HEALTH RELATED QUALITY OF LIFE, NEGATIVE EMOTIONAL STATES AND SPIRITUAL WELL-BEING OF CANCER PATIENTS

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DECLARATION

I, H. Lalramliani, declare that the dissertation entitled, "Health related quality of life, negative emotional states and spiritual well-being of cancer patients" hereby submitted to the Mizoram University, for the degree of Master of Philosophy has not previously been submitted by me for a degree at this or any other university; that it is my work in design and execution, and that all material contained herein has been duly acknowledged.

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CERTIFICATE

This is to certify that the present research work entitled, "Health related quality of life, negative emotional states and spiritual well-being of cancer patients" is the original research work carried out by H. Lalramliani under my supervision. The work done is being submitted for the award of the degree of Master of Philosophy in Psychology of the Mizoram University.

This is to further certify that the research conducted by H. Lalramliani has not been submitted in support of an application to this or any other University or an Institute of Learning.

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Cancer is a disease that cannot be cured or adequately treated and that is reasonably expected to result in the death of the patient within a short period of time. There were an estimated 14.1 million cancer cases around the world in 2012, of these 7.4 million cases were in men and 6.7 million in women. This number is expected to increase to 24 million by 2035. This growing cancer burden, within the overall context of non-communicable diseases (NCDs), was a key focus of the UN High Level Meeting on NCDs in 2011 (Rauf, Akhtar, Maghfoor, 2015).

There are different types of terminal illnesses like - cancer, heart failure, chronic lung problems, kidney disease, stroke, AIDS, conditions like Parkinson's disease, the last stages of Alzheimer's and similar conditions. A patient who has such an illness may be referred to as terminally ill patient (Glare et. al., 2003). Cancer is defined as *"*Any of a diverse group of malignant neo plastic disorders characterized by uncontrolled cell growth in various sites throughout the body". It is the second leading cause of death, after heart disease (Jonas, 2005).

According to recent World Health Organization projection, cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death. Cancer is caused by both external factors (tobacco, chemicals, radiation, and infectious organisms) and internal factors (inherited mutations, hormones, immune conditions, and mutations that occur from metabolism). These causal factors may act together or in sequence to initiate or promote carcinogenesis. The development of most cancers requires multiple steps that occur over many years. Certain types of cancer can be prevented by eliminating exposure to tobacco and other factors that initiate or accelerate this process (World Health Organization Statistics, 2007).

The estimated number of new cancers in India per year is about 7 lakhs and over 3.5 lakhs people die of cancer each year. Out of these 7 lakhs new cancers about 2.3 lakhs (33%) cancers are tobacco related. World Health Organization (WHO) says, the estimated cancer deaths in India are projected to increase to 7 lakh in 2015 (NCRP, 2010).

According to the latest report of the Indian Council of Medical Research (ICMR: Three Year Report of Population Base Cancer Registry, 2009-2011) the north-eastern part of India has the highest incidence of cancer in the world. In men, age-adjusted incidence rate of all types of cancers is the highest in Aizawl district of Mizoram followed by East Khasi Hills, Meghalaya and Mizoram state. In women, the highest incidence is in Aizawl district followed by Kamrup urban district, Assam and Mizoram state (NCDIR-NCRP, 2012).

Quality of life (QoL) is a broad multidimensional concept that considers a person's physical, emotional, social, and spiritual well-being (Ferrell & Hassey, 1997). According to the WHO, QoL is defined as individual perception of life, values, objectives, standards, and interests in the framework of culture. QoL is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment (Spilker, 1996). Patients generally instead of measuring lipoprotein level, blood pressure, and the electrocardiogram, make decisions about their health care by means of QoL which estimates the effects on outcomes important to themselves (Oldridge et al., 1998).

In recent years, increasing consideration has been paid to mental health among cancer patients (Aass et al., 1997). The concept of health-related quality of life (HRQOL) covers the patient's perceptions of his or her physical, emotional, social, and cognitive functions and, importantly, disease symptoms and side effects of treatment. Measurement of HRQOL has become better accepted as a way to collect more meaningful data about

cancer patients' subjective experiences on cancer therapy (Broers et al., 2000). At the same, depression and anxiety have become recognized as the most frequent emotional problems in cancer patients (Sellick & Crooks, 1999), with an important impact on HRQOL (Skarstein et al., 2000).

Researchers revealed that few diseases are as strongly affiliated with fear as cancer. The emotional reactions range from moderate worry to disorders that meet the full DSM-IV criteria (Mitchell et al., 2011). They are commonly caused by the severity of physical complaints and not related to neurotic conflicts. Although psychosocial care is becoming more widely available due to higher numbers of specialized cancer centres, the extent of distress is often not identified and therefore not adequately treated (Fallowfield, 2011). This can lead to increased mortality (Hjerl et al., 2003), reduced quality of life (Pelletier et al., 2002), worsening of compliance (Di Matteo et al., 2000) and prolonged hospitalization (Prieto et al., 2002). Underestimation of emotional side effects is caused by deficient training in recognizing distress (Mitchell et al., 2011) and an inability to communicate emotional issues (Pollak et al., 2007), a lack of time for sufficient contact as well as economical and institutional circumstances (Hickie et al., 2001).

Depression is defined as a condition in which a person feels discouraged, sad, hopeless, unmotivated, or disinterested in life in general. When these feelings last for a short period of time, it may be a case of 'the blues'. But when such feelings last for more than two weeks and when the feelings interfere with daily activities such as taking care of family, spending time with friends, or going to work or school, it's likely a major depressive episode. Major depression is a treatable illness that affects the way a person thinks, feels, behaves, and functions. At any point in time, 3 to 5 percent of people suffer from major depression, the lifetime risk is about 17 percent (Barbee, 1998).

According to the American Psychological Association (Kazdin, 2000), anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry. They may also have physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat.

Stress is a fact of nature in which forces from the inside or outside world affect the individual. The individual responds to stress in ways that affect the individual, as well as their environment. Due to the over abundance of stress in our modern lives, we usually think of stress as a negative experience, but from a biological point of view, stress can be a neutral, negative, or positive experience. In general, stress is related to both external and internal factors. External factors include the physical environment, including our job, our relationships with others, our home, and all the situations, challenges, difficulties, and expectations we've confronted with on a daily basis. Internal factors determine our body's ability to respond to, and deal with, the external stress-inducing factors. Internal factors which influence our ability to handle stress include our nutritional status, overall health and fitness levels, emotional well-being, and the amount of sleep and rest we get (Melvin, 2013).

The patients diagnosed with cancer are besieged with negative emotional states with the following symptoms (Fischer & Wedel, 2012):

Depression: Sadness after confrontation with cancer disease or recurrence is adequate. However, clinically significant depression with leading symptoms of depressed mood, loss of interest and anhedonia is often not sufficiently recognized and treated. Depression causes decreased quality of life and affects compliance which possibly leads to adverse process of disease and prolonged hospitalization. Diagnostic criteria

distinguish between depressive reaction within adjustment disorders, major or minor depressive episode, dysthymia and cancer-specific impairments of mood.

Anxiety: Anxiety has cognitive appraisal, affective, behavioral and physiological components, which are sometimes difficult to distinguish from specific side effects of therapy, e.g. nausea. In the context of cancer, anxiety is adaptive and activates resources to avoid danger. Maladaptive anxiety leads to inappropriate thoughts, activities or impairments. Debilitating fear of recurrence, exacerbation of previous anxiety disorder or therapy-induced traumata in acute care like lack of oxygen in lung cancer can lead to maladaptive anxiety. Anxiety can be alleviated through psycho-educative interventions.

Acute stress disorder: The symptoms of crisis (psychological shock, emotional numbing, restriction of consciousness, inability to handle stimuli, vegetative arousal) start within minutes and ease within hours or days.

Posttraumatic stress disorder (PTSD): PTSD is a reaction to a traumatic event of a life-threatening illness such as cancer. Those patients often present very frightened, helpless or horrified state. This category may only be assigned within six months from the appearance of the event and in absence of anxiety or depressive disorders. Three leading symptoms are characteristic: intrusion, avoidance and arousal.

Cancer is a major public health issue and represents a significant economic burden of disease (Brown et al., 2001). Emotional suffering can be brought around by a combination of physical suffering and financial suffering. A terminally ill patient can feel like a failure if they succumb to the pain and show signs of a struggle. All the emotion suffering takes a toll on the physical health of the patient as well. The embarrassment of being unable to take care of oneself also attributes to the depression of the patient. After being self-sufficient for so long, asking for help for simple tasks like using the bathroom

becomes embarrassing. It can even cause the patient to feel even more like a burden to the family. These feelings all contribute to depression and the more depressed the patients are, the less likely they are to feel inclined to live (Emanuel et al., 2011).

Cancer absolutely has emotional roots. Evidences suggested that repressed anger, hate and resentment play a crucial role in the development of cancer. Increased stress hormones caused by emotional triggers suppress the immune system, which can lead to cancer. When negative feelings are not expressed, they can contribute to physical illness over time. Even the conservative Centers for Disease Control and Prevention (CDC, 2000) states that 85 percent of all diseases have an emotional element. Trapped or repressed negative feelings, such as anger, increase a person's level of the stress hormones, which directly suppress the immune system (Artherholt & Fann, 2012).

There are many, diverse descriptions of spirituality. It was reflected in the quality of relationships in up to four areas, that is self, others, environment and or God. Kaiser (2000) refers spirituality to a broad set of principles that transcend all religions. "It is about the relationship between us and something larger. That something can be the good of the community or the people who are served by your agency or school or with energies greater than us. Spirituality means being in the right relationship with all that is. It is a stance of harmlessness toward all living beings and an understanding of their mutual interdependence."

Likewise, Astrow and colleagues (2001) elucidate "Spirituality as the search for transcendent meaning" – can be expressed in religious practice or expressed exclusively in their relationship to nature, music, the arts, a set of philosophical beliefs, or relationships with friends and family".

Spirituality plays an important and relevant role in the provision and receipt of healthcare, particularly at the end of life (Pearce, 2011). Researchers (Astrow et al., 2007; Wilkelman et al., 2011) proposed that most advanced cancer patients have spiritual needs and report that religion becomes more important to them after diagnosis (Balboni et al., 2007). Support of spiritual needs in outpatient medical settings is associated with greater satisfaction and perceived quality of care, less depression (Kristeller et al., 2005), higher quality of life, greater hospice use (Balboni et al., 2010), and decreased medical care costs (Balboni et al., 2011).

Several studies have documented deficits in spiritual care provision for advanced cancer patients. For example, in a sample of 369 cancer outpatients, 73% reported having at least one spiritual need; of these patients, 18% reported that their spiritual needs were not being met. In another sample of 230 advanced cancer outpatients, 72% reported that the medical system supported their spiritual needs minimally or not at all (Balboni et al., 2007).

Many people believe the spiritual dimension is important when a person is coping with serious illness. The ability to find meaning in life can be helpful when dealing with cancer, even though it cannot cure the disease. It may also help us accept illness and death, both for ourselves and for those we love (Benson et al., 2006).

Within each culture, some form of spirituality and prayer has served as the institutionalized means of seeking assistance from a supreme being or beings perceived as powerful enough to alter nature, health, and disease. Different religions hold different beliefs about a supreme being. Today, spirituality is practiced by billions of people throughout the world, both within and outside the framework of formal religion (Breitbart, 2002).

An analysis of 43 studies on people with advanced cancer noted that those who reported spiritual well-being were able to cope more effectively with terminal illnesses and find meaning in their experience. Major themes of spiritual well-being included self-awareness, coping with stress, connectedness with others, faith, empowerment, confidence, and the ability to live with meaning and hope (Lin & Bauer-Wu, 2003).

A more recent study found that spiritual well-being was linked with lower distress levels in people who had been treated for colorectal cancer. The researchers reported that the factors with the strongest link to lower emotional distress were finding peace and meaning in their lives. This result would suggest that spiritual well-being might mean less emotional distress at several stages of cancer (Phelps et al., 2012).

REVIEW OF LITERATURE:

Researchers (Ganz et al., 2002; & Zeltzer et al., 2008), maintained that quality of life may decline considerably during and shortly after active cancer treatment, the majority of disease-free cancer survivors (5 years or more) report a quality of life comparable to those with no history of cancer. Still, many survivors continue to suffer. Individuals who have a history of more invasive and aggressive treatments tend to report poorer functioning and quality of life in the long term. Certain groups, such as racial/ethnic minorities those who were diagnosed at younger ages, and those with lower socioeconomic status, also report greater difficulty regaining quality of life.

Mostly, researchers conclude that Measuring HRQOL can help determine the burden of preventable disease, injuries, and disabilities, and it can provide valuable new insights into the relationships between HRQOL and risk factors. Measuring HRQOL will

help monitor progress in achieving the nation's health objectives. Analysis of HRQOL surveillance data can identify subgroups with relatively poor perceived health and help to guide interventions to improve their situations and avert more serious consequences. Interpretation and publication of these data can help identify needs for health policies and legislation, help to allocate resources based on unmet needs, guide the development of strategic plans, and monitor the effectiveness of broad community interventions. HRQOL assessment is a particularly important public health tool for the elderly in an era when life expectancy is increasing; with the goal of improving the additional years in spite of the cumulative health effects associated with normal aging and pathological disease processes (Centre for Disease Control & Prevention, 2000).

Research findings concluded that pain is one of the most commonly experienced and inadequately treated side-effects of cancer and its treatment (Fairchild, 2010). It is a major concern for women with metastatic breast cancer (MBC; Butler et al., 2003) with 56–68 % of MBC patients reporting severe pain compared to 33 to 52 % of patients with non-metastatic breast cancer (McGuire & Sheidler, 1992).

According to the study of Hofman and colleagues (2007), cancer-related fatigue (CRF) is a common and distressing side-effect of cancer treatment that impacts negatively on patients' quality of life. Up to a third of cancer survivors continue to experience CRF long after completing treatment (Prue et al., 2006); however, the causes of persistent fatigue are not clear. While chemotherapy and radiation therapy are known to cause the fatigue experienced by almost all patients during active treatment, the development of persistent CRF in some cancer survivors is likely to involve complex interactions between biological, psychological, social, and behavioral factors (Bower, 2005).

Cella and colleagues (2001), who reviewed researches in this area, concluded that fatigue is often the first symptom that patients experience and it is usually one of the last to disappear, persisting in 17% of cancer survivors one year after treatment. A recent study also reported that 48.5% of a large sample of cancer patients, half of whom were in follow-up, identified fatigue as a problem. Fatigue was the number one problem identified by this representative group of cancer patients (Carlson et al., 2004).

A relationship between sleep disturbance and fatigue seems logical; as it may be the case that poor sleep leads to increased fatigue. However, some studies have found sleep disturbance to be independent from levels of fatigue (Lavidor, Weller &Babkoff, 2003).

Researches also demonstrates that the emotional systems of anxiety, depression, and anger all have associations with physiological processes relating to cancer symptoms, chemotherapy side effects, and immune function. Yet little is known about how these three emotional systems may uniquely influence specific symptoms or physiological processes during cancer treatment, as studies have tended to focus solely on one emotional system. Research on trait anxiety has revealed associations with higher symptom reports among patients undergoing chemotherapy, with analyses suggesting that the effects are due to a proneness to experience more symptomatic side effects (and potentially due to heightened endocrine reactivity) rather than a bias to over-report symptoms (Leventhal et al., 1996).

