68.
- Boschen, K. A. (1996). Correlates of life satisfaction, residential satisfaction, and locus of control among adults with spinal cord injuries. *Rehabilitation Counseling Bulletin*, 39, 230-243.
- Boswell, B. B., Dawson, M. & Heininger, E. (1998). Quality of life as defined by adults with spinal cord injuries. *The Journal of Rehabilitation*, 64 (1), 27 - 32.
- Bridgers, R. S., Johnsen, S. A. & Brasher, K. (2013). Psychometric properties of the Cognitive Failures Questionnaire. *Ergonomics*, 56 (10), 1515 – 1524.
- Brown, L. B., Nicholson, T. R., Aybek, S., Kanaan, R. A. & David, A. S. (2013). Function and memory suppression in conversion disorder. *Journal of Neuropsychology*, 12, 4-20.
- Buckelew, S. P., Frank, R. G., Elliott, T. R., Chaney, J. & Hewett, J. (1991). Adjustment to spinal cord injury: stage theory revisited. *Paraplegia*, 29, 125 - 130.
- Burgess, P. W., & Alderman, N. (2004). Executive dysfunction. In Goldstein, L. H. & McNeil, J. E. (Eds.), *Clinical Neuropsychology: A practical guide to assessment and management for clinicians* (pp. 185- 209). Chichester, England: John Wiley & Sons.
- Chacko, V. Joseph, B, Mohanty, S. P. & Jacob, T. (1986). Management of spinal cord injury in a general hospital in rural India. *Paraplegia* 24(5), 330 - 335.

- Christpher, J. C. (1999). Situating psychological well-being: Exploring the cultural roots of its theory and research. *Journal of Counseling and Development*, 77, 141 - 152.
- Craig, A. & Perry, K. N. (2008). Guide for health professional on the psychosocial care of people with spinal cord injury. *New South Wales State Spinal Cord Injury Service*, 1(2), 1-42.
- Csikszentmihalyi, M. & Nakamura, J. (1999). Emerging goals and the self-regulation of behaviour. *Advances in social cognition*, 12, 107 - 118.
- Cushman, L. A. & Hassett, J. (1992). Spinal cord injury: 10 and 15 years after. *Paraplegia*, 30, 690-696.
- Davidoff, G. N., Roth, E. J. & Richards, J. S. (1992). Cognitive deficits in spinal cord injury: epidemiology and outcome. *Archives of Physical Medicine and Rehabilitation*. 73(3), 275-84.
- Davidoff, G., Roth, E., Thomas, P., Doljanac, R., Dijkers, M., Berent, S., Morris, J., & Yarkony, G. (1990). Depression and Test Performance in Acute Spinal Cord Injury Patients: Lack of Correlation. *Archives of Clinical Neuropsychology*, 5, 77-88.
- Dawson, D. R., Catanzaro, A. M., Chan, M., Haley, M., Nguyen, T. A., Schwartz, M., Williams, N., Winocur, G., & Stuss, D. T. (2004). Changes in life attitude following traumatic brain injury and their relationship to community integration. *Archives of Physical Medicine and Rehabilitation*, 85, 8.
- Decker, S. D., & Schulz, R. (1985). Correlates of life satisfaction and Depression in middle-aged and elderly spinal cord-injured persons. *The American Journal of Occupational Therapy*, 39, 740-745.

- Devivo, M. J., Shewchuk, R. M., Stover, S. L., Black, K. J., & Go, B. K. (1992). A cross-sectional study of the relationship between age and current health status for persons with spinal cord injuries. *Paraplegia*, 30, 820-827.
- Deconinck, H. (2003). The health condition of spinal cord injuries in two Afghan towns. *Spinal Cord*, 41(5), 303 - 309.
- Derogatis, L. R. (1993). *Brief Symptom Inventory (BSI): Administration, Scoring and Procedure Manual* (4th Ed.). Minneapolis, MN: National Computer Systems.
- Derogatis, L. R. (2001). *Brief Symptom Inventory (BSI-18): Administration, scoring and procedures manual*. Minneapolis, MN: NCS Pearson.
- Diener, E., Suh, E. M., Smith, H., & Shao, L. (1995). National differences in reported subjective wellbeing: why do they occur? *Social Indicators Research*, 34, 7–32.
- Diener, E., & Suh, E. M. (1999). National differences in subjective well-being. In: Kahnemann D., Diener, E., & Schwarz, N. (eds). *Well-Being the Foundations of Hedonic Psychology*. New York: Russell Sage Foundation
- Dijkers, M. P. J. (2005). Quality of life of individuals with spinal cord injury: A review of conceptualization, measurement, and research findings. *Journal of Rehabilitation and Development*, 24(3), 87-110
- Ditunno, P. L., Patrick, M., Stineman, M., Morganti, B., Townson, A. F., & Ditunno, J. F. (2006). Cross-cultural differences in preference for recovery of mobility among spinal cord injury rehabilitation professionals. *Spinal Cord*, 44, 567–575.
- Divanoglou, A., & Levi, R. (2009). Incidence of traumatic spinal cord injury in Thessaloniki, Greece and Stockholm, Sweden: a prospective population-based study. *Spinal Cord*, 47(11), 796-801.

