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The Adaptation To Head And Neck Cancer In The Veteran Population

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ADAPTATION TO HEAD AND NECK CANCER IN THE VETERAN POPULATION: A PILOT STUDY

by

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CHAPTER 1: ADAPTATION TO HEAD AND NECK CANCER IN THE VETERAN POPULATION: A PILOT STUDY

Introduction

Head and neck cancer is recognized as one of the top ten cancers in Veteran Affairs facilities nationwide with occurrence rates between 12% and 20% (Veterans Administration Puget Sound & Minneapolis Health Care System Cancer Registry Database, 2013). In fact, the Veterans Administration at Puget Sound and Minneapolis verify incident rates at 21.2% and identify head and neck cancer as the third most common solid tumor cancer. In comparison, a report on the percent of all new civilian head and neck cancer cases nationwide ranges 4 - 8% (The National Cancer Institute Surveillance, Epidemiology and End Results Report [SEER], 2017). The military is unique in that experiences that occur in theater alter the perception that characterizes the development of everyday life and events.

The combined military experiences of exposure to military conflict, environmental toxins, and traumatic conditions are often associated with manifestations of post-traumatic stress disorder (PTSD) in veterans (PTSD: National Center for PTSD, 2013). Different environments and war zones are linked to adverse physical and mental health outcomes such as post-traumatic stress disorder, depression, and anxiety (PTSD: National Center for PTSD, 2013). Traumatic combat events can lead to post-traumatic stress disorder which have been identified in: 19% - 30% of Vietnam Veterans, 10% of Gulf War (Desert Storm) veterans, 6%-11% of Afghanistan (Enduring Freedom) veterans, and 12% - 20% of Iraq (Iraqi Freedom) veterans (Veterans Health Library, 2013). Drexler, Merz, Hamacher-Dang, Tegenthof, & Wolf (2015) found that attention to

threat and combat activity is associated with a neurobiological response releasing cortisol, a hormone that strengthens memories of traumatic incidences or events that cause fear. Flashback memories will cause a surge in cortisol levels reconsolidating the memory while encoding neurons (Drexler et al, 2015). Studies provide evidence that the occurrence of PTSD may be comorbid with depression and correlate with higher rates of head and neck cancer related to environmental exposures and stressors experienced while in military service (Cordova, Riba, & Spiegel, 2017; Wang, Caughron, & Young, 2017; Armaiz-Pena, Cole, Lutgendorf, Sood, 2013).

The symptoms of cancer in the head and neck area can cause anxiety brought on by sensory stimuli dysfunction leading to an inability to perform normal physical activities for survival. Additionally, head and neck cancer may cause psychosocial withdrawal due to disfigurement in the visible area of the head and neck. The individual prone to anxiety has excessive worry causing a surge of neurochemicals in the system. These neurochemicals /neurotransmitters transport through the hypothalamus, pituitary, adrenal (HPA) axis of the brain and adrenal glands causing a decrease in specific neurotransmitters leading to depression. The stress hormone cortisol, released from the adrenal cortex, maintains certain physiologic functions such as regulating blood pressure, blood sugar, decreasing inflammation, supporting the immune system, and assisting in the utilization of energy input, thus regulating system homeostasis. Cortisol assists in hormonal changes related to stress and post-traumatic stress. While cortisol increases during the normal stress response, studies show that cortisol is lower in the PTSD population. An imbalance in cortisol levels creates symptoms related to fatigue, anxiety, depression, and memory dysfunction. Physiologically the process of adaptation is a

physical response to sensory stimuli experienced by the human system. Stimulation of the sensory structures is ever changing, constant, and impacted by environmental conditions. Many of the symptoms will affect an individual's quality of life while adapting to situations. The impact of a head and neck cancer diagnosis correlates with post-traumatic stress disorder, depression, and anxiety, as well as deviations in cortisol levels ultimately affecting the quality of life during the process of adaptation.

Statement of the Problem

This research evaluates the biophysical, psycho social and environmental changes that stimulate an adaptive response in the veteran with head and neck cancer experiencing occurrences of post-traumatic stress disorder symptoms. The literature review of available studies focused on the following variables: head and neck cancer, military post-traumatic stress disorder, depression, and adaptation. Cortisol, as related to anxiety, depression, and stress is foremost in the homeostatic process of adaptation. The symptoms of post-traumatic stress disorder and head and neck cancer are associated with some of these same symptoms involved in anxiety, depression and cortisol function. Therefore, inclusion of the concept cortisol involved in the stress and depression response cycle were reviewed, as part of the process leading to re-occurrence of post-traumatic stress disorder and as a part of the symptomatology of head and neck cancer and depression.