According to a study, 66% of patients with major financial challenges suffer depression or anxiety, 29% delay filling prescriptions due to financial pressures, and 22% skip doses of their medications. Sixty-three percent of oncology social workers surveyed said financial issues reduce patients' compliance with their cancer treatment even though

that treatment is the key to their recovery. Additionally, 40% of patients reported depleting their savings, almost 30% reported dealing with bill collectors, and 54% of those handling a major/catastrophic financial burden said it had become more difficult in the past year to afford treatment. Furthermore, 68% of cancer patients and caregivers surveyed reported that the patient is experiencing financial hardship due to medical bills, and 55% of all cancer patients surveyed said the stress of dealing with costs negatively affects their ability to focus on their recovery (Mellace, 2010).

Distress in cancer patients may be difficult to identify because the signs often overlap with the symptoms of the disease and its treatment (e.g., fatigue, changes in appetite, and sleep disruptions). Almost all cancer patients experience some level of distress, ranging from mild, which may be addressed by discussions with the treatment team, to more severe, which should be referred to appropriate supportive services (mental health, social work, and counseling). A recent meta-analysis found that 30% to 40% of cancer patients had diagnosable mood disorders (Curtis, 2008). Research has demonstrated a strong link between distress and physical functioning, and experts in cancer rehabilitation medicine have recommended dual screening for both distress and physical impairments (Disipio, 2013). The early detection and treatment of distress can improve treatment adherence and patient-provider communication and decrease the risk of severe depression or anxiety (Danforth, 2013).

In patients who are physically able, physical activity can hasten recovery from the immediate side effects of treatment and prevent long-term effects, and may reduce the risk of recurrence and increase survival (Courneya, 2003). In observational studies among breast cancer survivors (Irwin & Mayne, 2008), moderate physical activity has been associated with reduced risk of death from all causes (24-67%) and breast cancer (50-53%). Similar benefits have been observed among colon cancer survivors. Intervention

studies have shown that exercise can improve fatigue, anxiety, depression, self-esteem, happiness, and quality of life in cancer survivors (Denlinger & Engstrom, 2011).

Several studies report between 15% and 50% of cancer patients treated with chemotherapy experience mental impairments; however, these problems can also occur in those receiving radiation and surgery without chemotherapy (Vardy & Tannock, 2007). Patients reported rates of mental impairment are higher than those measured objectively (Hutchinson et al., 2012). The assessment of brain function is complicated by both emotional trauma of the cancer diagnosis and treatment-related effects including fatigue, depression, and anxiety, which can also affect cognitive performance, as well as the declines in mental function that typically, accompany age (Ganz, 2012). A recent meta-analysis of breast cancer patients concluded that chemotherapy was associated with small deficits in verbal and spatial abilities that may persist for 6 months or more (Jim et al., 2012). The risk of cognitive impairment from chemotherapy increases with advanced age, lower pretreatment IQ, and those with a genetic variant that is associated with Alzheimer's disease (Ahles, 2004; Small et al., 2011).

The spiritual nature of individuals needs to be differentiated from the religious aspects of an individual's life (Mansen, 1993). Spirituality is a broader term and may be viewed as an umbrella concept under which one finds religion. Religiosity is an expression of one's spiritual perspective and refers to an external, formal system of beliefs, values, rules of conduct, and rituals (Heriot, 1992; Mickley, Soeken & Belcher, 1992). Research supports religion (an expression of a person's spiritual perspective) as a primary means of coping with stress of illness and disability (Kaye & Robinson, 1994; Wykle & Segal, 1991).

Religious coping may influence quality of life, in a multi-institutional cross-sectional study of 170 patients with advanced cancer, more use of positive religious coping methods (such as benevolent religious appraisals) was associated with better overall quality of life and higher scores on the existential and support domains of the McGill Quality of Life Questionnaire. In contrast, more use of negative religious coping methods (such as anger at God) was related to poorer overall quality of life and lower scores on the existential and psychological domains (Tarakeshwar et al., 2006).

Findings demonstrate that spirituality is one of the most vital resources employed by survivors of cancer to cope with the illness and its treatment. In patients with cancer, 70–90 % reports that either religion or spirituality or both is important to them (Balboni et al., 2007; Johnson & Spilka,1991), and 30–60 % report increases in the significance of spirituality or in spiritual activities as a result of their illness (Brady et al., 1999).

The importance of spirituality as a central component of psychological well-being is increasingly recognized by doctors and mental-health professionals (Brady et al., 1999). Among the medically and terminally ill in particular, patients struggle with questions about their mortality, the meaning and purpose of life, and whether a greater power exists, forcing them to grapple with issues they had previously ignored. Kearney and Mount (2000) stated that spiritual issues "lie at the very centre of the existential crisis that is terminal illness". Spirituality is perhaps best defined as "the way in which people understand their lives in view of their ultimate meaning and value". Many patients turn to religion for answers to these difficult questions, but others find support through their spiritual beliefs outside the context of organized religion (Muldoon, 1995).

Cancer is a common household word, with each of us closely associated with at least one near and dear one, a family member or a friend, a neighbor or a colleague, diagnosed with cancer. In India there is also a perception that cancer incidents is on the increase and a hope that perhaps with the advances in technology, cancer is diagnosed more frequently, maybe a change in our attitude and approach. The myths associated with cancer are vanishing and we are more open to accepting cancer diagnosis and discussing cancer more openly (Farley et al., 2014).

Cancer is becoming the devastating disease of all at present now. It is the most important public health burden around the Globe. Global burden of Cancer incidence is continuously increasing and increasing. As per the GLOBOCAN 2008 estimates, about 12.7 million cancer cases and 7.6 million cancer deaths are estimated to have occurred in 2008 (Jemal et al., 2011). According to World Cancer Report 2008, by the year 2030 the global burden of cancer will increase to 26.0 million with 17.0 million deaths (with 1% annual increase in rates compared to 2008). The most common cancers in the world in term of incidence were lung (1.52 million cases), breast (1.29 million) and colorectal (1.15 million). Lung cancer was the most common cause of death (1.31 million), followed by stomach cancer (780,000 deaths) and liver cancer (699,000 deaths) (World Cancer Report, 2008).

As estimated, the burden of cancer cases for India in the year 2020 will be 11,48,757 (male 5,34,353; Female 6,14,404) compared to 9,79,786 in 2010 (Takiar et al., 2011). In India, the International Agency for Research on Cancer estimated indirectly that about 6,35,000 people died from cancer in 2008, representing about 8% of all estimated global cancer deaths and about 6% of all deaths in India (Dikshit et al., 2012). In India carcinoma of lung was responsible for maximum death in men (Ferlay et al., 2007).

According to the Indian Council for Medical Research, Aizawl district, which includes the state capital, has the highest incidence of cancer in India, while Mizoram as a state stands third. There are 273.5 cancer cases for every 1 lakh residents of Aizawl district, which has a population of 4 lakh, according to the 2011 Census. Mizoram as a state, with a population just below 11 lakh, comes third with 189.5 cancer cases for every 1 lakh people. Stomach cancer is the most common form of cancer here, with Aizawl district leading the list, Mizoram as a state coming second and Mizoram as a state, excluding Aizawl district, coming third. Other prevalent forms of cancer include cancers of the oesophagus, the hypopharynx, cervix and breasts (ICMR, 2009-2012).

The Aizawl district also has the highest incidence of lung cancer among both men and women, and as a state Mizoram ranks second. Experts suggest the main reason behind this is tobacco consumption; a majority of both men and women have tobacco habits (ICMR, 2009-2012). It is known that most patients, families, and caregivers face some degree of depression, anxiety, and fear when cancer becomes part of their lives. These feelings are normal responses to this life-changing experience. In people with cancer, these feelings may be caused by many things, including changes in how they are able to fill family or work roles. A person with cancer could feel the loss of control over life events, and have to deal with changes in body image. They could feel grief at the losses and changes in their lives that cancer brings. They might fear death, suffering, pain, or all the unknown things that lie ahead.

The risk for developing a depressive disorder or experiencing distressing symptoms of depression for people with cancer is even greater than for the general public (Van't et al., 1980). At many different times during their treatment and recovery, people with cancer may be fearful and anxious. For most people with cancer, finding out that they have cancer or that the cancer came back causes the most anxiety and fear. Fear of

treatment, doctor visits, and tests might also cause apprehension - the feeling that something bad is going to happen (The American Cancer Society, 2012).

According to the National Cancer Comprehensive Network (2013), cancer-related distress has been defined as a multi factorial, unpleasant emotional experience that may interfere with the ability to cope effectively with cancer and its treatment. Distress in cancer patients may be difficult to identify because the signs often overlap with the symptoms of disease and treatment (e.g., fatigue, changes in appetite, and sleep disruptions). Almost all cancer patients experience some level of distress, ranging from mild, which may be addressed by discussions with the treatment team, to more severe, which should be referred to appropriate supportive services (mental health, social work, and counseling).

Religion and spirituality have been shown to be significantly associated with measures of adjustment and with the management of symptoms in cancer patients. Religious and spiritual coping have been associated with lower levels of patient discomfort as well as reduced hostility, anxiety, and social isolation in cancer patients (Acklin et al., 1983; Kaczorowski, 1989; McCullough, et al., 2000; Janiszewska et al., 2008) and in family caregivers (Kim et al., 2007). Specific characteristics of strong religious beliefs, including hope, optimism, freedom from regret, and life satisfaction, have also been associated with improved adjustment in individuals diagnosed with cancer (Weisman, Worden, 1996; Pargament, 1997).

Spirituality and religiosity may be two specific resources that are associated with lower rates of depression, and may help men with prostate cancer more effectively manage their distress. Spirituality may be a useful coping mechanism as men with prostate cancer deal with the existential issues that accompany this disease. In fact,

spirituality has been identified as a potential mediator of psychological distress among patients with advanced cancer and AIDS (Clain et al., 2003). Since older men tend to underutilize mental health services, spirituality may further serve as a means of informal support for them (Klap et al., 2002).

In view of the foregoing, the study shall attempt to highlight the relationships between health related quality of life, negative emotional states and spiritual well-being of cancer patients in Aizawl, the capital city of Mizoram. The study is also designed to compare the cancer patients with the control group and between 'Sex' (male and female) on the behavioral measures. Accordingly, the proposed study is designed with the objectives presented as under.

Objectives:

In view of the foregoing empirical findings and theoretical considerations, the study is designed with the following objectives:

1. To study the impact of 'Treatment' (cancer patients and control group) on health related quality of life, negative emotional states and spiritual well-being.
2. To study the impact of 'Sex' (male and female) on health related quality of life, negative emotional states and spiritual well-being.
3. To determine the predictability of health related quality of life from negative emotional states and spiritual well-being.
4. To elucidate the role of other demographic variables (age, occupational status, educational qualification, marital status, socioeconomic status, number of family members, number of children, number of siblings, birth order, breadwinner, number of bread earners and monthly family income) in the prediction of health related quality of life from negative emotional states and spiritual well-being.

Hypothesis:

To meet the target objectives the following hypotheses are set forth for the study:

1. The control group as compared to the cancer patients is expected to show greater scores on health related quality of life and spiritual well-being, and the reverse is expected on the negative emotional states.

2. Male and female participants are expected to be more or less equal on health related quality of life and spiritual well-being, while females as compared to males are expected to show greater scores on negative emotional states.

3. It was expected that health related quality of life will be predictable from negative emotional states and spiritual well-being.

4. The demographic variables (age, occupational status, educational qualification, marital status, socioeconomic status, number of family members, number of children, number of siblings, birth order, breadwinner, number of bread earners and monthly family income) would play significant role in the prediction of health related quality of life from negative emotional states and spiritual well-being.

Sample:

The participants (cancer patients) between 40 and 65 years of age were selected from Mizoram State Cancer Institute and different localities of Aizawl, by following purposive sampling. The sample for the control group was selected based on multistage sampling procedure from Aizawl, the capital city of Mizoram, following the target objective of the study. The sampling frame for the control group of participants incorporated the basic demographic variables to maintain the homogeneity of the participants under study.

Thus, the 150 cancer patients and 161 control participants in the middle adulthood (Erikson, 1968) with proportionate representation of 'sex' (170 male and 141 female), matched or equated on the demographic variables of age, occupational status, educational qualification, marital status, socioeconomic status, number of family members, number of children, number of siblings, birth order, breadwinner, number of bread earners and monthly family income, served as participants for the study.

Design of the study:

The study employed 2 'treatment' (cancer patients & control group) x 2 'sex' (male & female) factorial design. The sample characteristic table (Table-1) portrays the 2x2 factorial design to be imposed on the health related quality of life, negative emotional states and spiritual well-being.

Table-1: The Sample Characteristic Table for the 2 Treatment x 2 Sex factorial design of the study.

	Male	**Female**	**Total**
Treatment Group	90	60	150
Control Group	80	81	161
Total	170	141	311

Procedure:

The participants (150 cancer patient and 161 control group) were identified following the purposive and multistage sampling procedure. Rapport was formed with each of the participants at the individual level and the consent for participation obtained with initial briefing and the explanation of requirements for the psychological task. The importance of the instructions relating to the psychological measures was clearly highlighted along with the conditional time frame permitted for completion of the psychological task. The first phase of interaction was followed by data collection, the later was followed by introspective report and debriefing.

Each participant received a booklet containing the demographic information (age, educational qualification, and socioeconomic status, number of children, family size, family type and breadwinner), RAND-36 (Research and Development; Measure of Health-Related Quality of Life (Hays & Morales, 2001) Depression Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) and Spiritual Health and Life Orientation

Measure (SHALOM; Fisher, 2010). During the course of the data collection, there were approximately 500 booklets distributed and handed out, face to face interviewed was conducted with most of the participants. However, in the final count only 311 participants completed the demographic information and the psychological measures.

Statistical Analyses:

The responses of the participants after careful screening, cleaning and coding are processed with statistical packages. However, the assumptions of normality and homogeneity of variance was violated by the data set. Therefore, a non-parametric comparison of the 2 treatment (cancer patients & control group) X 2 sex (male & female) factorial design was employed.

Firstly, U-test was employed to compare the treatment with the control group as well as the male & female on health conditions, negative emotional states & spiritual well-being. Secondly, Kruskal Wallis one way analysis of variance was employed to compare the participants under four cells of the 2 treatment (cancer patients & control group) X 2 sex (male & female) factorial design. Thirdly, Steel-Dwass test which is a non-parametric Post-hoc multiple comparison was employ to discern the patterns of differences under the four cells of the 2 treatment (cancer patients & control group) X 2 sex (male & female) factorial design for the significant Kruskal Wallis one way analysis of variance.

Finally, series of binary logistic regression in the prediction of each of the individual health related quality of life (physical functioning, physical role limitation, emotional role limitation, energy/fatigue, emotional well-being, social functioning, pain & general health) from the demographic variables (sample, sex, age, occupational status, educational qualification, marital status, number of family members, number of children,

number of siblings, birth order, bread winner, number of bread earners and monthly family income) all of which are entered as the predictors in Block-1; the negative emotional states (depression, anxiety and stress) all added as a predictors in Block-2; and the sub-scales of spiritual well-being (personal, communal, environmental and transcendental) are finally added as predictors in Block-3.