- Dowler, S. A., O'Brien, K.Y., Haaland, D. L., Harrington, F. F., & Fiedler, K. (2011). Functioning following a spinal cord injury. *Applied Neuropsychology*, 2(34) 124-129
- Dowler R, Richards J. S., Putzke J. D., Gordon W., & Tate, D. (2001). Impact of demographic and medical factors on satisfaction with life after spinal cord injury: a normative study. *Journal of Spinal Cord Medicine*, 24, 87–91.
- Dezarnaulds, A., & Ilchef, R. (2013). Psychological adjustment after spinal cord injury: Useful strategies for health professionals. *Agency for Clinical Innovation*, 1–20.
- Ebrahimzadeh, M. H., Shojaei, B. F., Golhasani-Keshtan, F. G., Soltani-Moghaddas, S. H., Fattahi, A. S., & Mazloumi, S. M. (2013). Quality of life and the related factors in spouses of veterans with chronic spinal cord injury. *Health and Quality of Life Outcomes*, 11, 48
- Elliott, T. R., & Kennedy, P. (2004). Treatment of depression following spinal cord injury: An evidence-based review. *Rehabilitation Psychology*, 49, 134 - 139.
- Emerich, L., Kenneth C., Parsons, K. C., & Stein, A. (2012). Competent care for persons with spinal cord injury and dysfunction in acute inpatient rehabilitation. *Spinal Cord Injury Rehabilitation*. 18(2), 149 - 166.
- Espe-Pfeifer, P., & Wachsler-Felder, J. (2000). Interpretation of Objective Psychological Tests. *Springer*, 160.
- Feldman, R. P., & Goodrich, J. T. (1999). The Edwin Smith Surgical Papyrus. *Child's Nervous System*, 15(67), 281–284.
- Finnerup, N. B., Johannesen, I. L., Fuglsang-Frederiksen, A., Bach, F. W., & Jensen, T. S. (2003). Sensory function in spinal cord injury patients with and without central pain. *Brain*, 126, 57-70

- Fraser, H. S., & McGrath, S. J. (2000). Information technology and telemedicine in sub-Saharan Africa. *British Medical Journal*, 321(7259), 465 - 466.
- Furlan, J. C., & Fehlings, M. G. (2009). Epidemiology and clinical outcomes of acute spine trauma and spinal cord injury: experience from a specialized spine trauma center in Canada in comparison with a large national registry. *The Journal of Trauma*, 67(5), 936 - 943.
- Furlan, J. C., Bracken, M. B., & Fehlings, M. G. (2010). Is age a key determinant of mortality and neurological outcome after acute traumatic spinal cord injury? *Neurobiology of Aging*. [Epub ahead of print]. [PubMed]
- Gentilello, L. M., Rivara, F. P., Donovan, D. M., Jurkovich, G. J., Duraciang, E., Dunn, C.W., Villaveces, A., Copass, M., & Ries, R. R. (1999). Alcohol interventions in traumatic centre as a means of reducing risk of injury occurrence. *Annals of Surgery*, 23, 473-480.
- Gerhart, K. A., Koziol-McLain, J., Lowenstein, S. R., & Whiteneck, G. G. (1994). Quality of life following spinal cord injury: knowledge and attitudes of emergency care providers. *Annals of Emergency Medicine*, 23(4), 807 - 812.
- Geyh, S., Fellinghauer, B. A. G., Kirchberger, I., & Post, M. W. (2010). Cross-cultural validity of four quality of life scales in persons with spinal cord injury. *Health Quality of Life Outcomes*, 8, 94.
- Gill, M. (1992). Psychosocial implications of spinal cord injury. *Critical Care Nursing Quarterly*, 22, 1 - 7.
- Gosselin, R. A., & Coppotelli, C. (2005). A follow-up study of patients with spinal cord injury in Sierra Leone. *International Orthopaedics*, 29(5), 330 - 332.
- Grahn, P. T., Mallory, G. W., Berry, B. M., Hachmann, J. T., Lobel, D. A., & Lujan, J. L. (2014). Restoration of motor function following spinal cord injury via optimal

control of intraspinal microstimulation: toward a next generation closed-loop neural prosthesis. *Frontal Neuroscience*.

Griffiths, H. C., & Kennedy, C. D. (2012). Continuing with life as normal: Positive Psychological Outcomes Following Spinal Cord Injury. *Top Spinal Cord Injury Rehabilitation*. 18(3), 241-252.