Cancer

Cancer is a genetic disease that leads to abnormal unrestricted cellular growth (Holland & Frei, 2010). Cancer is diverse in its origins and is identified when an excess of aberrant cells accumulates. These cells are not the same as a hypertrophy or

hyperplasia of normal cellular growth, nor do these cells obey biological system rules or function independently of normal tissues. The occurrence of cancer ignores anatomical arrangement-- attacking and invading adjacent tissues. Mechanical invasion is accompanied by biochemical alterations that disturb molecular instruction causing mutation of the genetic code and cellular disorder (Hao, Xian-Xiang, Hua-Ming, Nuo, Dai-You, Jaian-Bo, Liang-Hui, 2017; Armaiz-Pena, Cole, Lutgendorf, Sood, 2013). As abnormal cells proliferate, symptoms occur as a result of the cellular differentiation, growth, and effect on surrounding structures.

Abnormal cell proliferation creates change in the normal physical/psycho-social environment of an individual. According to Denaro, Tomasello, & Russi (2014), a physiologic stress response is a mediator of psychosocial factors on cancer progression. Over time there is a change in functional ability leading to psychological distress, which alters social interaction. The general physiologic response occurs in activation of the "fight or flight" reaction system, releasing the neurotransmitters epinephrine and norepinephrine from the sympathetic nervous system and the adrenal glands. The result of this activation causes secretion of adrenocorticotrophic hormones from the anterior pituitary releasing the glucocorticoid hormone, cortisol, from the adrenal cortex. Cortisol belongs to the class of steroid hormones that modulate immune activity and inflammatory reaction and is secreted in response to stress (Moreno-Smith, M., Lutgendorf, S. L., & Sood, A. K., 2010). Studies show that stress interrupts "neuroendocrine circadian rhythms in ways that favor tumor growth and metastasis (pg.3)" (Moreno-Smith, et al, 2010).

Symptoms in the early stages of cancer mimic other non-cancerous disease processes and are generally treated by clinicians as such. For instance, cancer disease symptoms correlate with many other disease processes and symptoms experienced in military exposures to environmental and chemical toxins, lifestyle activities, home and work place situations, tobacco, alcohol, and drug use. Because head and neck cancers are diverse in presentation due to the landscape of the head and neck, multiple tissue types and the distinct sensory functions become the primary treatment foci, which is, symptom care. Only after failed symptom treatment does further in depth testing occur that verifies pathological changes and cancer diagnosis (Holland & Frei, 2010).

The complexity of head and neck cancer is based on the defined anatomy and physiology of the human. The focus of this study places pathological changes and cellular/tumor growth in the areas above the clavicle/scapula to the top of the head not including the brain. Pathologic changes and the treatments offered compromise notable appearance and functional ability. Treatments for cancerous lesions with symptoms that accompany cellular changes include surgical disruption of tissues and multiple effects of antineoplastic radiant and chemical treatments (Holland-Frei, 2010).

According to Holland-Frie (2010), the following effects of a head and neck cancer diagnosis are based on cellular changes resulting in tumor growth causing sensations of a "lump or occlusion" in the area of the head and neck which impedes physical function. Growths cause tenderness and pain due to structural change and deformity. Treatment options include surgery, chemotherapy, and radiation. Surgical procedures invade soft tissue, muscle, and bone where there is a disruption of the anatomical ability to act according to physiologic norms inherent in the system process, which correlates to tissue

trauma, swelling, and inflammation. Radiation treatments impact areas causing edema, fibrosis, and necrosis of tissues. Chemotherapeutic agents have been found to increase inflammation, cellular death, edema, and fibrosis. The pathologic changes that occur in this population of patients cause visible changes and functional disabilities. This study focused on researching the gap between these changes and the effects of symptoms of post-traumatic stress disorder associated with the cancer disease process.

Post-Traumatic Stress Disorder

Post-traumatic stress disorder occurs when exposure to a traumatic life-threatening event is experienced. In the United States, the rate of post-traumatic stress disorder in the general population ranges from 6.8% to 12.3% (U.S. Department of Veterans Affairs, 2013). The symptoms of post-traumatic stress disorder can be emotional and physical. Emotional symptoms can be nightmares, flashbacks, vigilance, hyperarousal, re-experiencing traumatic events, anxiety and depression, emotional pain, persistent fear, irritability, guilt, and avoidance of objects or situations. Physical symptoms include chronic physical pain, headaches (migraines), vertigo, fatigue, chest pain, trouble breathing, and digestive issues. PTSD symptoms can be triggered by a thought, smell, noise, visual cue, sensation, or taste. Individuals who experience PTSD may withdraw from social situations and interests and seek out risk taking behaviors. The military population, however, suffers more noticeably, based on specific war exposures. According to Lawson (2014), epidemiology identifies the risk for development of PTSD with an association between cumulative combat intensity, personal injury, and/or witness of other injury or death, and prolonged or frequent tours of duty. The estimated lifetime prevalence of PTSD in Vietnam veterans is 30.9% (males), Gulf War veterans is 12.1%