Psychological tools:

RAND-36 Measure of Health-Related Quality of Life (Hays & Morales, 2001): RAND is a 36-item health survey that taps eight health concepts in the past four weeks on the: physical functioning (α=.95), bodily pain (α=.81), role limitations due to physical health problems, role limitations (α=.89) due to personal or emotional problems, emotional well-being (α=.68), social functioning (α=.58), energy/fatigue (α=.66) and general health (α=.75) perceptions.

Depression Anxiety and Stress Scale (DASS: Lovibond&Lovibond, 1995): The DASS is a 21-item scale which includes three self-report scales designed to measure the negative emotional states of depression (α=.82), anxiety (α=.62) and stress (α=.75). Respondents are experienced each state over the past week. Using the 0-4 scale, indicate the subject's agreement with each item by placing the appropriate number on the line preceding that item. The 4-point scale is: 0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree, or a good part of time, 3 = applied to me very much, or most of the time.

Spiritual Health and Life Orientation Measure (SHALOM); Fisher, (1998 & 2010): SHALOM comprises 20 items distributed in four domains of Spiritual Well-being (SWB), with 'sense of identity, self-awareness, joy in life, inner peace, meaning in life' reflecting Personal SWB (α=.86); 'love of other people, forgiveness toward others, trust

between individuals, respect for others, kindness toward other people' reflecting Communal SWB (α=.72); 'connection with nature, awe at a breathtaking view, oneness with nature, harmony in the environment, sense of 'magic' in the environment' reflecting Environmental SWB (α=.68); 'personal relation with the Divine/God, worship of the Creator, oneness with God, peace with God, prayer life' reflecting Transcendental SWB (α=.86). Two responses were sought to each item, both using a 5-point Likert scale, to indicate *i) how important you think each area is for an ideal state of spiritual well-being,* and *ii) how you feel each item reflects your personal experience most of the time.*

During the study periods, 40 patients were admitted in the hospital, of these 4 patients were found to be with severe cognitive impairment and other 5 were ineligible to participate because of serious illness. The outpatients give consent to participate in the study, however, 20 were excluded from these analyses because of missing or incomplete data on one more of the study measures from the control group participants.

Of the 311 study participants 141 were women and 170 were male. The entire treatment group participants were diagnosed with cancer, with the most typical diagnoses in male is stomach, oesophagus, lung, hypopharynx and liver. The leading cancer sites among females are lung, stomach, cervix uteri, breast and oesophagus. In view of the records maintained by the ICMR, the respective Crude Rate and Age Adjusted Rate per 1,00,000 population for the sites were lung, stomach, cervix uteri, breast and oesophagus.

Table 2: The bivariate correlation matrix of the demographic variables and the psychological measures.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Treatment																											
2. Sex	.10																										
3. Age	-.15**	-.14*																									
4. Occupational Status	.24**	-.28**	.06																								
5. Educational Qualification	-.44**	.17**	.38**	-.58**																							
6. Breadwinner	.15**	-.27**	-.08	.49**	-.37**																						
7. Number of Bread earners	.46**	.08	-.04	.13*	.17**	-.00																					
8. Monthly Family Income	.46**	-.11	-.06	.50**	.56**	-.16**	.46**																				
9. Marital Status	-.07	.22**	.29**	-.11	-.29**	.07	-.08	-.15**																			
10. Number of Family Members	.07	-.05	.00	.06	.08	.19**	.40**	.32**	-.06																		
11. Number of Children	-.14*	.00	.45**	-.14*	-.37**	.17**	.05	-.09	.22**	.33**																	
12. Number of Siblings	.03	-.01	.17**	-.08	-.16**	.02	.10	-.00	.06	.11*	.22**																
13. Birth Order	.04	.04	.05	-.05	-.08	.05	.11*	.01	.02	.09	.13*	.63**															
14. Physical Functioning	.72**	-.05	-.22**	.25**	.45**	-.19**	.33**	.35**	-.09	.06	-.18**	.05	.06														
15. Physical Role Limitation	.55**	-.04	-.28**	.23**	.46**	-.20**	.27**	.35**	-.13*	.09	-.20**	.00	-.02	.66**													
16. Emotional Role Limitation	.38**	-.07	-.21**	.24**	.39**	-.19**	.23**	.31**	-.09	.09	-.19**	.04	-.01	.51**	.81**												
17. Energy/Fatigue	.11	-.12*	-.02	.09	.08	-.14*	.04	.04	-.07	.04	-.03	.04	.03	.35**	.29**	.25**											
18. Emotional Well-being	-.00	-.17**	.09	.10	.05	-.18**	.02	.04	-.03	.06	.02	.06	.05	.18**	.13*	.14*	.59**										
19. Social Functioning	.04	-.07	-.01	.09	.05	-.23**	.02	-.04	-.04	-.05	-.03	.08	.00	.29**	.21**	.21**	.54**	.54**									
20. Pain	.46**	.01	-.05	.21**	.30**	-.19**	.24**	.23**	-.08	.03	-.10	.06	.03	.57**	.48**	.39**	.43**	.27**	.32**								
21. General Health	.62**	-.07	-.17**	.29**	.42**	-.24**	.29**	.34**	-.10	.07	-.15**	.02	.04	.67**	.55**	.39**	.45**	.26**	.38**	.63**							
22. Depression	.13*	.18**	-.05	-.04	-.03	.09	.06	.00	.06	-.00	.03	.03	.05	-.05	-.13*	-.18**	-.48**	-.58**	-.46**	-.21**	-.19**						
23. Anxiety	-.03	.19**	-.02	-.09	-.08	.12*	.01	-.05	.11	.00	.04	-.01	.05	-.17**	-.16**	-.18**	-.40**	-.46**	-.42**	-.27**	-.24**	.63**					
24. Stress	.29**	.23**	-.11	.06	.11	.04	.16**	.14*	.05	.06	.01	.02	.09	.08	.00	-.09	-.36**	-.51**	-.41**	-.11	.02	.71**	.59**				
25. Personal SWB	-.50**	-.04	.14*	-.08	-.24**	-.06	-.22**	-.20**	.04	-.03	.08	.12*	.07	-.28**	-.24**	-.17**	.21**	.29**	.19**	-.19**	-.19**	-.28**	-.18**	-.31**			
26. Communal SWB	-.51**	-.01	.02	-.13*	-.22**	.04	-.30**	-.26**	.05	-.09	-.01	.07	.06	-.32**	-.27**	-.21**	.09	.15**	.03	-.22**	-.29**	-.19**	-.09	-.28**	.65**		
27. Environmental SWB	-.37**	.05	.11*	-.06	-.19**	-.02	-.18**	-.23**	.02	-.04	.09	.08	.05	-.27**	-.19**	-.17**	.22**	.27**	.17**	-.12*	-.15**	-.19**	-.12*	-.23**	.67**	.58**	
28. Transcendental SWB	-.42**	.13*	.14*	-.03	-.19**	.07	-.24**	-.14*	.05	-.05	.06	.01	-.01	-.32**	-.22**	-.18**	.08	.13*	.01	-.21**	-.24**	-.18**	-.07	-.17**	.73**	.60**	.59**

**Significant at .01; * Significant at .05

The correlation matrix shows that 'Treatment' is positively correlated with occupational status, educational qualification, number of bread earners, monthly income, physical functioning, emotional role limitation, pain, general health, depression and stress; whereas age, bread winner, number of children, personal, communal, environmental and transcendental spiritual well-being show negative correlation. 'Sex'shows positive correlation with marital status, depression, anxiety, stress and transcendental spiritual well-being and negatively correlated with occupational status, with educational qualification, energy fatigue, emotional well-being, depression, anxiety and stress. The correlation also revealed age to be positively correlated with marital status, number of children, number of siblings, personal, environmental and transcendental spiritual well-being and negatively correlated with educational qualification, physical functioning, physical role limitation, emotional role limitation and general health.

Educational qualification, monthly income, physical functioning, physical role limitation, emotional role limitation, pain and general health shows positive correlation with occupation and negative correlation with bread winner, number of children and communal spiritual well-being. Educational qualification has a positive correlated with bread earners, monthly income, physical functioning, physical role limitation, emotional role limitation, pain and general health and negatively correlation with bread winner, marital status, number of children, number of siblings, personal, communal, environmental and transcendental spiritual well-being and.

Bread winner has positive correlation with number of family members, number of children and anxiety and negative correlation with monthly income, physical functioning, physical role limitation, emotional role limitation, energy/fatigue, emotional well-being, social functioning, pain and general health. Number of Bread earners is also positively correlated with monthly income, number of family members, birth order, physical

functioning, physical role limitation, emotional role limitation, general health and stress and negative correlation with personal, communal, environmental and transcendental spiritual well-being. Monthly income has positive correlation with number of family members, physical functioning, physical role limitation, emotional role limitation, pain, general health and stress but negatively correlated with personal, communal, environmental and transcendental spiritual well-being.

Marital status shows positive correlation between number of children and negative correlation with physical role limitation. Number of family members is positively correlated with number of children and number of siblings. Number of children has positive correlation with number of siblings and birth order whereas, physical functioning, physical role limitation, emotional role limitation and general health has negative correlation. Number of siblings emerged to be positively correlated with birth order and personal spiritual well-being and there is no negative correlation in the matrix.

The sub-scales of RAND show significant positive relationship in all possible combination. Similarly, depression, anxiety and stress and the sub-scales of spiritual well-being show significant positive relationship in all possible combinations. In addition, depression and anxiety show negative relationship with all the sub-scales of RAND except for that between depression and physical functioning. Stress shows negative relationship with energy/fatigue, emotional well-being and social functioning.

The physical functioning, physical role limitation, emotional role limitation, pain and general health show negative relationship with all the sub-scales of spiritual well-being. Energy/fatigue, emotional well-being and social functioning show positive relationship with all the sub-scales of spiritual well-being except for that between energy/fatigue and social functioning with that of communal and transcendental spiritual well-being.

Depression, anxiety and stress show negative relationship with all the sub-scales of spiritual well-being except for that between anxiety with communal and transcendental spiritual well-being.

Table-3: The mean ranks and sum of ranks for the treatment group and control group on health related quality of life, negative emotional states and spiritual well-being.

	Treatment Group		**Control Group**	
	Mean Ranks	**Sum of Ranks**	**Mean Ranks**	**Sum of Ranks**
Physical Functioning	91.06	13659.50	216.50	34856.50
Physical Role Limitation	107.78	16166.50	200.93	32349.50
Emotional Role Limitation	127.75	19163.00	182.32	29353.00
Energy/Fatigue	147.37	22105.00	164.04	26411.00
Emotional Well-being	156.74	23511.00	155.31	25005.00
Social Functioning	154.92	23237.50	157.01	25278.50
Pain	113.89	17083.50	195.23	31432.50
General Health	99.47	14921.00	208.66	33595.00
Depression	145.58	21837.00	165.71	26679.00
Anxiety	158.36	23753.50	153.80	24762.50
Stress	128.97	19345.50	181.18	29170.50
Personal SWB	203.39	30508.00	111.85	18008.00
Communal SWB	203.17	30475.00	112.06	18041.00
Environmental SWB	193.12	28968.50	121.41	19547.50
Transcendental SWB	194.85	29228.00	119.80	19288.00

The result (Table-3) highlighted the mean ranks and sum of ranks for the treatment and control group on health related quality of life, negative emotional states and spiritual well-being. The Mann Whitney U-test (Table-4) revealed significant effect of ‘treatment’ on: physical functioning, physical role limitation, emotional role limitation, pain and general health of the health conditions; and the personal, communal, environmental and transcendental spiritual well-being.

The perusal of results (Table-3) revealed significantly greater mean ranks for the control group as compared to the treatment group on physical functioning, physical role limitation, emotional role limitation, pain, general health and stress; whereas, greater mean ranks emerge for the treatment group as compared to control group on personal, communal, environmental and transcendental spiritual well-being.

Table-4: The result of the Mann-Whitney U-test for the effect of 'Treatment' on health related quality of life, negative emotional states and spiritual well-being.

	Mann-Whitney U	**Wilcoxon W**	**Z**	**Sig. (2-tailed)**
Physical Functioning	2334.50	13659.50	-12.32	.00
Physical Role Limitation	4841.50	16166.50	-9.88	.00
Emotional Role Limitation	7838.00	19163.00	-5.64	.00
Energy/Fatigue	10780.00	22105.00	-1.65	.10
Emotional Well-being	11964.00	25005.00	-.14	.89
Social Functioning	11912.50	23237.50	-.21	.83
Pain	5758.50	17083.50	-8.04	.00
General Health	3596.00	14921.00	-10.78	.00
Depression	10512.00	21837.00	-2.00	.05
Anxiety	11721.50	24762.50	-.46	.64
Stress	8020.50	19345.50	-5.16	.00
Personal SWB	4967.00	18008.00	-9.01	.00
Communal SWB	5000.00	18041.00	-8.98	.00
Environmental SWB	6506.50	19547.50	-7.07	.00
Transcendental SWB	6247.00	19288.00	-7.39	.00

The result (Table-5) highlighted the mean ranks and sum of ranks for the male and female participants on the health related quality of life, negative emotional states and spiritual well-being. The Mann-Whitney U-test (Table-6) revealed the significant effect of 'Sex' on health Energy/fatigue, emotional well-being, social functioning, depression, anxiety, stress and transcendental spiritual well-being.

The results (Table-5) also revealed greater mean ranks for males as compared to females on energy/fatigue, emotional well-being and social functioning, whereas the reversed was observed on depression, anxiety, stress and transcendental spiritual well-being.

Table-5: The mean ranks and sum of ranks for 'Sex' (male and female) participants on health related quality of life, negative emotional states and spiritual well-being.

	Male		Female	
	Mean Ranks	**Sum of Ranks**	**Mean Ranks**	**Sum of Ranks**
Physical Functioning	160.41	27269.50	150.68	21246.50
Physical Role Limitation	158.46	26939.00	153.03	21577.00
Emotional Role Limitation	161.78	27502.00	149.04	21014.00
Energy/Fatigue	169.11	28748.50	140.20	19767.50
Emotional Well-being	168.60	28661.50	140.81	19854.50
Social Functioning	165.19	28082.00	144.92	20434.00
Pain	155.21	26385.00	156.96	22131.00
General Health	162.62	27645.00	148.02	20871.00
Depression	142.88	24290.00	171.82	24226.00
Anxiety	139.64	23738.00	175.73	24778.00
Stress	136.55	23213.50	179.45	25302.50
Personal SWB	159.77	27161.00	151.45	21355.00
Communal SWB	156.15	26545.00	155.82	21971.00
Environmental SWB	152.01	25841.50	160.81	22674.50
Transcendental SWB	145.89	24802.00	168.18	23714.00

Table-6: The result of the Mann-Whitney U-test for the effect of 'Sex' on health related quality of life, negative emotional states and spiritual well-being.

	Mann-Whitney U	**Wilcoxon W**	**Z**	**Sig. (2-tailed)**
Physical Functioning	11235.50	21246.50	-.95	.34
Physical Role Limitation	11566.00	21577.00	-.57	.57
Emotional Role Limitation	11003.00	21014.00	-1.31	.19
Energy/Fatigue	9756.50	19767.50	-2.85	.00
Emotional Well-being	9843.50	19854.50	-2.73	.01
Social Functioning	10423.00	20434.00	-2.02	.04
Pain	11850.00	26385.00	-.17	.86
General Health	10860.00	20871.00	-1.44	.15
Depression	9755.00	24290.00	-2.86	.00
Anxiety	9203.00	23738.00	-3.66	.00
Stress	8678.50	23213.50	-4.22	.00
Personal SWB	11344.00	21355.00	-.82	.41
Communal SWB	11960.00	21971.00	-.03	.97
Environmental SWB	11306.50	25841.50	-.87	.39
Transcendental SWB	10267.00	24802.00	-2.19	.03

Table-7: The mean ranks the participants under the four cells of the 2 x 2 factorial design on health related quality of life, negative emotional states and spiritual well-being.