Groot S. (2008). Changes and determinants of life satisfaction after spinal cord injury: a cohort study in the Netherlands. *Archive of Physical Medical Rehabilitation*, 89, 1733–1740.

Groth-Marnat, G., & Baker, S. (2003). Digit Span as a measure of everyday attention: A study of ecological validity. *Perceptual and Motor Skills*, 91, 1209 – 1218

Gurcay, E., Bal, A., Eksioglu, E., & Cakci, A. (2010). Quality of life in patients with spinal cord injury. *International Journal of Rehabilitation Research*, 33(4), 356-358.

Hammell, K.W. (2004). Exploring quality of life following high spinal cord injury: a review and critique. *Spinal Cord*, 42, 491–502.

Hampton, N. Z., & Marshall, A. (2000). Culture, gender, self-efficacy, and life satisfaction: a comparison between Americans and Chinese people with spinal cord injuries. *Journal of Rehabilitation*, 66, 21–28.

Heinemann, A.W., Doll, M. D., Armstrong, K. J., Schnoll, S., & Yarkony, G. M. (1991). Substance use and receipt of treatment by persons with long term spinal cord injuries. *Archives of Physical Medicine and Rehabilitation*, 72, 482-487.

Hill, M. R., Noonan, V. K., Sakakibara B. M., & Miller, W. C. (2010) Quality of life instruments and definitions in individuals with spinal cord injury: a systematic review. *Spinal Cord*, 48, 438–450.

- Hu, Y., Mak, J. N., Wong, Y. W., Leong, J., & Luk, K. D. (2008). Quality of life of traumatic spinal cord injured patients in Hong Kong. *Journal of Rehabilitation Medicine*, 40(2), 126 - 31.
- Hess, D. W., Marwitz, J. H., & Kreutzer, J. S. (2003). Impairments after spinal cord injury: A comparative study with mild traumatic brain injury. *Rehabilitation Psychology*, 48(3), 151 - 156
- Ide, M., & Fugl-Meyer, A. R. (2001). Life satisfaction in persons with spinal cord injury: a comparative investigation between Sweden and Japan. *Spinal Cord*, 39, 387–393.
- Igun, G. O., Obekpa, O. P., Ugwu, B. T., & Nwadiaro, H. C. (1999). Spinal injuries in the Plateau State, Nigeria. *East African Medical Journal*, 76(2), 75 - 79.
- Jang, Y., Hsieh, C. L., Wang, Y. H., & Wu, Y. H. (2004). A validity study of the WHOQOL-BREF assessment in persons with traumatic spinal cord injury. *Archive of Physical Medicine and Rehabilitation*, 85, 1890–1895.
- Jensen, M. P., Moore, M. R., Bockow, T. B., Ehde, D. M., & Engel, J. M. (2011). Psychosocial Factors and Adjustment to Chronic Pain in Persons with Physical Disabilities: A Systematic Review. *Archive of Physical Medicine and Rehabilitation*, 92(1), 146 – 160.
- Kaufman, A., & Kaufman, N. (2004). *Manual of the Kaufman Assessment Battery for Children*, 2nd. Edition. Pearson Assessments.
- Keith, K., Heal, L. W., & Schalock, R. L. (1996). Cross-cultural measurement of critical quality of life concept. *Journal of Intellectual and Developmental Disability*, 21(4), 273-293.

- Kennedy, P., & Rogers, B. A. (2000) Anxiety and depression after spinal cord injury: a longitudinal analysis. *Archive of Physical Medicine Rehabilitation*, 81, 932 - 937.
- Kennedy, P., & Duff, J. (2001) Post traumatic stress disorder and spinal cord injuries. *Spinal Cord*, 39, 1 - 10.
- Kennedy, P., Matthew, E., & Sandhu, N. (2008). Psychological adjustment to spinal cord injury: The contribution of coping, hope and cognitive appraisal. *Taylor and Francis Online*, 17 – 33.
- Kennedy P., Lude P., & Taylor, N. (2006). Quality of life, social participation, appraisals and coping post spinal cord injury: a review of four community samples. *Spinal Cord*, 44, 95–105.
- Kewman, D. G., & Tate, D. G. (1998). Suicide in SCI: A psychological autopsy. *Rehabilitation Psychology*, 43(2), 143-151.
- Kivisild, A., Sabre, L., Tomberg, T., Ruus, T., Kõrv, J., Asser, T., & Linnamägi, Ü. (2014). Health-related quality of life in patients with traumatic spinal cord injury in Estonia. *Spinal Cord*, 52, 570 - 575.
- Kraus, J. f, Franti, C. E., Riggins, R. S., Richards, D., & Borhani, N. O. (1975). Incidence of traumatic spinal cord lesions. *Journal of Chronic Disabilities*. 28(9), 471-92.
- Krause, J. S., & Anson, C. A. (1997). Adjustment after spinal cord injury: Relationship to gender and race. *Rehabilitation Psychology*, 42(1), 31-46.
- Krause, J. S., & Dawis, R. (1992). Prediction of life satisfaction after spinal cord injury: A four year longitudinal approach. *Rehabilitation Psychology*, 37, 49-59.
- Kreuter, M., Siosteen, A., Erholm, B., Bystrom, U., & Brown D. J. (2005). Health and quality of life. In Songhuai L, Olver L, Jianjun L, Kennedy P, Genlin L, &