(males and females), and in Operation Enduring Freedom/Operation Iraqi Freedom veterans is13.8% (males and females) (U.S. department of Veterans Affairs, 2013). PTSD is a complex process that affects the physical, psychological, and behavioral qualities of an individual (Ciechanowski & Katon, 2012). Friedman (2013) notes individuals with post-traumatic stress disorder have an 80% chance of being diagnosed with depression. In a meta-analysis by Rytwinski, Scur, Feeny, and Youngstrom (2013), 52% of individuals with PTSD have a major depressive disorder, with military persons demonstrating higher rates. According to Ciechanowski & Katon (2012), PTSD has also been associated with multiple physical illnesses such as cardiac disease, peripheral vascular disease, liver disease, and lung disorders. Researchers Li, Fitzgerald and Rodin (2012), discuss depression as being highly comorbid with cancer. Wachen, Patidar, Mulligan, Naik, & Moye (2014) report PTSD diagnosed veterans with head and neck cancers have increased post-traumatic stress symptoms and up to 35% of the symptoms are related to diagnosis, treatments, advanced cancer stages, and psychiatric history.

The documented manifestation of head and neck cancer in the military population align with high incidents of both depression and PTSD symptoms (Cordova, Riba, Spiegel, 2017; Abdullah, Jaafar, Zakaria, Rajandram, Mahadevan, Yunus, Shah, 2015; Armaiz-Pena, Lutgendorf, Cole, & Sood, 2013). According to Haman (2008), individuals with cancers of the head and neck have a 19% - 40% rate of depression and anxiety. The evidence is linked to the influence of the metastatic components in the neuro-biochemical process of the central and peripheral nervous systems (Moreno-Smith, et al., 2010). Studies frequently show an association between psychiatric and medical diagnosis via assorted bio-psychosocial mechanisms (Abdullah, Jaafar, Zakaria, Rajandram,

Mahadevan, Yunus, Shah, 2015). There is correlation between cancer, depression, and PTSD that is validated in a study by Abdullah et al., (2015), and indicates an inverse relationship: quality of life deteriorates during treatments for head and neck cancer, but increases following treatments. The physiologic process of post-traumatic stress disorder, depression and cancer has been documented in recent research. The gap in knowledge is: how the symptoms associated with military PTSD and the symptoms associated with illness PTSD relates to the symptoms of the disease process? And is PTSD in the disease process correlated with military and civilian PTSD experiences?

Post-Traumatic Stress and Physiologic Response

There are also physiological responses involving neurotransmitters to stress in PTSD. Lehrner and Yehuda (2014), describe PTSD as a "complex interplay at multiple biological levels with environmental and psychological stimuli" (pg.2). Top down neurochemical responses occur when perceived input of cranial nerve activation transmits impulses to the thalamic/hypothalamic pathway for processing and encoding. The multistep process stimulates a neuroendocrine response releasing the stress hormone cortisol. Repeated hits of cortisol cause a feed-back/feed-forward effect in the presence of the symptoms of PTSD. When cortisol is released in response to stress, the body's metabolic rate is supported to maintain system functions. Cortisol is associated with PTSD, fear conditioning, and major depression (VanElzakker, Dahlgren, Davis, Dubois, & Shin, 2013). Exposure to repetitive bio-psycho-social events where adaptation to the same stressors causes habituation to occur, over time, causes an inadequate response leading to a lack of adaptation (Friedman, 2001, National Center for PTSD). Biologically multiple stressors occurring in the body alter the hypothalamus pituitary adrenal (HPA)

pathway and autonomic nervous system (ANS) potentially causing depression, post-traumatic stress, as well as possibly prompting stress-induced neuroendocrine responses on cancer initiation and progression (Armaiz-Pena, et al, 2013). An imbalance in the levels of neurotransmitters may influence mood and lead to symptoms associated with depression. It is recommended that any measurements related to PTSD should incorporate a biomarker for diagnosis and severity of disease (Lehrner & Yehuda, 2014). In the Lehrner & Yehuda study, a decrease in cortisol after trauma exposure was a predictor of the development of PTSD.