	Treatment		Control	
	Male	**Female**	**Male**	**Female**
Physical Functioning	96.32	83.18	232.51	200.69
Physical Role Limitation	111.04	102.88	211.81	190.18
Emotional Role Limitation	129.58	125.01	197.99	166.83
Energy/Fatigue	148.85	145.14	191.90	136.53
Emotional Well-being	165.29	143.92	172.32	138.51
Social Functioning	164.52	140.52	165.94	148.19
Pain	106.78	124.56	209.69	180.96
General Health	108.56	85.84	223.43	194.08
Depression	132.12	165.78	154.99	176.29
Anxiety	145.24	178.03	133.33	174.03
Stress	114.85	150.15	160.96	201.15
Personal SWB	203.27	203.56	110.83	112.86
Communal SWB	197.73	211.33	109.37	114.71
Environmental SWB	187.90	200.96	111.63	131.07
Transcendental SWB	182.48	213.42	104.74	134.68

The results (Table-7) portray the mean ranks of the participants under the four cells of the 2 treatment (cancer patients & control group) x 2 sex (male & female) factorial design on health conditions, negative emotional states and spiritual well-being.

Table-8: The result of the Kruskal-Wallis one-way analysis of variance for effect of the 2 ‘treatment’ x 2 ‘sex’ factorial design on health related quality of life, negative emotional states and spiritual well-being.

	Chi-Square	**df**	**Sig.**
Physical Functioning	157.61	3	.00
Physical Role Limitation	100.70	3	.00
Emotional Role Limitation	37.28	3	.00
Energy/Fatigue	18.33	3	.00
Emotional Well-being	7.82	3	.05
Social Functioning	4.34	3	.23
Pain	70.23	3	.00
General Health	122.92	3	.00
Depression	11.46	3	.01
Anxiety	14.28	3	.00
Stress	40.41	3	.00
Personal SWB	81.28	3	.00
Communal SWB	81.60	3	.00
Environmental SWB	52.73	3	.00
Transcendental SWB	63.41	3	.00

The result of the Kruskal-Wallis one-way analyses of variance ranks for the effect of the 2 'treatment' (cancer patients & control group) x 2 'sex' (male & female) factorial design on health related quality of life, negative emotional states and spiritual well-being is presented in Table-8. The results (Table-8) revealed significant effect of the 2 'treatment' (cancer patients & control group) x 2 'sex' (male & female) factorial design on physical functioning, emotional role limitation, energy/fatigue, pain, general health, depression, anxiety, stress, personal, communal, environmental and transcendental spiritual well-being.

Table-9: The result of the post-hoc multiple comparisions (Steele-Dwass test) for the significant effect of the 2 'treatment' x 2 'sex' on the health related quality of life.

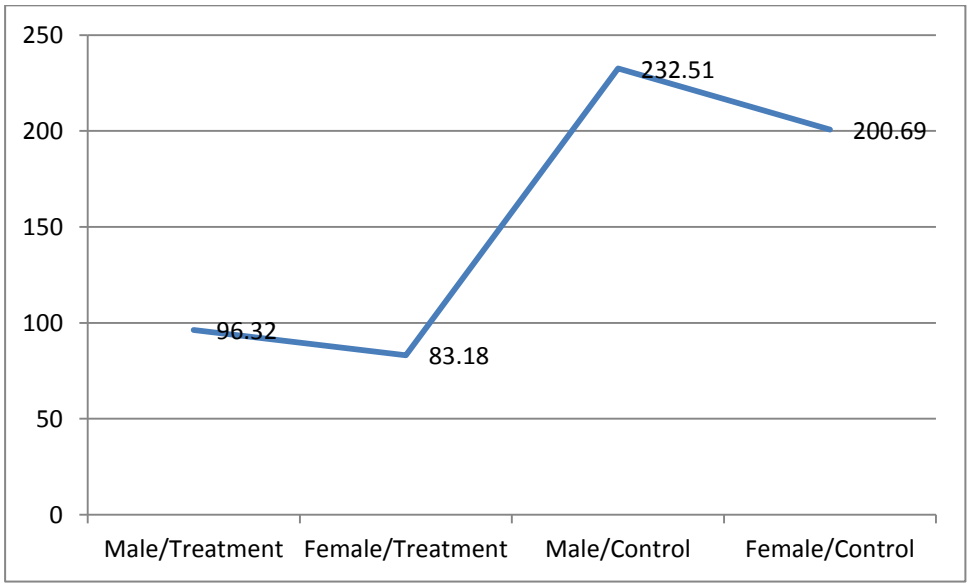
Behavioral Measures	Mean Ranks	Male/ Treatment	Female/ Treatment	Male/ Control	Female/ Control
Physical Functioning	96.32	X	0.92	-9.20**	-8.28**
	83.18		X	-8.87**	-8.51**
	232.51			X	3.68**
	200.69				X
Physical Role Limitation	111.04	X	0.95	-7.73**	-6.54**
	102.88		X	-7.29**	-6.33**
	211.81			X	1.98
	190.18				X
Emotional Role Limitation	129.58	X	0.29	-5.29**	-2.75*
	125.01		X	-5.14**	-2.81*
	197.99			X	2.15
	166.83				X
Energy/Fatigue	148.85	X	0.15	-2.81*	0.66
	145.14		X	-2.87*	0.27
	191.90			X	4.48**
	136.53				X
Pain	106.78	X	-1.13	-7.28**	-5.68**
	124.56		X	-5.41**	-3.85**
	209.69			X	2.49
	180.96				X
General Health	108.56	X	1.34	-8.04**	-6.42**
	85.84		X	-8.77**	-7.56**
	223.43			X	2.67*
	194.08				X

*** Significant at .01 level; * Significant at .05 level.*

The significant interaction effect of 'Treatment x Sex' on physical functioning, physical role limitation, emotional role limitation, energy/fatigue, pain and general health emerges due to the dominant influence of Treatment. However, females as compared to males show greater mean score on physical functioning, energy/fatigue and general health.

Mixed patterns of significant mean differences emerges in the analyses for "Treatment x Sex' on depression, anxiety and stress. Female control is greater than male in depression, and again female control is greater than all others in stress and male control is greater than male treatment. Treatment shows greater in personal, communal, environmental and transcendental spiritual well-being.

Figure-1: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on physical functioning.



The result of the post-hoc multiple comparision (Steel-Dwass test) for the significant effect of the 2 'treatment' (cancer patients & control group) x 2 'sex' (male & female) factorial design on the health related quality of life is presented in Table-9. The results (Table-9 & Figure-1 to 6) revealed significantly greater mean ranks for the: male and female belonging to the control group as compared to those in the treatment group on physical

functioning, physical role limitation, emotional role limitation, pain and general health; the male in the control group as compared to the male and female in the treatment group on energy/fatigue; and the male in the control group as compared to the female in the control group on physical functioning, energy/fatigue and general health.

Figure-2: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on physical role limitation.

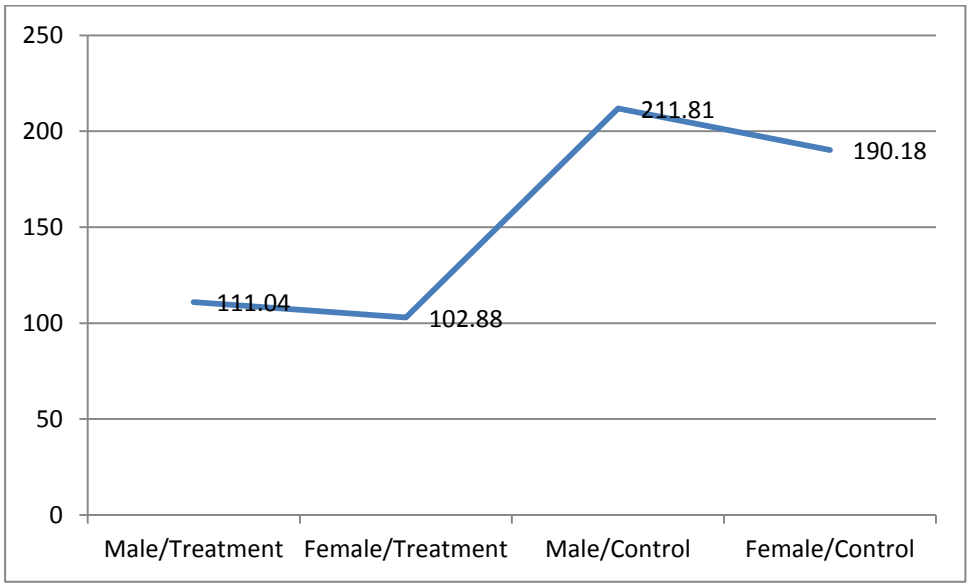


Figure-3: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on emotional role limitation.

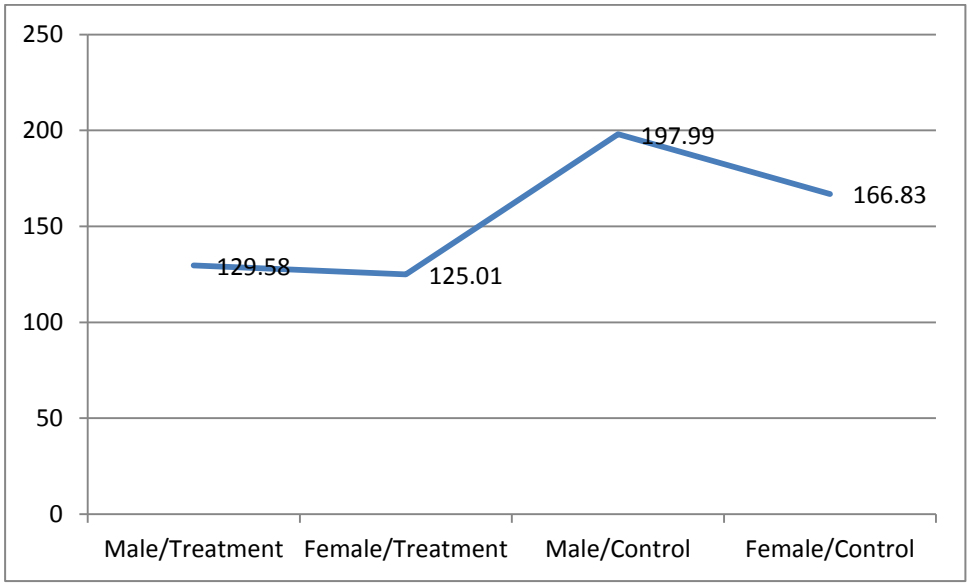


Figure-4: The line graph for the significant effect of the 2 ‘treatment’ x 2 ‘sex’ on energy/fatigue.

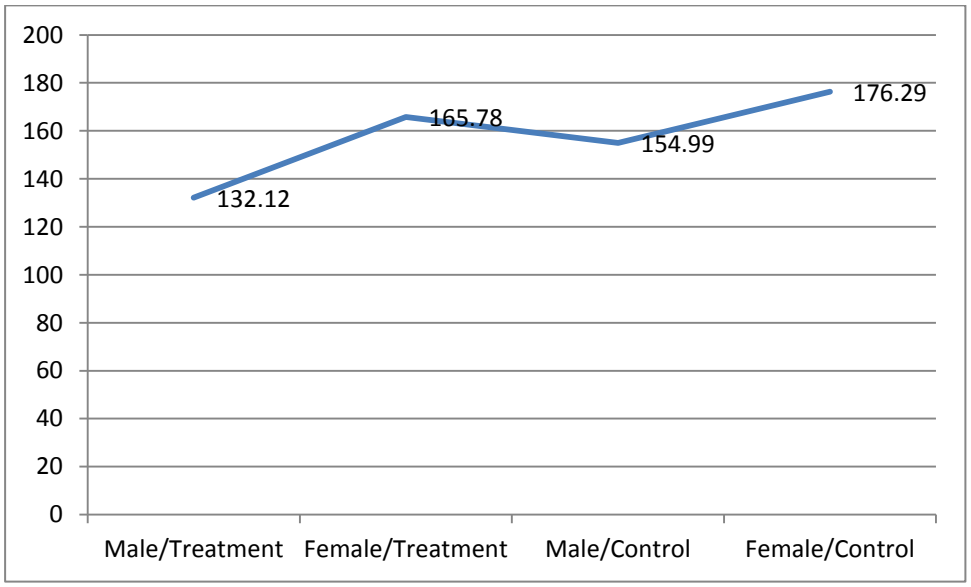


Figure-5: The line graph for the significant effect of the 2 ‘treatment’ x 2 ‘sex’ on pain.

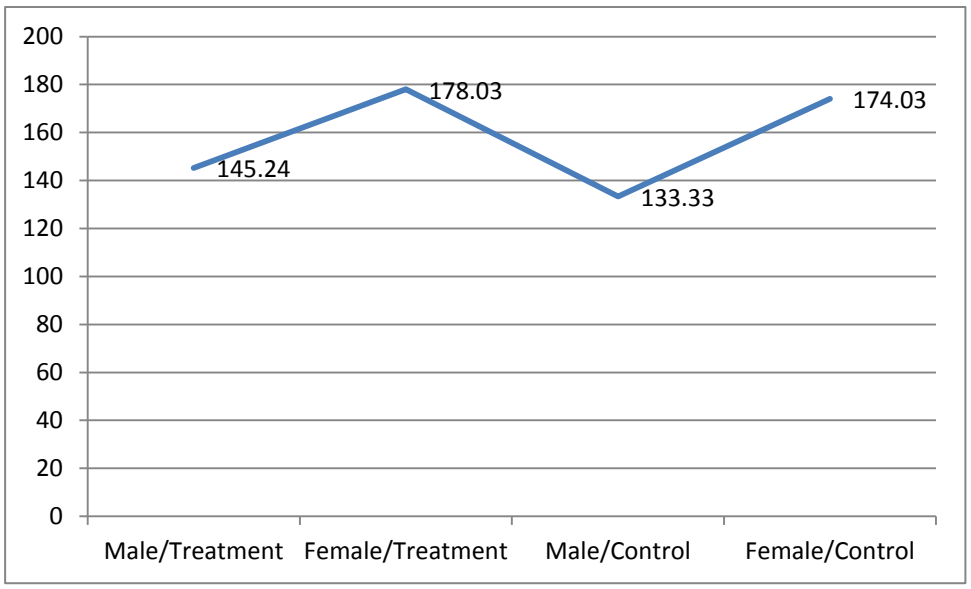


Figure-6: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on general health.