- Duff J. (2009). A comparative review of life satisfaction, quality of life and mood between Chinese and British people with tetraplegia. *Spinal Cord*, 47, 82–86.
- Kirshblum, S., Campagnolo, D., & Delisa, J. (2001). *Spinal Cord Medicine*. Lippincott Williams & Wilkins.
- Ku, J. H. (2007). Health-related quality of life in patients with spinal cord injury: review of the short form 36-health questionnaire survey. *Yonsei Medical Journal*, 48, 360–370. Life of persons with spinal cord lesion in Australia and Sweden. *Spinal Cord*, 43, 123–129.
- Kubler-Ross, E. (1969). *On Death and Dying*, New York: MacMillan Publishing Company, Inc.
- Leduc, B. E., & Lepage, Y. (2002). Health-related quality of life after spinal cord injury. *Disability Rehabilitation*, 24(4), 196–202.
- Lezak, M. D. (1994). Domains of behaviour from a perspective: The whole story. In W. Spaulding, (Ed), *41st Nebraska Symposium on Motivation, 1992-1993*. Lincoln: University of Nebraska Press.
- Lezak, M. D. (1995). *Assessment*, UK: Oxford University Press.
- Lidal I. B., Huynh, T. K., & Biering-Sorensen, F. (2007). Return to work following spinal cord injury: a review. *Journal of Disability Rehabilitation*, 29, 1341–1375.
- Lidal I. B., Veenstra, M., Hjeltne N., & Biering-Sorensen, F. (2008). Health-related quality of life in persons with long-standing spinal cord injury. *Spinal Cord*, 46, 710–715.
- Lin, V. W. H., Cardenas, D. D., Cutter, N. C., Frost, F. S., & Hammond, M. C. (2002). *Spinal Cord Medicine: Principles and Practice*. Demos Medical Publishing.

- Lindenmann, E. (1944). Symptomatology and Management of Acute Grief. *American Journal of Psychiatry*, 101, 143.
- Lucke, K.T., Coccia, H., Goode, J. S., & Lucke, J. F. (2004). Quality of life in spinal cord injured individuals and their caregivers during the initial 6 months following rehabilitation. *Quality Life Research*, 13(1), 97-110.
- Lucke Jensen, M. P., Moore, M. R., Bockow, T. B, Ehde, T. M., & Joyce M. Engel, J. M. (2012). Psychosocial Factors and Adjustment to Chronic Pain in Persons with Physical Disabilities: A Systematic Review. *Archives of Physical Medicine Rehabilitation*, 92(1), 146–160.
- Macciocchi S., Seel R. T., Thompson N., & Byam R. (2008). Spinal cord injury and co-occurring traumatic brain injury: assessment and incidence. *Archive of Physical Medicine Rehabilitation*, 89, 1350 – 1357.
- Maharaj, J. C., (1996). Epidemiology of spinal cord injury in Fiji: 1985- 1994. *Spinal Cord*, 34(9), 549 - 559.
- Maynard, F., & Muth, A. (1987). The choice to end life as a ventilator-dependent quadriplegic. *Archives of Physical and Medical Rehabilitation*, 68, 862 – 864.
- Mehnert, T., Krauss, H. H., Nadler, R., & Boyd, M. (1990). Correlates of life satisfaction in those with disabling conditions. *Rehabilitation Psychology*, 35, 3-17.
- Mertens, V. B., Gagnon, M., Coulombe, D., & Messier, C. (2006). Exploratory factor analysis of neuropsychological tests and their relationship to the Brown-Peterson task. *Archives of Clinical Neuropsychology*, 21(7), 733 – 739.
- Middleton, J., Tran, Y., & Craig, A. (2007). Relationship between quality of life and self-efficacy in persons with spinal cord injuries. *Archives of Physical Medicine and Rehabilitation*, 88(12), 1643 - 1648.