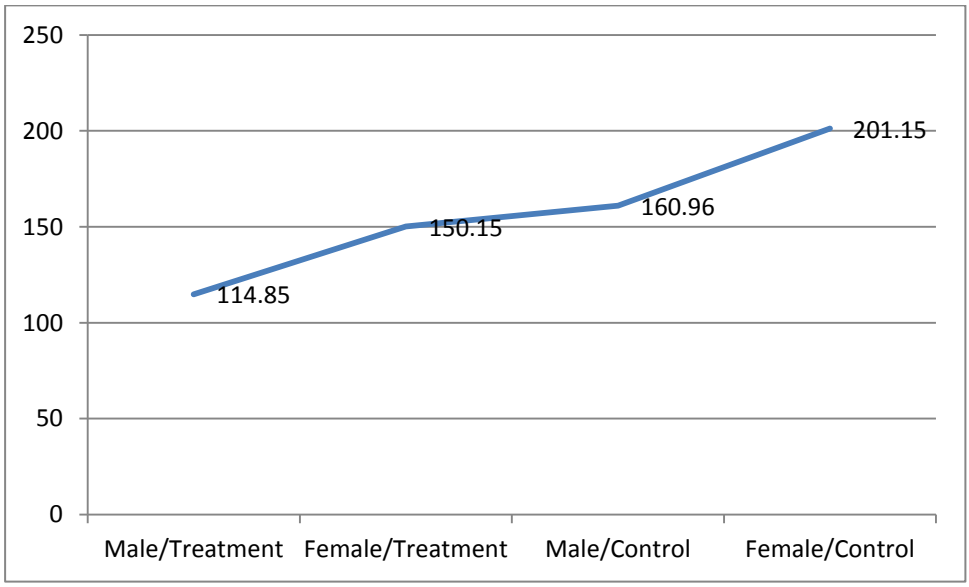


Table-10: The result of the post-hoc multiple comparison (Steele-Dwass test) for the significant effect of the 2 (Treatment) x 2 (sex) on the negative emotional states.

Behavioral Measures	Mean Ranks	Male/ Treatment	Female/ Treatment	Male/ Control	Female/ Control
Depression	132.12	X	-2.26	-1.71	-3.23**
	165.78		X	0.74	-0.71
	154.99			X	-1.52
	176.29				X
Anxiety	145.24	X	-2.3	0.99	-2.2
	178.03		X	2.98*	0.28
	133.33			X	-2.96*
	174.03				X
Stress	114.85	X	-2.41	-3.27**	-6.38**
	150.15		X	-0.7	-3.39**
	160.96			X	-2.74*
	201.15				X

*** Significant at .01 level; * Significant at .05 level.*

The results (Table-10) highlighted the post-hoc multiple comparison (Steele-Dwass test) for the significant effect of the 2 'treatment' x 2 'sex' on the negative emotional states. The results (Table-10) also revealed that male in the treatment show significantly greater mean ranks as compared to the females in the control group as was supported by the line graph (Figure-7) on depression. Subsequently in terms of anxiety, female in both the

treatment and control group show significantly greater mean ranks as compared to the males in the control group (Table-10 & Figure-8). It was also observed that females in the control group show significantly greater mean ranks than all the other groups and that males in the control group show significantly greater mean ranks than females in the treatment group on stress as indicated by the results (Table-10 & Figure-9).

Figure-7: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on depression.

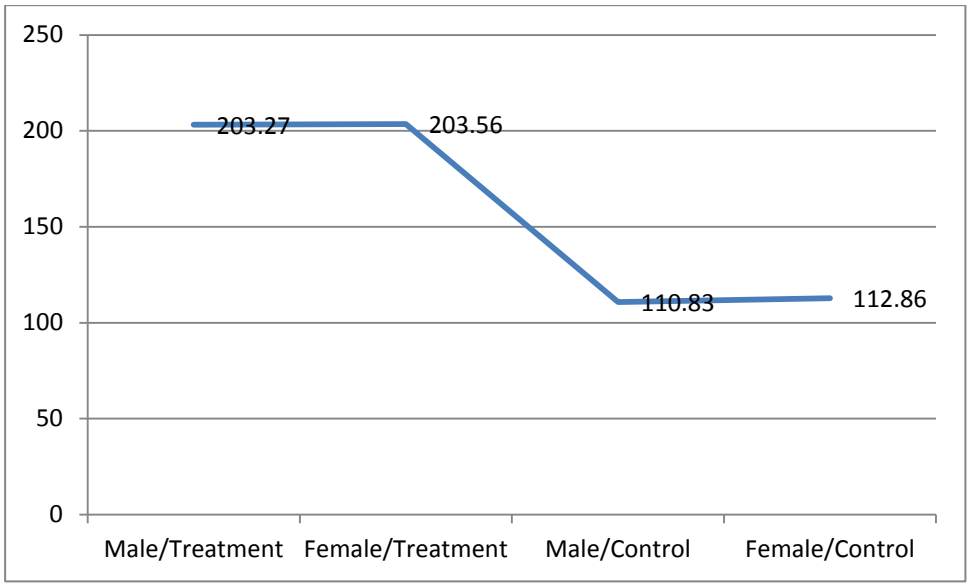


Figure-8: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on anxiety.

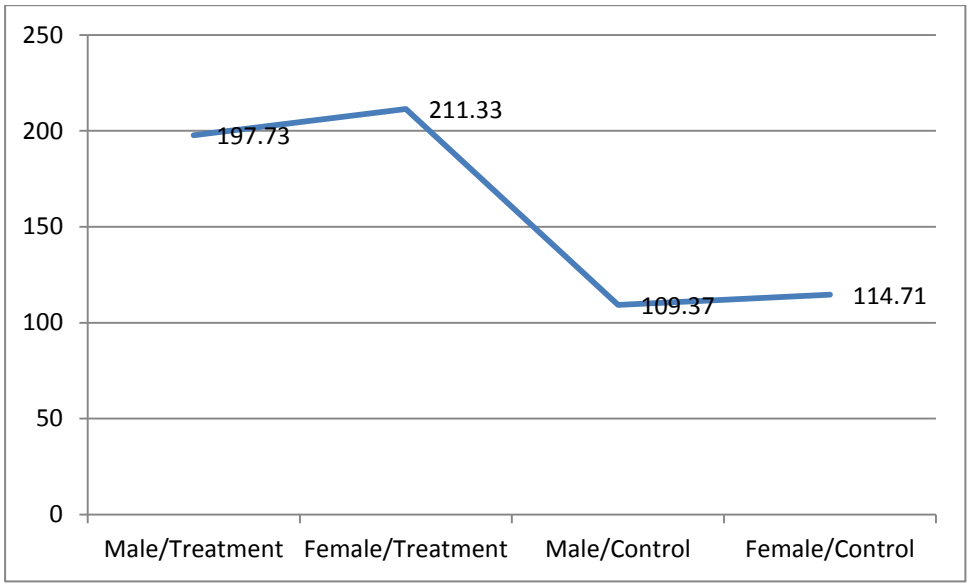


Figure-9: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on stress.

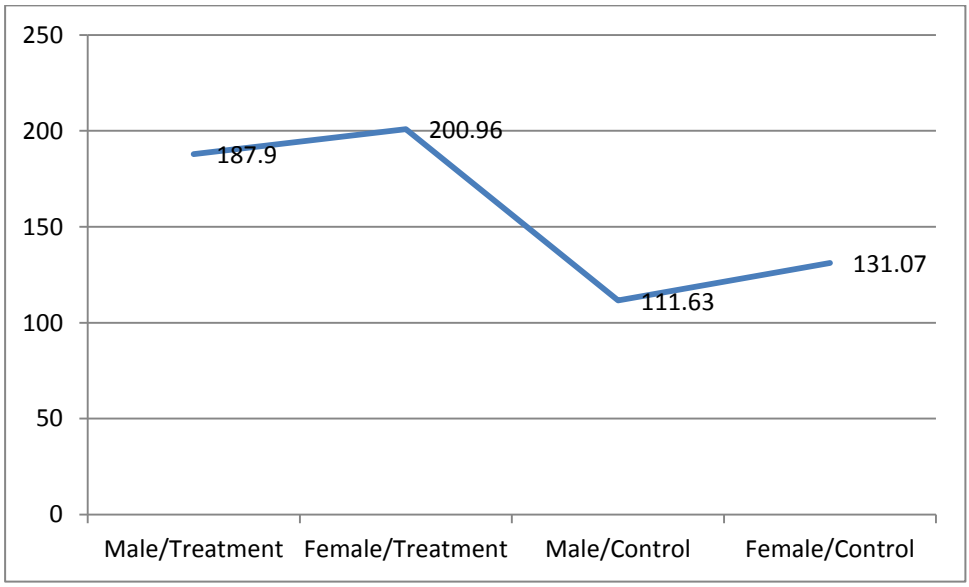


Table-11: The result of the post-hoc multiple comparisions (Steele-Dwass test) for the significant effect of the 2 'treatment' x 2 'sex' on spiritual well-being.

Behavioral Measures	Mean Ranks	Male/ Treatment	Female/ Treatment	Male/ Control	Female/ Control
Personal SWB	203.27	X	0.39	6.46**	6.51**
	203.56		X	6.12**	6.32**
	110.83			X	-0.37
	112.86				X
Communal SWB	197.73	X	-1.15	6.42**	6.26**
	211.33		X	6.37**	6.36**
	109.37			X	-0.62
	114.71				X
Environmental SWB	187.90	X	-0.78	5.39**	4.23**
	200.96		X	5.77**	4.77**
	111.63			X	-1.62
	131.07				X
Transcendental SWB	182.48	X	-2.19	5.63**	3.59**
	213.42		X	6.80**	5.33**
	104.74			X	-2.39
	134.68				X

*** Significant at .01 level; * Significant at .05 level.*

Figure-10: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on personal spiritual well-being.

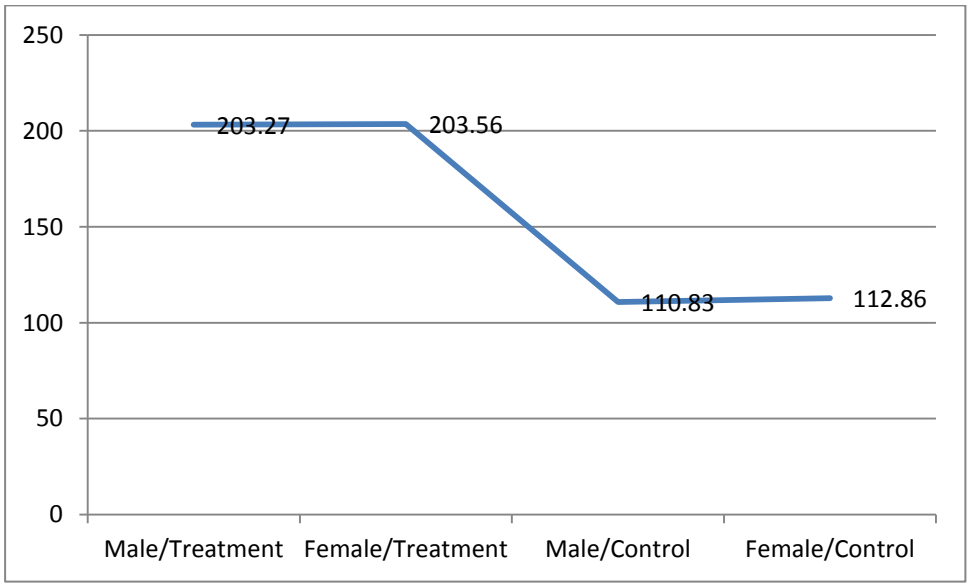


Figure-11: The line for the significant effect of the 2 'treatment' x 2 'sex' on communal spiritual well-being.

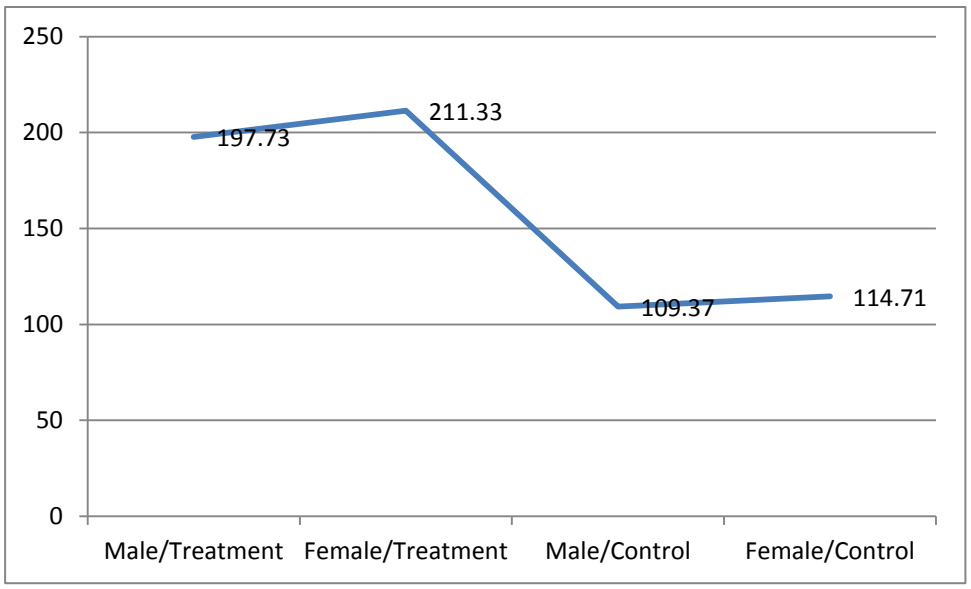


Figure-12: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on environmental spiritual well-being.

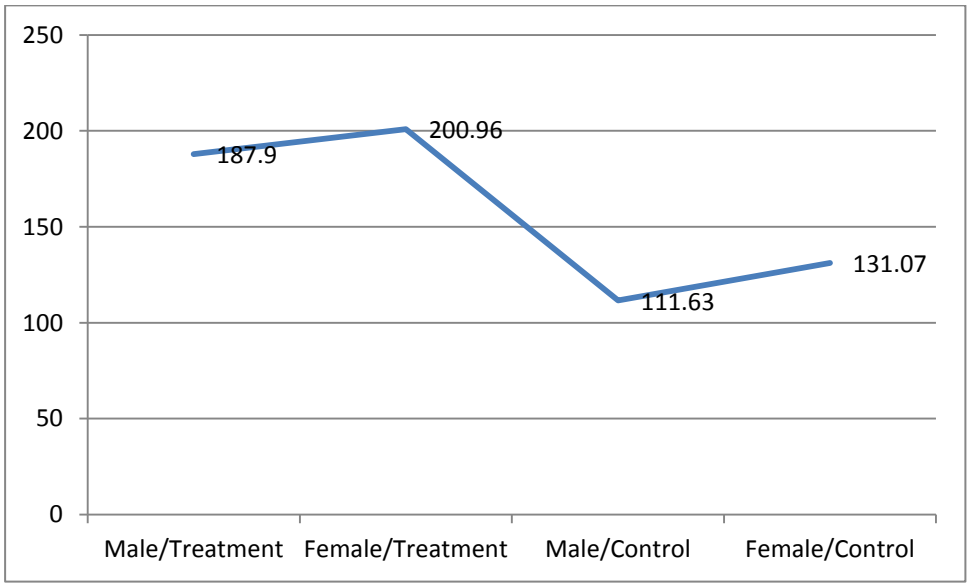
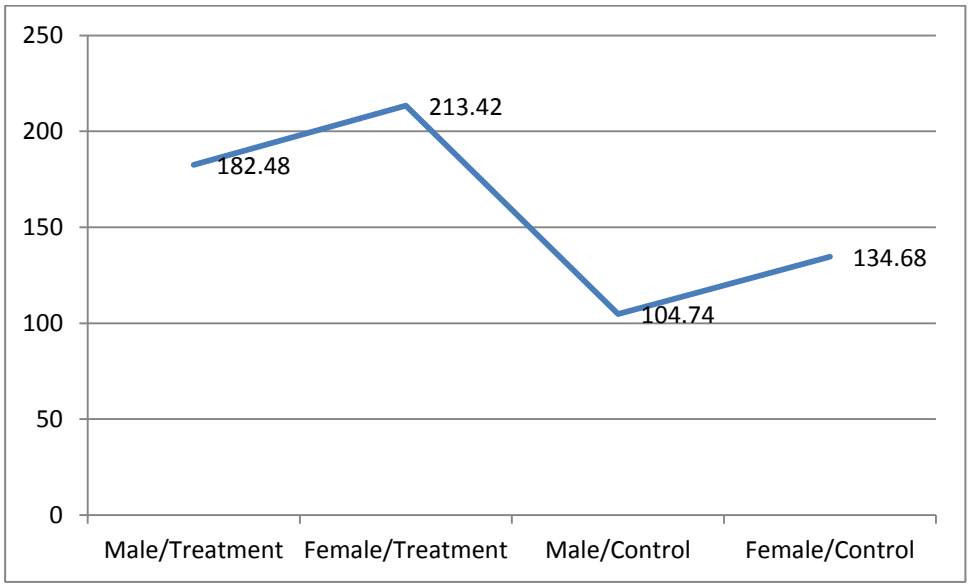


Figure-13: The line graph for the significant effect of the 2 'treatment' x 2 'sex' on transcendental spiritual well-being.



A very uniform pattern of outcomes emerge in the results (Table-11). The results (Table-11 & Figures 10-13) revealed the males & females in the treatment group to show significantly greater mean ranks on personal, communal, environmental & transcendental spiritual well-being as compared to the males & females in the control group.

In view of the target objectives of the study, the data set violating the assumptions of normality and homogeneity of variance, series of binary logistic regression in the prediction of HRQOL from demographic variables, negative emotional states and spiritual well-being was employed.

Table-12: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of physical functioning from the demographic variables, negative emotional states and spiritual well-being.

Predictors	Block-1		Block-2		Block-3	
	B	**Exp. *β***	***B***	**Exp. *β***	***β***	**Exp. *β***
Treatment	3.16**	.04	3.34**	.04	3.63**	.03
Sex	.28	1.32	.09	1.10	-.05	.95
Age	-.02	.98	-.02	.98	-.02	.98
Occupational Status	-.32	.72	-.30	.74	-.24	.78
Educational Qualification	.46**	.63	.47**	.62	.51**	.60
Marital Status	.27	1.31	.34	1.41	.23	1.26
Number of Family Members	.01	1.01	.00	1.00	.01	1.01
Number of Children	-.05	.95	-.03	.97	.00	1.00
Number of Siblings	.05	1.05	.06	1.06	.04	1.05
Birth Order	.04	1.04	.05	1.05	.04	1.04
Breadwinner	-.38	.68	-.37	.69	-.36	.70
Number of Bread Earners	.26	1.29	.27	1.31	.29	1.33
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.11	.90	-.10	.90
Anxiety			-.10	.91	-.08	.92
Stress			-.01	.99	.00	1.00
Personal SWB					.17	1.18
Communal SWB					.08	1.09
Environmental SWB					-.18	.84
Transcendental SWB					-.07	.93

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of physical functioning from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-12. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.59), acceptable model fit (χ^2=5.18; df=8; p=.74) and 83.60% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.61), acceptable model fit (χ^2=8.87; df=8; p=.35) and 83.30% of the cases correctly classified in the second block; and successful predictability of the criterion

(Nagelkerke R^2=.62), acceptable model fit (χ^2=10.66; df=8; p=.22) and 83.90% of the cases correctly classified in the final block. The results (table-12) revealed being in the control group and higher educational qualification indicate better physical functioning.

Table-13: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of physical role limitation from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***B***	**Exp. *β***	***β***	**Exp. *β***
Treatment	2.09**	.12	2.14**	.12	2.37**	.09
Sex	.23	1.26	.19	1.21	.18	1.19
Age	-.05**	.95	-.06**	.94	-.06**	.94
Occupational Status	.08	1.08	.10	1.10	.13	1.14
Educational Qualification	.22	.80	.21	.81	.22	.80
Marital Status	.10	1.11	.14	1.15	.13	1.14
Number of Family Members	.01	1.01	.00	1.00	-.01	.99
Number of Children	.07	1.08	.09	1.09	.09	1.10
Number of Siblings	.02	1.02	.03	1.03	.02	1.02
Birth Order	-.01	.99	-.02	.98	-.03	.97
Breadwinner	-.35	.70	-.34	.71	-.26	.77
Number of Bread Earners	.11	1.11	.11	1.12	.10	1.11
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.19*	.83	-.18*	.83
Anxiety			-.10	.91	-.09	.91
Stress			.14	1.15	.15	1.16
Personal SWB					.11	1.11
Communal SWB					.02	1.02
Environmental SWB					.00	1.00
Transcendental SWB					-.05	.95

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of physical role limitation from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-13. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.44), acceptable model fit (χ^2=5.46; df=8; p=.71) and 77.20% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.47), acceptable model fit (χ^2=10.71; df=8; p=.22) and 77.50% of the cases correctly classified in the second block; and successful predictability of the criterion (Nagelkerke R^2=.47), acceptable model fit (χ^2=3.78; df=8; p=.88) and 77.50% of the cases

correctly classified in the final block. The results (table-13) revealed being in the control group to indicate better physical role, whereas, higher age group of depression indicated higher physical role limitation.

Table-14: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of the prediction of emotionalrole limitation from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***β***	**Exp. *B***	***β***	**Exp. *β***
Treatment	2.12**	.12	2.56**	.08	2.33**	.10
Sex	.49	1.63	.33	1.38	.30	1.35
Age	-.06*	.94	-.08**	.93	-.08**	.93
Occupational Status	.12	1.13	.22	1.25	.22	1.24
Educational Qualification	.23	.80	.21	.81	.21	.81
Marital Status	.63*	1.88	.80*	2.23	.82*	2.27
Number of Family Members	.03	1.03	.02	1.02	.03	1.03
Number of Children	-.16	.85	-.11	.89	-.11	.90
Number of Siblings	.18*	1.19	.18*	1.20	.19*	1.20
Birth Order	-.12	.88	-.11	.89	-.10	.91
Breadwinner	-.06	.94	.03	1.03	-.04	.96
Number of Bread Earners	.17	1.19	.17	1.18	.16	1.18
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.15	.86	-.16	.85
Anxiety			-.10	.91	-.09	.91
Stress			-.11	.89	-.14	.87
Personal SWB					-.05	.95
Communal SWB					-.06	.94
Environmental SWB					-.08	.93
Transcendental SWB					.05	1.05

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of emotionalrole limitation from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-14. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.45), acceptable model fit (χ^2=7.44; df=8; p=.49) and 76.20% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.51), acceptable model fit (χ^2=6.09; df=8; p=.64) and 79.70% of the cases correctly classified in the second block; and successful predictability of the criterion (Nagelkerke R^2=.51), acceptable model fit (χ^2=3.37; df=8; p=.91) and 80.70% of the

cases correctly classified in the final block. The results (table-14) revealed being in the control group and stable marital status and more number of siblings to indicate better emotional role, whereas, increase in age indicated emotional role limitation.

Table-15: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of prediction of energy/fatigue from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***β***	**Exp. *β***	***B***	**Exp. *B***
Treatment	.58	.56	1.01**	.36	1.31**	.27
Sex	.85**	2.34	.69*	2.00	.82**	2.28
Age	.00	1.00	-.01	.99	-.01	.99
Occupational Status	.08	1.08	.19	1.21	.19	1.20
Educational Qualification	.00	1.00	-.07	1.07	-.05	1.05
Marital Status	-.09	.91	-.03	.97	.02	1.02
Number of Family Members	.04	1.04	.05	1.05	.03	1.03
Number of Children	.00	1.00	.03	1.03	.02	1.02
Number of Siblings	.03	1.03	.04	1.04	.03	1.03
Birth Order	.05	1.05	.08	1.08	.08	1.08
Breadwinner	.02	1.02	.14	1.15	.27	1.31
Number of Bread Earners	.00	1.00	.02	1.02	.00	1.00
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.22**	.81	-.20*	.82
Anxiety			-.20	.82	-.19	.83
Stress			-.12	.88	-.11	.89
Personal SWB					.08	1.09
Communal SWB					-.04	.96
Environmental SWB					.17*	1.18
Transcendental SWB					-.05	.95

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of energy/fatigue from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-15. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.08), acceptable model fit (χ^2=9.34; df=8; p=.32) and 62.10% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.27), acceptable model fit (χ^2=14.62; df=8; p=.07) and 73.00% of the cases correctly classified in the second block; and successful predictability of the criterion

(Nagelkerke R^2=.30), acceptable model fit (χ^2=4.49; df=8; p=.81) and 70.40% of the cases correctly classified in the final block. The results (table-15) revealed being female and being in the control group indicated better energy and less fatigue. Similarly, better environmental spiritual well-being indicated better energy and lesser fatigue. In contrast, higher level of depression indicated lower energy and more fatigue.

Table-16: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of emotional well-being from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***β***	**Exp. *β***	***β***	**Exp. *β***
Treatment	.34	1.41	.27	.76	.63	.53
Sex	.43	1.54	.10	1.10	.16	1.17
Age	.01	1.01	-.01	.99	-.01	.99
Occupational Status	.10	1.11	.33	1.39	.34	1.41
Educational Qualification	-.03	1.03	-.14	1.15	-.12	1.13
Marital Status	.03	1.03	.04	1.04	.07	1.07
Number of Family Members	.02	1.02	.03	1.03	.02	1.02
Number of Children	-.03	.97	-.01	.99	.00	1.00
Number of Siblings	.00	1.00	.00	1.00	-.02	.98
Birth Order	.06	1.06	.11	1.11	.10	1.11
Breadwinner	-.26	.77	-.19	.83	-.08	.92
Number of Bread Earners	-.01	.99	-.03	.97	-.04	.96
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.39**	.68	-.37**	.69
Anxiety			.03	1.03	.05	1.05
Stress			-.28**	.75	-.27**	.76
Personal SWB					.12	1.12
Communal SWB					.03	1.03
Environmental SWB					.11	1.11
Transcendental SWB					-.08	.93

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of emotional well-being from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-16. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.06), acceptable model fit (χ^2=6.23; df=8; p=.62) and 61.10% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.37), acceptable model fit (χ^2=7.62; df=8; p=.47) and 72.30% of the cases

correctly classified in the second block; and successful predictability of the criterion (Nagelkerke R^2=.40), acceptable model fit (χ^2=3.66; df=8; p=.89) and 73.30% of the cases correctly classified in the final block. The results (table-16) revealed higher level of depression and stress indicated lower emotional well-being.

Table-17: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of social functioning from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***B***	**Exp. *β***	***β***	**Exp. *B***
Treatment	.23	.80	.74*	.48	.85*	.43
Sex	.39	1.48	.11	1.12	.01	1.01
Age	.01	1.01	-.01	.99	-.01	.99
Occupational Status	.27	1.32	.45*	1.58	.55**	1.73
Educational Qualification	-.08	1.09	-.16	1.18	-.15	1.16
Marital Status	-.16	.85	-.11	.90	-.13	.88
Number of Family Members	.04	1.04	.06	1.06	.03	1.03
Number of Children	-.06	.94	-.04	.96	-.04	.96
Number of Siblings	.09	1.10	.11	1.11	.09	1.10
Birth Order	.00	1.00	.02	1.02	.03	1.03
Breadwinner	-.31	.73	-.25	.78	-.06	.94
Number of Bread Earners	.08	1.08	.10	1.11	.05	1.06
Monthly Family Income	.00*	1.00	.00**	1.00	.00**	1.00
Depression			-.16*	.86	-.16	.86
Anxiety			-.14	.87	-.11	.90
Stress			-.25**	.78	-.25**	.78
Personal SWB					.25**	1.29
Communal SWB					-.11	.90
Environmental SWB					.06	1.06
Transcendental SWB					-.14*	.87

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of social functioning from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-17. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.10), acceptable model fit (χ^2=8.26; df=8; p=.41) and 61.40% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.30), acceptable model fit (χ^2=9.31; df=8; p=.32) and 68.50% of the cases correctly classified in the second block; and successful predictability of the criterion

(Nagelkerke R^2=.34), acceptable model fit (χ^2=8.03; df=8; p=.43) and 71.70% of the cases correctly classified in the final block. The results (table-17) revealed being in the control group, higher occupational status, higher monthly income and personal spiritual well-being indicated better social functioning. In contrast, higher level of stress and transcendental spiritual well-being indicated lower level of social functioning.

Table-18: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of pain from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***β***	**Exp. *β***	***B***	**Exp. *B***
Treatment	1.43**	.24	1.77**	.17	1.50**	.22
Sex	-.14	.87	-.35	.70	-.39	.68
Age	.01	1.01	.00	1.00	.00	1.00
Occupational Status	.04	1.04	.09	1.10	.09	1.09
Educational Qualification	.15	.86	.14	.87	.12	.88
Marital Status	-.29	.75	-.23	.80	-.21	.81
Number of Family Members	.01	1.01	.01	1.01	.00	1.00
Number of Children	-.03	.97	-.01	.99	-.01	.99
Number of Siblings	.07	1.08	.08	1.08	.09	1.09
Birth Order	-.04	.96	-.02	.98	-.02	.98
Breadwinner	-.48*	.62	-.46	.63	-.50*	.61
Number of Bread Earners	.23	1.26	.25	1.28	.25	1.28
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.12	.89	-.15	.86
Anxiety			-.08	.93	-.10	.91
Stress			-.11	.89	-.11	.90
Personal SWB					-.13	.88
Communal SWB					.02	1.02
Environmental SWB					.09	1.09
Transcendental SWB					-.03	.97

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of pain from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-18. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.27), acceptable model fit (χ^2=16.96; df=8; p=.03) and 71.70% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.34), acceptable model fit (χ^2=4.99; df=8; p=.76) and 72.70% of the cases correctly

classified in the second block; and successful predictability of the criterion (Nagelkerke R^2=.36), acceptable model fit (χ^2=6.79; df=8; p=.56) and 73.60% of the cases correctly classified in the final block. The results (table-18) revealed being in the control group indicated lower level of pain, whereas, being in the breadwinner indicated experiences of pain.

Table-19: The Beta-coefficients and Exponential Beta values for the binomial logistic regression in the prediction of general health from the demographic variables, negative emotional states and spiritual well-being.