- Millar, K., Nicoll, J. A. R., Thornhill, S., Murray, G. D., & Teasdale, G. M. (2013). Long term outcome after head injury: relation to APOE genotype. *Journal of Neurology and Neurosurgical Psychiatry*, 74, 1047–1052.
- Mitchell, A. J., Benito-León, J., González, J. M., & Rivera-Navarro, J. (2005). Quality of life and its assessment in multiple sclerosis: integrating physical and psychological components of wellbeing. *Lancet Neurology*, 4, 556–66
- Morris, E., Roth, J. E., & Davidoff, G. (1986). Mild Closed Head Injury and Cognitive Deficits in Spinal-Cord-Injured Patients: Incidence and Impact," *Journal of Head Trauma Rehabilitation*, 1(2), 31-42.
- Mortenson, W. B., Noreau, L., & Miller, W. C. (2010). The relationship between and predictors of quality of life after spinal cord injury at 3 and 15 months after discharge. *Spinal Cord*, 48, 73–79.
- Murray, R. F., Asghari, A., Egorov, D. D., Rutkowski, S. B., Siddall, P. J., Soden, R. J., & Ruff, R. (2007). Impact of spinal cord injury on self-perceived pre- and postmorbid cognitive, emotional and physical functioning. *Spinal Cord*, 45(6), 429-36
- The National Spinal Cord Injury Statistical Center. (March, 2013). *Spinal Cord Injury Facts and Figures at a Glance*, Birmingham, AL: University of Alabama at Birmingham.
- Noggle, C. A. R., Dean, S., & Horton, M. A (2012). *Encyclopaedia of Disorders*. Springer Publishing Company
- North, N.T. (1999). The psychological effects of spinal cord injury: a review. *Spinal Cord*, 37, 671 - 679.
- O'Connor, R. J. (2006). Review of spinal cord injuries in Ireland. *Spinal Cord*, 44(7), 445 – 448

- Oishi, S., Diener, E. F., Lucas, R. E., & Suh, E. M. (1999). Subjective Well-Being. *Journal of Personality*, 67(1), 157 – 184.
- Pennington, B. F. (2002). The development of psychopathology: Nature and nurture. *Child Neuropsychology*, 8(2), 144-145.
- Pollard C., & Kennedy, P. (2007). A longitudinal analysis of emotional impact, coping strategies, and post-traumatic psychological growth following spinal cord injury: a 10-year review. *British Journal of Health Psychology*, 12, 347–362.
- Post, M., & Noreau, L. (2005). Quality of life after spinal cord injury. *Journal of Neurological Physiotherapy*, 29, 139–146.
- Radnitz, C. L., Schlein, I. S., & Hsu, L. (2000). The effect of prior trauma exposure on the development of PTSD following spinal cord injury. *Journal of Anxiety Disorders*, 14(3), 313 - 24.
- Rahimi-Movaghar, V., Saadat, S., Rasouli, M. R., Ganji, S., Ghahramani, M., & Zarei, M. (2009). Prevalence of spinal cord injury in Tehran, Iran. *Journal of Spinal Cord Medicine*, 32(4), 428 - 431.
- Rahman, Z. M. (2013). *Demographic Profile of Spinal Cord Injury: A Retrospective Study*. A dissertation submitted to Bangladesh Health Professions Institute (BHPI), Department of Physiotherapy. CRP, Savar, Dhaka.
- Raichle, K. A., Hanley, M., Jensen, M. P., & Cardenas, D. D. (2007). Cognitions, coping, and social environment predict adjustment to pain in spinal cord injury. *Journal of Pain*, 8(9), 718 - 29.
- Raja, I.A., Vohra, A.H., & Ahmed, M. (2001). Neurotrauma in Pakistan. *World Journal of Surgery* 25(9), 1230 - 1237.

- Rathore, F. A. (2010). Spinal Cord Injuries in the Developing World. International Encyclopedia of Rehabilitation. New York: Center for International Rehabilitation Research Information and Exchange (CIRRIE).
- Rathore, F. A., Farooq, F., Muzammil, S., New, P.W., Ahmad, N., & Haig, A. J. (2008). Spinal cord injury management and rehabilitation: highlights and shortcomings from the 2005 earthquake in Pakistan. *Archives of Physical Medicine and Rehabilitation* 89(3), 579 - 585.
- Rathore, M.F., Farooq, F., Butt, A.W., & Gill, Z.A. (2008). An update on spinal cord injuries in October 2005 earthquake in Pakistan. *Spinal Cord*, 46(6), 461 - 462.
- Rathore, M. F., Hanif, S., Farooq, F., Ahmad, N., & Mansoor, S. N. (2008). Traumatic spinal cord injuries at a tertiary care rehabilitation institute in Pakistan. *Journal of the Pakistan Medical Association*, 58(2), 53 - 57.
- Rathore, M. F., Hanif, S., New, P. W., Butt, A.W., Aasi, M. H., & Khan, S. U. (2008). The prevalence of deep vein thrombosis in a cohort of patients with spinal cord injury following the Pakistan earthquake of October 2005. *Spinal Cord*, 46(7), 523 - 526.
- Revicki, D.A, Osoba, D., Fairclough, D., Barofsky, I., Berzon, R., Leidy, N. K., & Rothman, M. (2000). Recommendations on health-related quality of life research to support labelling and promotional claims in the United States. *Medline*, 9, 887-900.
- Reyes, M. (2005). Women and Spinal Cord Injury. University of Washington Rehabilitation Medicine. http://sci.washington.edu/info/forums/reports/women_sci.asp. Retrieved on 19/06/2015.