Predictors	**Block-1**		**Block-**		**Block-3**	
	B	**Exp. *β***	***β***	**Exp. *β***	***β***	**Exp. *B***
Treatment	2.72**	.07	3.03**	.05	3.05**	.05
Sex	.59	1.81	.52	1.69	.45	1.56
Age	.00	1.00	-.01	.99	-.01	.99
Occupational Status	.14	1.15	.19	1.20	.22	1.24
Educational Qualification	.23	.80	.20	.82	.21	.81
Marital Status	-.22	.80	-.16	.85	-.17	.84
Number of Family Members	.12	1.13	.11	1.11	.10	1.11
Number of Children	-.06	.94	-.04	.96	-.03	.97
Number of Siblings	.02	1.02	.03	1.03	.03	1.03
Birth Order	-.01	.99	-.02	.98	-.03	.97
Breadwinner	-.36	.69	-.36	.70	-.31	.73
Number of Bread Earners	.08	1.09	.09	1.10	.07	1.07
Monthly Family Income	.00	1.00	.00	1.00	.00	1.00
Depression			-.31**	.74	-.32**	.73
Anxiety			.10	1.11	.11	1.11
Stress			.08	1.08	.09	1.10
Personal SWB					.06	1.06
Communal SWB					.01	1.01
Environmental SWB					.02	1.02
Transcendental SWB					-.07	.93

*** Significant at .01 level; * Significant at .05 level.*

The outcomes of the binary logistic regression analyses in the prediction of general health from the demographic variables, the negative emotional states and spiritual well-being are presented in Table-19. The model summary revealed: successful predictability of the criterion (Nagelkerke R^2=.51), acceptable model fit (χ^2=5.56; df=8; p=.70) and 80.40% of the cases correctly classified in the first block; successful predictability of the criterion (Nagelkerke R^2=.55), acceptable model fit (χ^2=6.28; df=8; p=.62) and 81.00% of the cases

correctly classified in the second block; and successful predictability of the criterion (Nagelkerke R^2=.55), acceptable model fit (χ^2=10.29; df=8; p=.25) and 80.70% of the cases correctly classified in the final block. The results (table-19) revealed being in the control group indicated better general health, whereas, higher lower level of depression indicated better general health.

The results revealed better HRQOL for the control group as compared to the treatment group consistently throughout the analyses (Tables- 12 to 19). Increase in age and depression indicated significant decrease in physical role limitation, higher occupational status indicated better social functioning and personal spiritual well-being and lower level of stress and transcendental transcendental spiritual well-being. Higher educational qualification indicated lower physical functioning. Being the breadwinner indicated experiences of pain. Higher level of depression indicated lower level of emotional well-being and general health. Higher level of stress indicated lower level of emotional well-being and social functioning. Higher level of personal spiritual well-being indicated better social functioning and higher level of emotional spiritual well-being indicated better energy and lower fatigue. Higher level of transcendental spiritual well-being indicated lower social functioning. Larger number of siblings and better marital status indicated better emotional role and better income indicated better social functioning.

The descriptive statistics and the inferential statistics revealed that being in the treatment group indicate better socio-economic status, health related quality of life and higher level of depression and stress. The present finding also revealed that low level of socio-economic status (SES) is generally accepted as having broad and significant effects on health status and risk for disease, disability and death.

A vast body of international research supports associations between low SES and morbidity and mortality from a range of conditions, including cardiovascular disease (Brezinka & Kittel, 1996; Hallqvist et al., 1998; Osier et al., 2000; Tyroler, 1999), overweight and obesity (Sarlio-Lahteenkorva & Lahelma, 1999; Sobal & Stunkard, 1989), certain cancers (Logan, 1982), injury (Cubbin et al., 2000) and suicide (Cantor et al., 1995). Low SES has also been linked with risk of engaging in unhealthy behaviours including smoking (Graham and Hunt, 1994), poor diet (Baghurst et al., 1990), physical inactivity (Crespo et al., 1999), and failure to undertake preventive health practices (Rohlfs et al., 1999). The similarity of the SES-mortality gradient for a range of different conditions suggests that low SES may lead to an increase in general susceptibility to disease (Marmot et al., 1984).

Individuals with high SES perceive more stress than their middle and low SES counterparts. In fact, there is evidence that people of high SES may be more prone to experience stress and distress (e.g., depression) than their counterparts because of strains associated with interpersonal conflict at work (Inoue & Kawakami, 2010) and low occupational control (Kunz-Ebrecht et al., 2004).

The outcomes of the present study revealed that being in the treatment group indicated larger family structure and better overall in spiritual well-being emerged to be consistent with results from other investigators. It is widely accepted that spiritual care of

palliative patients, near the end-of-life, is an important part of their total care and that its provision is a multi-disciplinary task (Milligan, 2004; Spiritual Care Work Group of International Work Group on Death Dying and Bereavement, 1990; Thomson, 2000; Wesley, 2004).

One way of working with family groups in providing psycho-social and spiritual care has been described by Murphy (1999). This type of family meeting is in many ways a sacred event, a time for making peace, discharging old resentments, giving thanks and saying goodbye. Murphy (1999) developed a five-part paradigm to guide families through this process which includes: the story of the wound (told by the dying member), worries and fears, roots (bringing out memories from the shadows), hearing from other family members, and a blessing or closing of the meeting (Murphy, 1999). One of the fundamental premises of this model is the demonstrated value of telling and re-framing of stories (Chochinov, 2005; Richard, 2003). Three main roles are described within the model which are: the story teller (the patient and then other members of the family), the witnesses (those who listen to the story), and the guide or facilitator who has the task of encouraging and supporting the story teller and other family members.

The results from the present study indicate the dominance of female on negative emotional states.Women suffer certain Stressors more often than men and may be more vulnerable to develop depression in response to stress because of a number of factors. Both stress experiences and stress reactivity contribute directly to women's greater rates of depression compared with men. Stress experiences and stress reactivity also feed on each other. However, the more stress women suffer, the more hyper responsive they may be to stress, both biologically and psychologically. This hyper responsiveness may undermine women's ability to control their environments and overcome their stress, leading to even more stress in the future. In addition, depression contributes directly to more stressful experiences,

by interfering with occupational and social functioning, and to vulnerability to stress, by inciting rumination, robbing the individual of any sense of mastery she did have, and possibly sensitizing the biological systems involve in the stress response (Nolen-Hoeksema, 2001).

In the reviews of the literature on gender differences in depression, researchers (Piccinelli & Wilkinson, 2000; Bebbington, 1996) offer indirect evidence for the contribution of social factors to the disproportionately higher rates of depression in women can be found by examining gender differences in depression in populations in which various social factors are controlled for and equally distributed by gender. If women have an intrinsic vulnerability to depression, higher prevalence rates of depression would be expected in women in populations and circumstances in which potentially depressogenic stressors are proportionate by gender. An absence of gender disparity in such contexts would argue against an intrinsic vulnerability to depression in women.

Even when women and men are confronted with similar stressors, women may be more vulnerable than men to developing depression and related anxiety disorders such as posttraumatic stress disorder. Women's greater reactivity compared with men's has been attributed to gender differences in biological responses, self-concepts, and coping styles (Breslau et al., 1997). One of the most robust findings in psychiatric epidemiology is that the prevalence of depression is greater among women than men (Nolen-Hoeksema, 1987). While both social and biological factors have been suggested as etiological factors, neither perspective has been able to adequately account for the difference. One compelling line of inquiry to understand this gender gap in depression remains to be concerned with examining changes in the sex ratio across the life course (Bebbington et al., 1998).

Higher age group indicates larger family structure and higher SWB whereas lower age group indicates better HRQOL in the present study. Good physical functioning and emotional

and psychosocial well-being help in maintaining overall well-being in old age, indeed, good functioning in one of these domains is often associated with good functioning in the others (Charles & Carstensen., 2009; Depp, Vahia & Jeste., 2010; Fratiglioni et al., 2004; Friedman et al., 2010; Gow et al., 2007; Okabayashi et al., 2004). Active engagement and coping with age related challenges such as functional limitations, physical disability or dependence on others, which are associated with feelings of depression, may reflect good social resources and successful psychosocial adaptation, including strategizing and positive attitudes (Kruger, 2009; Rowe & Kahn., 1987).

The diagnosis of malignant disease causes serious psychological distress to the affected person, and the illness can have severe consequences for the family (Couper et al., 2006; Cotrim & Pereira., 2008; Steinberg et al., 2009; Clark et al., 2010). Family members often spend a lot of time providing the diseased person with practical and emotional support during, between and after treatments. Supportive care from family members, in addition to emotional support, includes different kinds of assistance, such as help with household tasks, transportation, medical appointments and medication management (Finfgeld-Connett., 2005; Nausheen, 2009).

The higher proportion of successful aging in elders was found among those who were relatively younger, had social support, not frail, and had no pain, sleep impairment, and fall history. These findings revealed the importance of considering suitable intervention to improve the frailty, pain, and sleep problems among the elders. However, the causal relationships between these factors and successful aging will require further investigations (Chia-Ing Li et al., 2014).

Occupational status as a predictor of HRQOL showed that better occupations indicate better HRQOL. The finding emerged to be consistent with other studies that examined the

same regards. A literature survey showed that people experiencing occupational problems are found to have poor HRQOL (Zyoud et. al., 2015; Liu et. al., 2015). Zahranet and colleagues (2003) reported that low income adults aged between 45 to 64 years have worse HRQOL than all other adults. Furthermore, the results obtained by researchers indicate that high occupational competence supports a higher HRQOL (Ishibashi et. al., 2013).

The finding that larger number of siblings and stable marital status indicated better emotional status finds corroborative evidence from study revealing that adult siblings are important sources of love, support, aid, and companionship to one another (Cicirelli, 1995). Typical sibling relationships provide siblings with experiences that "foster the development of emotional understanding, self regulation, and a sense of belonging and comfort" (Orsmond & Seltzer, 2007). In addition, Nonmarital and marital emotionally intimate relationships are important to the adjustment and well-being of most individuals (Feldman et al., 1998; Waite & Gallagher 2000). Relationships with high levels of emotional intimacy have been found to promote psychological well-being and are an important factor in relationship adjustment (Prager 1995; Reis & Shaver, 1988).

Consistent with findings from other researchers higher educational qualifications indicate lower spiritual well-being and better HRQOL. Researchers suggested that education is especially relevant for emotional well-being, because it represents development of personal characteristics such as critical thinking and problem-solving which instil a sense of control over one’s life and thereby protect against anxiety and depression (Ross & Myrowsky, 2006). However, in contrast to these findings, some researcher showed greater spiritual, personal, community and environmental well-being, and greater satisfaction with learning (Muñoz-García & Aviles-Herrera, 2014).

There are few studies that examined anxiety and depression in gastrointestinal cancer patients (Nordin et al., 1996). In their studies of gastrointestinal cancer patients have shown

that overall 17% of gastrointestinal patients suffer from anxiety and 21% experience depression and that those with gastric cancer are more vulnerable to psychological distress in connection with the diagnosis than are colorectal cancer patients. They also showed that there are only minor changes over time in the average values of emotional well-being in these patients (Nordin & Glimelius, 1998). In addition they have indicated that levels of anxiety and depression at diagnosis could predict a similar status 6 months later (Nordin & Glimelius., 1999). Importantly they found that patients' satisfaction with life, as defined in terms of the discrepancy between the perceived attainment and subjective importance of various life values, is associated with anxiety and depression (Nordin et al., 2001).

The level of risk for emotional distress depends on a variety of factors. Younger and less-educated patients or those with more severe cancer tend to experience more psychological distress, particularly near the time of diagnosis (Andersen et al., 1994; Compas et al., 1999; Vinocur et al., 1990). Among the various personality characteristics that have been studied, dispositional optimism, or the tendency to expect positive outcomes, has been most consistently associated with lower symptoms of anxiety and depression and higher quality of life (Carver et al., 1993; Epping-Jordan et al., 1999).

The study also revealed that higher spiritual well-being indicated better HRQOL. It has been demonstrated that religious well-being and spiritual well-being were conceptually and statistically distinct and had different impacts on health related quality of life (Edmondson, 2008). A negative correlation between spiritual well-being and anxiety and depression has been identified but no such correlation was observed in relation to religiosity (Mc Coubrie et al., 2006).

Religious participation may affect mental health by encouraging social integration and increasing interaction among people with similar values systems (Idler, 1987), thus

fostering strong and weak social ties. Such ties may provide emotional, instrumental, and anticipated support (Ellison and George 1994). Several studies have found positive associations between social support and improved mental health (House, Landis, Umberson, 1988; Krause 1997 & Paykel, 1994).

The results also revealed that higher level of stress indicated lower level of emotional well-being and general health. Dull and Skokan (1995) proposed that as a cognitive schema religious and spiritual factors would have an impact on an individual's "illusions" about an event. That is, such beliefs might engender an attitude of optimism, an experience of control, and a sense of event meaning that would in turn affect the level of stress experienced and ultimately one's physical health. In this model, they further acknowledge that a belief in a higher power specifically could moderate the perception of a stressful life event. Daaleman and colleagues (2001) proposed a similar model in that core beliefs such as spirituality can affect agency and well-being through the mediating pathways of life schema and positive intentionality. In a cross-sectional study with a sample of undergraduate students (Ai et al., (2005) found that spiritual support, prayer, and strength of faith were positively correlated with optimism and that positive attitude (hope and optimism) operated as a mediator in the link between spirituality and distress.

The study revealed that negative emotional states negatively related with Spiritual well-being. Studies of religion and mental health have generally focused on a limited number of mental health indicators, most often depressive symptoms or psychological distress, to the exclusion of anxiety symptoms. This absence is problematic because depression and anxiety are conceptually distinct domains, with differing etiologies and prescribed treatments (Dobson, 1985; Jonas, Franks & Ingram 1997; Kessler et al. 2007; Payton, 2009), and as such may be influenced by religion differently. For instance, depression stems from a feeling of hopelessness and an absence of connectivity to others, whereas anxiety is rooted in a feeling

of vulnerability and fear. Thus, religious domains that address connectivity and hope (participation in organized religious activities, religious forgiveness, congregational support or criticism, sense of shared mission or purpose) may likely have a more pronounced effect on depression than anxiety.

A great deal of research has documented that distress, reflected in symptoms of anxiety and depression as well as negative affect more generally, is related to poorer health behaviors (Strine et al., 2004; Rozanski et al., 2005). Distress related to one's cancer experience has been hypothesized to be related to behavior changes in both more and less healthful directions. The hypothesis that distress may facilitate adaptive health behavior change is based on the notion that distress, especially fear, may give rise to motivation to change and that making adaptive health behavior change may be a way of coping with and decreasing one's distress. On the other hand, some have hypothesized that distress may lead to a variety of dysfunctional health behaviors (Mc Caul, 2005).

Several reviews and meta-analyses have provided evidence for the association between spirituality and well-being (Ano & Vasconcelles, 2005; George et al., 2000; Hackney & Sanders, 2003; Hill & Pargament, 2003; Koenig & Larson, 2001; Sawatzky et al., 2005; Smith et al., 2003; Visser et al., 2010; Yonker et al., 2012). Studies have also demonstrated that, compared to people who show less spiritual involvement, patients with a serious disease who attach great value to spirituality show better adjustment, experience a higher level of well-being and quality of life, and experience a lower level of distress (Riley et al., 1998). However, it is less well understood how spirituality might achieve this effect.

One of the first areas that were explored for explanations of the religion-mental health association is the social domain. Church attendance and other organized activities with fellow believers might increase the amount of social support that is received and other relationships

might also be of higher quality for religious persons. This was confirmed by Koenig and Larson, who found a relationship between religious involvement and greater social support in virtually all (19 of 20) studies in their review. They explain this finding by suggesting that most religious teachings prescribe support and care for one another. Also, most studies showed that greater religiousness or similarity in religious backgrounds predicted greater marital happiness or stability (Koenig & Larson, 2001).

Higher level of emotional spiritual well-being indicated better energy and lower fatigue in the present study. Researchers have also proposed that religion/spirituality functions in a more indirect way in the adjustment process via various pathways of influence. Extensive reviews (Ellison & Levin, 1998; Hill & Butter, 1995; Levin, 2001; Oman & Thoresen, 2005) posit between 5 and 7 possible mechanisms through which spirituality could have an effect on health including: the promotion of stronger and more available support and the enhancement of positive psychological states. Feher and Maly (1999) found that women talked about the role of faith in relation to their sense of emotional and social support and hope with respect to their breast cancer. In addition, Nairn and Merluzzi (2003) found that cancer patients who invoked a sense of coping in collaboration with a higher power reported more acceptances, a more positive attitude and greater confidence in seeking support. Oman and Thoresen (2005) concluded that the investigation of such mediators in the spirituality health link requires immediate attention while longitudinal studies in particular are needed to confirm or disconfirm the viability of such pathways (Levin, 2001) in response to events such as cancer (Sherman & Simonton, 2001).

In a study of breast cancer patients, Mickleyand colleagues (1992) found a link between intrinsic religiosity and religious well-being and greater hope regardless of disease stage. Fehring and colleagues (1997) also found a relationship between intrinsic religiousness and higher hope and lower distress for hospitalized elderly cancer patients. And yet, other

studies have found no association between optimism and religious coping at any time across the first year of adjustment to breast cancer (Carver et al., 1993) or that the use of religious/spiritual coping at the point of breast cancer diagnosis is helpful only for women with low levels of hope (Stanton et al., 2002).

Higher level of personal spiritual well-being indicated better social functioning. Although there is significant evidence of a link between religion/spirituality and health (Koenig et al. 2001) much remains to be explored in relation to the possible mechanisms that may account for this association. Some have noted that religious/spiritual beliefs can have a direct effect on the levels of distress an individual experiences in response to a stressful life event. In a qualitative study, Gall andCornblat (2002) found that some breast cancer survivors utilized spiritual beliefs (e.g., thoughts of a positive God) to aid in the reduction of emotional distress under high stress circumstances (i.e., chemotherapy). Such beliefs were found to be soothing and comforting when women were experiencing anxiety and fear. Ai and colleagues (1998) found that personal prayer was related to a decrease in distress for cardiac patients at 1 year post surgery. Similarly, Harris and colleagues (1995) revealed that religiosity and the frequency of religious practices early on predicted improved health and general well-being of heart transplant patients at 1 year post-surgery.

Thus far, the strongest empirical foundation has been formed by the conviction that religious-spiritual aspects of functionality are the source of the meaning of life, resulting indirectly in the improvement of psychological well-being (Wnuk et al., 2009; Steger & Frazier 2005; Zika & Chamberlain 1988; Vilchensky & Kravetz 2005; French & Joseph 1999). In the study by Steger and Frazier, conducted among the students of psychology, the meaning of life mediated between religious involvement and satisfaction with life (Steger & Frazier 2005). Another study, performed among Israeli students, revealed a mediating role of

the meaning of life between religious faith and psychological well-being or distress (Vilchensky & Kravetz, 2005).

A patient with illness such as cancer, heart failure, chronic lung problems, kidney disease, stroke, AIDS, conditions like Parkinson's disease, the last stages of Alzheimer's and similar conditions is referred to as terminal ill patient (Glare et al.. 2003).

The present study explore the health related quality of life negative emotional states and spiritual well-being in a sample of treatment group (Cancer patients) and control group between 40 and 65 years of age. The 150 cancer patients and 161 control participants in the middle adulthood (Erikson, 1968) with proportionate representation of 'sex' (170 male and 141 female), matched or equated on the demographic variables of age, occupational status, educational qualification, marital status, socioeconomic status, number of family members, number of children, number of siblings, birth order, breadwinner, number of bread earners and monthly family income, served as participants for the study. The study employed 2 'treatment' (cancer patients & control group) x 2 'sex' (male & female) factorial design.

The first phase of interaction was followed by data collection; the later was followed by introspective report and de-briefing. During the course of the data collection, there were approximately 500 booklets distributed and handed out, face to face interviewed was conducted in most of the participants and others were recollected.

For the present study, RAND-36 (Research and Development; Measure of Health-Related Quality of Life; Hays & Morales, 2001), Depression Anxiety and Stress Scale (DASS; Lovibond, Lovibond, 1995) and Spiritual Health and Life Orientation Measure (SHALOM; Fisher, 2010) were employed.

The responses of the participants after careful screening, cleaning and coding are processed with statistical packages. However, the assumptions of normality and homogeneity of variance was violated by the data set. Therefore, a non-parametric comparison of the 2

treatment (cancer patients & control group) X 2 sex (male & female) factorial design was employed.

Firstly, U-test was employed to compare the treatment with the control group as well as the male & female on health conditions, negative emotional states & spiritual well-being. Secondly, Kruskal Wallis one way analysis of variance was employed to compare the participants under four cells of the 2 treatment (cancer patients & control group) X 2 sex (male & female) factorial design. Thirdly, Steel-Dwass test which is a non-parametric Post-hoc multiple comparison was employ to discern the patterns of differences under the four cells of the 2 treatment (cancer patients & control group) X 2 sex (male & female) factorial design for the significant Kruskal Wallis one way analysis of variance.

Finally, series of binary logistic regression in the prediction of each of the individual health related quality of life (physical functioning, physical role limitation, emotional role limitation, energy/fatigue, emotional well-being, social functioning, pain & general health) from the demographic variables (sample, sex, age, occupational status, educational qualification, marital status, number of family members, number of children, number of siblings, birth order, bread winner, number of bread earners and monthly family income) all of which are entered as the predictors in Block-1; the negative emotional states (depression, anxiety and stress) all added as a predictors in Block-2; and the sub-scales of spiritual well-being (personal, communal, environmental and transcendental) are finally added as predictors in Block-3.

The findings revealed that ‘treatment’ group shows better socio-economic status, health related quality of life and indicate higher level of depression and stress as reported in literature (Marmot et al., 1984). The study also revealed that being in the treatment group indicate larger family structure and better personal, communal, environmental and

transcendental spiritual well-being (Milligan, 2004; Spiritual Care Work Group of International Work Group on Death Dying and Bereavement, 1990; Thomson, 2000; Wesley, 2004).

Dominance of female emerges on negative emotional. Even when women and men are confronted with similar stressors, women may be more vulnerable than men to developing depression and related anxiety disorders such as posttraumatic stress disorder. Women's greater reactivity compared with men's has been attributed to gender differences in biological responses, self-concepts, and coping styles (Breslau et al., 1997; Nolen-Hoeksema, 2001).

Higher age group indicates larger family structure and better spiritual well-being whereas, lower age indicates better health related quality of life (Charles & Carstensen, 2009; Depp, Vahia, & Jeste, 2010; Fratiglioni et al., 2004; Friedman et al., 2010; Gow et al., 2007; Okabayashi et al., 2004). Results revealed that better occupation indicate better health related quality of life (Zyoud et. al., 2015; Liu et. al., 2015; Zahran et. al., 2003; Ishibashi et. al., 2013) and higher educational qualification indicate lower spiritual well-being and better health related quality of life (Ross & Myrowsky, 2006; Antonio Muñoz-García, María José Aviles-Herrera, 2014). Being the bread-winner indicate anxiety and lower level of health related quality of life, better income indicate better health related quality of life and lower spiritual well-being. Results show that larger numbers of bread earners indicate better socio-economic status and health related quality of life.

The indicators of family structure are positively related between each other and indicate lower level of health related quality of life. Findings from the present study also indicate that physical functioning, physical role limitation, emotional role limitation, pain and general health to be negatively related with depression, anxiety, stress and spiritual well-

being. Energy/fatigue, emotional well-being and social functioning emerged to be positively related with personal, communal, environmental and transcendental spiritual well-being.

Findings from the present study also revealed negative emotional states to be negatively related with spiritual well-being and higher negative emotional states indicate lower health related quality of life. Finally, the study revealed higher spiritual well-being to indicate better health related quality of life (House, Landis, Umberson, 1988; Krause 1997 & Paykel, 1994).

In sum, the study supports the evidences that relate the experiences of cancer patients in areas of health related quality of life, negative emotional states and spiritual well-being. The outcomes of the study evinced the need for further research regarding intervention strategies that are individually tailored for family members vulnerable to illnesses.

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Appendix – I

Code: .....…….....
……...
……...

DEMOGRAPHIC PROFILE

Please fill up the following as applicable:

1. Sex: ☐ Male ☐ Female

2. Age: _____ (in figures)

3. Occupation: Retired (Post held on retirement _____)

   Employed (Present post held _____)

4. Highest Education status:
   - ☐ Profession or Honours
   - ☐ Graduate or Post-Graduate
   - ☐ Intermediate/Post High School Diploma
   - ☐ High School Certificate
   - ☐ Middle School Certificate
   - ☐ Primary School Certificate
   - ☐ Illiterate

5. Marital status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed

6. Number of family members: _____ (in figures)

7. Number of children: a) Total _____ (in figures) b) Living with _____ (in figures)

8. Number of siblings: a) Total _____ (in figures) b) Live _____ (in figures)

9. Birth Order: _____ (in figures)

10. Breadwinner in the family: ☐ Self ☐ Spouse ☐ Others

11. Bread-earners in the family (Respond/tick all those applicable):

    Self Spouse ☐ Others ☐ ☐

    Please indicate number of bread-earners in the family: _____ (in figures)

12. Total family income (approx.): Rs. _____ (in figures)

GENERAL INSTRUCTIONS

There is no “right” or “wrong” answer as everyone has right to his or her own views. To be able to give the best response, please answer them exactly and truly.

When you answer, keep following the following four points in mind:-

1. Give the first, natural answer as it comes to you. Do not spend too much time thinking about your answers.

2. Try not to fall back on the middle, “undecided” answers except when the answer at either ends are really impossible for you.

3. Be sure not to skip anything and answer every statement, somehow.

4. Answer as honestly as possible what is true for you. Do not merely mark what seems “the right thing to say” just to impress the examiner.

Appendix – II

RAND-36

1. In general, would you say your **health is**?

1 Excellent 2 Very good 3 Good 4 Fair 5 Poor

2. **Compared to one year ago**, how would you rate your health in general **now**?

1 Much better now than one year ago 2 Somewhat better now than one year ago 3 About the same 4 Somewhat worse now than one year ago 5 Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?		**Yes, Limited a Lot**	**Yes, Limited a Little**	**No, Not limited at All**
3	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.	1	2	3
4	Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.	1	2	3
5	Lifting or carrying groceries.	1	2	3
6	Climbing several flights of stairs.	1	2	3
7	Climbing one flight of stairs.	1	2	3
8	Bending, kneeling, or stooping.	1	2	3
9	Walking more than a mile.	1	2	3
10	Walking several blocks.	1	2	3
11	Walking one block.	1	2	3
12	Bathing or dressing myself.	1	2	3
During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?			**Yes**	**No**
13	Cut down the amount of time you spent on work or other activities.		1	2
14	**Accomplished less** than you would like.		1	2
15	Were limited in the **kind** of work or other activities.		1	2
16	Had **difficulty** performing the work or other activities (for example, it took extra effort).		1	2
During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of anyemotional problems** (such as feeling depressed or anxious)?			**Yes**	**No**
17	Cut down the **amount of time** you spent on work or other activities.		1	2
18	**Accomplished less** than you would like.		1	2
19	Didn't do work or other activities as **carefully** as usual.		1	2

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?

1 Not at all 2 Slightly 3 Moderately 4 Quite a bit 5 Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

1 None | 2 Very mild | 3 Mild | 4 Moderate | 5 Severe | 6 Very Severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

1 Not at all | 2 Slightly | 3 Moderately | 4 Quite a bit | 5 Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks . . .

23. Did you feel full of pep?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

24. Have you been a very nervous person?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

25. Have you felt so down in the dumps that nothing could cheer you up?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

26. Have you felt calm and peaceful?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

27. Did you have a lot of energy?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

28. Have you felt downhearted and blue?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

29. Did you feel worn out?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

30. Have you been a happy person?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

31. Did you feel tired?

1 All of the time | 2 Most of the time | 3 A good bit of the time | 4 Some of the time | 5 A little bit of the time | 6 None of the time

32. During the **past 4 weeks**, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

1 All of the time | 2 Most of the time | 3 Some of the time | 4 A little of the time | 5 None of the time

How **TRUE** or **FALSE** is each of the following statements for you.

33. I seem to get sick a little easier than other people

1 Definitely True | 2 Mostly True | 3 Don't Know | 4 Mostly False | 5 Definitely False

34. I am as healthy as anybody I know

1 Definitely True | 2 Mostly True | 3 Don't Know | 4 Mostly False | 5 Definitely False

35. I expect my health to get worse

1 Definitely True | 2 Mostly True | 3 Don't Know | 4 Mostly False | 5 Definitely False

36. My health is excellent

1 Definitely True | 2 Mostly True | 3 Don't Know | 4 Mostly False | 5 Definitely False

Appendix – III

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix – IV

SPIRITUAL HEALTH AND LIFE ORIENTATION MEASURE (SHALOM)

Spirituality can be described as that which lies at the heart of a person being human. Spiritual well-being can be seen as a measure of how good you feel about yourself and how well you relate to those aspects of the world around you which are important to you.

Procedure/guidelines:
(a) in your opinion, rate how important to you to achieve spiritual well-being, and
(b) in each line, rate how you feel each item reflects your personal experience most of the time

Please give two answers for each line. Make a circle around the number for your answer from these two columns.
The answers were ranked as follows:-

1 – Very low 2- low 3- average 4-high 5- very high

Do not spend too much time for one line. It is best to answer the first thing that comes to your mind.

Items	**Ideals for Spiritual health**	**How it reflects your live experience**
1. Love other people	1 2 3 4 5	1 2 3 4 5
2. Relationship with God	1 2 3 4 5	1 2 3 4 5
3. Forgiveness toward others	1 2 3 4 5	1 2 3 4 5
4. Connection with nature	1 2 3 4 5	1 2 3 4 5
5. Sense of Identity	1 2 3 4 5	1 2 3 4 5
6. Worship of the Creator	1 2 3 4 5	1 2 3 4 5
7. Awe at a breathtaking view	1 2 3 4 5	1 2 3 4 5
8. Trusts between individuals	1 2 3 4 5	1 2 3 4 5
9. Self awareness	1 2 3 4 5	1 2 3 4 5
10. Oneness with nature	1 2 3 4 5	1 2 3 4 5
11. Oneness with God	1 2 3 4 5	1 2 3 4 5
12. Harmony with the environment	1 2 3 4 5	1 2 3 4 5
13. Peace with God	1 2 3 4 5	1 2 3 4 5
14. Joy of life	1 2 3 4 5	1 2 3 4 5
15. Prayer life	1 2 3 4 5	1 2 3 4 5
16. Inner peace	1 2 3 4 5	1 2 3 4 5
17. Respect for others	1 2 3 4 5	1 2 3 4 5
18. Meaning in life	1 2 3 4 5	1 2 3 4 5
19. Kindness towards other people	1 2 3 4 5	1 2 3 4 5
20. Sense of magic in the environment	1 2 3 4 5	1 2 3 4 5
*How important is religion in your life	1 2 3 4 5	1 2 3 4 5
*How important is spiritual life in your life	1 2 3 4 5	1 2 3 4 5