- Ross, T.P., Calhoun, E., Cox, T., Kono, W., & Pleasant, M. (2007). The reliability and validity of qualitative scores for the Controlled Oral Word Association Test. *Journal of Clinical Neuropsychology*, 22(4), 475 - 88.
- Roth, E., Davidoff, G., Thomas, P., Doljanac, R., Dijkers, M., Berent, S., Morris, J., & Yarkony, G. (1989). A controlled study of deficits in acute spinal cord injury patients. *Paraplegia*, 27(6), 480-489.
- Saadat, S., Javadi, M., Divshali, B. S., Tavakoli, A. H., Ghodsi, S. M., Montazeri, A., & Rahimi-Movaghar, V. (2010). Health-related quality of life among individuals with long-standing spinal cord injury: a comparative study of veterans and non-veterans. *BMC Public Health*, 10(6), 1-7.
- Saeidiborojeni, H. R., Moradinazar, M., Saeidiborojeni, S., & Ahmadi, A. (2013) A survey on spinal cord injuries resulting from stabbings: a case series study of 12 years' experience. *Journal of Injurious violence*, 5(1), 70 -74.
- Schulz, R., Czaja, S. J, Lustig, A., Zdaniuk, B., Martire, L. M., & Perdomo, D. (2009). Improving the quality of life of caregivers of persons with spinal cord injury: a randomized controlled trial. *Rehabilitation Psychology*, 54(1), 1-15.
- Sekhon, L. H., & Fehlings, M. G. (2001). Epidemiology, demographics, and pathophysiology of acute spinal cord injury. *Spine*, 26, 2-12.
- Semrud-Clikeman, M., & Ellison, P. A.T. (2009). Child Neuropsychology: Assessment and Interventions for Neurodevelopmental Disorders, 2nd Edition. *Springer*, 171.
- Shavelle, R. M., DeVivo, M. J., Paculdo, D. R., Vogel, L. C., & Strauss, D. J. (2007). Long-term survival after childhood spinal cord injury. *Journal of Spinal Cord Medicine*, 30, 48-54.

- Sherer, M. (2014) (Ed). Handbook on the Neuropsychology of Traumatic Brain Injury. Springer, 144.
- Shrestha, D., Garg, M., Singh, G. K., Singh, M. P., & Sharma, U. K. (2007). Cervical spine injuries in a teaching hospital of eastern region of Nepal: A clinico-epidemiological study. *Journal of the Nepal Medical Association*, 46(167), 107 - 111.
- Shwartz, S. H. (1994). Beyond individualism-collectivism: New cultural dimensions of values. In Kim, U., Triandis, H. C., Kagitchubasi, C., Choi, C. & Yoon, G. (Eds.). *Individualism and collectivism: Theory, method and applications* (pp. 85-102). Thousand Oaks, CA: Sage Publications, Inc.
- Skevington, S. M., Lotfy, M. & O'Connell, K. A. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Quality of life Research*, 13(2), 299-310.
- Singh, R., Rohilla, K. R., Siwach, R., Dhankar, S. S., & Kaur, D. A. (2012). Understanding Psycho-Social Issues in Persons with Spinal Cord Injury and Impact of Remedial Measures. *International Journal of Psychosocial Rehabilitation*, 16(1), 95-100.
- Singh, R., Sharma, S. C., Mittal, R., & Sharma, A. (2003). Traumatic spinal cord injuries in Haryana: An epidemiological study. *Indian Journal of Community Medicine* 28(4), 184–186.
- Siosteen, A., Lundquist, C., Blomstrand, C., Sullivan, L., & Sullivan, M. (1990) Sexual ability, activity, attitudes and satisfaction as part of adjustment in spinal cord-injured subjects. *Paraplegia*, 28, 285 - 95.

- Sommer, M. F. (2001). *Spinal cord injury. Functional rehabilitation*. New Jersey: Prentice Hall.
- Stanford, R. E., Soden, R., Bartrop, R., Mikk, M., & Taylor, T. K. F. (2007). Spinal cord and related injuries after attempted suicide: psychiatric diagnosis and long-term follow-up. *Spinal Cord*, 45, 437–443.
- Stensman, R. (1994). Adjustment to traumatic spinal cord injury: A longitudinal study of self-reported quality of life. *Paraplegia*, 32, 416 - 422.
- Stuss, D. T., & Benson, D. F. (1986). *The Frontal Lobes*. Raven Press: New York.
- Stuss, D. T., & Levine, B. (2002). Adult clinical neuropsychology: Lessons from studies of the frontal lobes. *Annual Review of Psychology*, 53, 401 - 433.
- Taber, C., & Venes, W. D. (2009). *Taber's cyclopedic medical dictionary*, 2173-2174. F.A. Davis.
- Thanni, L. O. A., & Kehinde, O. A. (2006). Trauma at a Nigerian Teaching Hospital: Pattern and Documentation of Presentation. *African Health Sciences*, 6, 104 - 107.
- Toe, T. (1978). Spinal injuries in Rangoon, Burma. *Paraplegia* 16(1):118 - 120.
- Tun, C. G., Tun, P.A., & Wingfield, A. (2013). Age differences between younger and elderly adults with long-term spinal cord injury. *Rehabilitation Psychology*, 42(3), 163-182.
- Turgut, M. (2001). Spinal tuberculosis (Pott's disease): Its clinical presentation, surgical management and outcome. A survey study on 694 patients. *Neurosurgical Revue* 24(1), 8 - 13.
- Turnpike, M. (2013). What is Spinal Cord Injury? *National Institute of Neurological Disorders and Stroke Bulletin*.

- Unalan, H., Gençosmanoğlu, B., Akgün, K., Karamehmetoğlu, S., Tuna, H., Ones, K., Rahimpenah, A., Uzun, E., & Tüzün, F. (2001). Quality of life of primary caregivers of spinal cord injury survivors living in the community: controlled study with short form-36 questionnaire. *Spinal Cord*, 39(6), 318-22.
- Vall, J., Braga, V. A., & de Aimeida, P. C. (2006). Study of the quality of life in people with traumatic spinal cord injury. *Archive of Neuropsychiatry*, 64(2B), 451 - 455.
- van Koppenhagen, C. F., Post, M. W., van der Woude, L. H., de Witte, L. P., van Asbeck F.W., de Cieza, A., Kirchberger I., Biering-Sorensen F., Baumberger, M., Charlifue, S., & Post, M. W. (2010). ICF core sets for individuals with spinal cord injury in the long-term context. *Spinal Cord*, 48, 305–312.
- Van Leeuwen, C. M., Kraaijeveld, S., Lindeman, E. & Post, M.W. (2012). Associations between psychological factors and quality of life ratings in persons with spinal cord injury: a systematic review. *Spinal Cord*, 50, 174–187.
- Ventegodt, S., Merrick, J., & Andersen, N. J. (2003). Quality of Life Theory III. Maslow Revisited. *The Scientific World Journal*, 3, 1050–1057.
- Warren, A. M., Pullins, J., & Elliott, T. R. (2008). *Concomitant Cognitive Impairment in Persons with Spinal Cord Injuries in Rehabilitation Settings*. In: Neuropsychology within the Inpatient Rehabilitation Environment. Nova Science Publishers, Inc.
- Weerts, E., & Wyndaele, J. J. (2011). Accessibility to spinal cord injury care worldwide: the need for poverty reduction. *Spinal Cord*, 49(7), 767
- Westie, S. K. (1987). *Clinical Prosthetics and Orthotics*, 11(4), 225-229

- Westie, K., & McKeon, W. (1987). *Multiple-Family Group Psychotherapy in Treatment of Spinal Cord Injury Families*. Paper presented at American Association of SCI Psychologists and Social Workers Convention, Las Vegas, Nevada.
- Whiteneck, G., Meade, M. A., Dijkers, M., Tate, D. G., Bushnik, T. & Forchheimer, M. B. (2004). Environmental factors and their role in participation and life satisfaction after spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 85(11), 1793–1803.
- Wilmot, C. B., D. N. Cope, K. M. Hall, & Acker, M. (1985) "Occult Head Injury: Its Incidence in Spinal Cord Injury," *Archives of Physical Medicine and Rehabilitation*, 66, 227 - 231.
- WHO, (2013). *The World Health Organization Quality of Life (WHOQOL)-BRIEF*. Geneva: WHO
- Wollaars, M. M., Post, M.W., Asbeck, F.W., & Brand, N. (2007). Spinal cord injury pain: the influence of psychologic factors and impact on quality of life. *The Clinical Journal of Pain*, 23(5), 383 - 391.
- Wood-Dauphinée S., & Exner, G. (2005). Quality of life in patients with spinal cord injury basic issues, assessment, and recommendations. *Restorative Neurology and Neuroscience*, 20 (34), 135-49.
- Wyndaele, M., & Wyndaele, J. J. (2006). Incidence, prevalence and epidemiology of spinal cord injury: what learns a worldwide literature survey? *Spinal Cord*, 44(9), 523-529
- Zuur, A. F., Ieno E. N., Walker, N. J., Saveliev, A. A., & Smith, G. M. (2009). *Mixed Effects Models and Extensions in Ecology with R*. Springer: New York

APPENDICES

Research Questionnaires

Section A

BACKGROUND DATA

Age:

Gender: Male () Female ()

Educational level: J.H.S () S.H.S () University () others ()

Diagnosis: Paraplegia () Tetraplegia () Others () Specify

Religion: Christian () Muslim () Others () Specify

Marital Status: Marital Status: Single () Married () Divorced () Others ()
Specify

Section B

Africentric Scale

Please circle the response that best applies to you. Remember there is no right or wrong answer.

SD DA NS AG

SA

- | | | | | | |
|--|---|---|---|---|---|
| 1. I perform better on oral rather than written tasks. | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|

2. When greeting someone, I prefer verbal acknowledgements 1 2 3 4
5

(rather than a nod or hand wave).

3. I feel that sometimes I do things "just because it feels right." 1 2 3 4
5

4. I listen to my inner voice. 1 2 3 4
5

5. I am likely to rely on my inner voice. 1 2 3 4 5

6. I have to see something to believe it. 1 2 3 4 5

7. I can tell when a close friend is in trouble or feels bad. 1 2 3 4 5

8. Attending churches, mosques, or other places of
Worship is important to me. 1 2 3 4 5

9. I meditate and engage in other acts of faith. 1 2 3 4 5

10. I believe in a spiritual force or power. 1 2 3 4 5

11. When stressed, I put my faith in a higher being. 1 2 3 4 5

12. When I hear music I respond actively to it. 1 2 3 4 5

13. When speaking I am likely to use body language
and hand gestures. 1 2 3 4 5

14. I view death as a spiritual event. 1 2 3 4 5

15. When things don't work out, I try to see the positive side. 1 2 3 4 5

16. People should be judged on who they are rather than their
material achievements. 1 2 3 4 5

17. It is expected that the elderly will be cared for by
younger generations. 1 2 3 4 5

18. Older members of my family are relied on for 1 2 3 4 5

advice/guidance.

19. It is not unusual for me to call close family friends **1 2 3 4 5**

"uncle, aunt, etc."

20. The ultimate value of a person is in his/her service to others **1 2 3 4 5**

21. My successful achievements are due to the support of **1 2 3 4 5**

significant others.

22. I usually arrive at meetings, classes, work, etc. before **1 2 3 4 5**

or at the exact specified time.

23. Remembering the past is as important as preparing **1 2 3 4 5**

for the future

Note: SD= Strongly Disagree, DA= Disagree, NS= Not sure, AG= Agree, SA=

Strongly Agree.

Section C

The Cognitive Failures Questionnaire (Broadbent, Cooper, FitzGerald & Parkes, 1982)

The following questions are about minor mistakes which everyone makes from time to time, but some of which happen more often than others. We want to know how often these things have happened to your in the past 6 months. Please circle the appropriate number.

	Very often	Quite often	Occasion- ally	Very rarely	Never
1. Do you read something and find you haven't been thinking about it and must read it again?	4	3	2	1	0

2.	Do you find you forget why you went from one part of the house to the other?	4	3	2	1	0
3.	Do you fail to notice signposts on the road?	4	3	2	1	0
4.	Do you find you confuse right and left when giving directions?	4	3	2	1	0
5.	Do you bump into people?	4	3	2	1	0
6.	Do you find you forget whether you've turned off a light or a fire or locked the door?	4	3	2	1	0
7.	Do you fail to listen to people's names when you are meeting them?	4	3	2	1	0
8.	Do you say something and realize afterwards that it might be taken as insulting?	4	3	2	1	0
9.	Do you fail to hear people speaking to you when you are doing something else?	4	3	2	1	0
10.	Do you lose your temper and regret it?	4	3	2	1	0
11.	Do you leave important letters unanswered for days?	4	3	2	1	0
12.	Do you find you forget which way to turn on a road you know well but rarely use?	4	3	2	1	0
13.	Do you fail to see what you want in a supermarket (although it's there)?	4	3	2	1	0
14.	Do you find yourself suddenly wondering whether you've used a word correctly?	4	3	2	1	0

		Very often	Quite often	Occasion- ally	Very rarely	Never
15.	Do you have trouble making up your mind?	4	3	2	1	0
16.	Do you find you forget appointments?	4	3	2	1	0
17.	Do you forget where you put something like a newspaper or a book?	4	3	2	1	0
18.	Do you find you accidentally throw away the thing you want and keep what you meant to throw away – as in the example of throwing away the matchbox and putting the used match in your pocket?	4	3	2	1	0
19.	Do you daydream when you ought to be listening to something?	4	3	2	1	0
20.	Do you find you forget people's names?	4	3	2	1	0
21.	Do you start doing one thing at home and get distracted into doing something else (unintentionally)?	4	3	2	1	0
22.	Do you find you can't quite remember something although it's "on the tip of your tongue"?	4	3	2	1	0
23.	Do you find you forget what you came to the shops to buy?	4	3	2	1	0
24.	Do you drop things?	4	3	2	1	0
25.	Do you find you can't think of anything to say?	4	3	2	1	0