Disease biomarkers refer to certain characteristics that can be objectively measured and evaluated in a biologic, pathogenic, or pharmacologic process (Lehrner & Yehuda, 2014). PTSD symptoms are related to a dysregulatory biological response to stress. Brenner (2011) looked at specific symptoms and the response in brain regions, neurochemical activation of neurotransmitters, and the neuroendocrine system. Delineation of specific PTSD symptoms offer the following insight: 1) during the process of re-experiencing, the amygdala and insula are over activated, and cortisol, glutamate, and norepinephrine are released, 2) during the process of hyper arousal symptoms, the amygdala and thalamus are over activated stimulating cortisol, dopamine, epinephrine, and norepinephrine, from the adrenals and 3) during the process of avoidance/numbing/dissociation the prefrontal cortex and superior temporal cortex are over activated stimulating the neurochemicals beta-endorphins from the pituitary gland, spinal cord, brain and nervous system; cortisol from the adrenal glands; dopamine and glutamate neurotransmitters in the brain and nervous system. The studies by Lehrner and Yehuda (2014) show decreased cortisol levels immediately after trauma predicting the

development of PTSD and pre-exposure dysregulation down glucocorticoid signaling pathways.

Post-traumatic stress and military experiences are best explained in relation to the biological insults leading to injuries. Delineating military events are seen in the neuro-biological experiences that occur along the sensory pathway from perception of an incident to the neurological processing. For instance, blast, chemical, and radiant exposures invoke a perceived response from multiple sensory pathways. As blast, chemical, and radiant threats attack the neuro-biochemical pathway, the homeostatic environment adjusts. The neurological pathway transmits information from the environment to the central nervous system and back to the peripheral nervous system via the neuro-chemical transportation of cortisol and inducing neuro-information exchange in cells, tissues, and organs. The human system is limited in its physiologic response to sensory insult. With repeated hits of the same sensory offenses the physiologic response is continuously on point in an effort to maintain homeostatic stability. Over time the neuro-chemicals involved reset. The gap in knowledge is what is the effect on system biomarkers over time.

Post-Traumatic Stress and Cancer

Post-traumatic stress disorder affects the individual similarly to other disease processes. For example, they experience chronic pain, migraines, shortness of breath, digestive issues, vertigo, and fatigue, et cetera. PTSD is cited in the Diagnostic and Statistical Manual of Mental Disorders V (Rosellini, Stein, Colpe, Heeringa, Petukhova, Sampson, 2015) as a psychiatric disorder that can develop after a traumatic event that threatens serious injury or death and is depicted by heightened arousal, invasive thoughts,

emotional detachment, and averting reminders of the traumatic event. The pathway for neurotransmission of perceived environmental experiences is related to the release of the same neuroendocrine transmitters involved in cancer diagnosis and treatments. Head and neck cancer can be perceived as a life threatening, life-changing event that requires invasive and unpleasant treatments. Stress symptoms related to neurological transmitters are felt as a threat when disease and interventional treatments are experienced. In 1994, the American Psychiatric Association qualified cancer as a traumatic event and, according to Posluszny & colleagues (2014), included the disease in the DSM-IV under the diagnosis of PTSD by the American Psychiatric Association (Posluszny, Dougall, Johnson, Argiris, Ferris, Baum…Dew, 2014). The correlation between cancer and PTSD is seen in health related consequences affecting the bio-psycho-social system. Two specific over-riding symptoms are anxiety and depression. Current literature has researched PTSD symptoms in the cancer survivor, identifying "cancer-related PTSD" in up to 35% of the corresponding population (Wachen, et al, 2014).

The study of biological signaling pathways in response to cancer disease is significant in showing psychological response factors, such as stress, associated with the diagnosis of cancer. These response factors influence neural-biochemical pathways to generate crosstalk between stress-related neuro-biochemical processes that impact the tumor and stromal cells downstream signaling pathways in the progression of disease (Lutgendorf, Sood, & Antoni, 2010; Moreno-Smith, et al, 2010; Thaker & Sood, 2008). Stress hormones prompt the migration of tumor cells by increasing the production of matrix metalloproteinase (MMP) production (Lutgendorf, et al, 2010). As norepinephrine (rest and digest) and epinephrine (fight or flight) increase MMP production, head and

neck tumor cells increase growth and migration activities. Clinically, these bio-chemicals increase depression and stress, which promotes a pro-inflammatory environment. Stress causes the dysregulation of the neuro-endocrine hormone, cortisol, to have an effect on functional ability. Symptoms related to physical changes (shortness of breath, dysphagia, pain, digestive issues, fatigue, et cetera) reflect symptoms of PTSD. There is limited research related to military PTSD versus civilian PTSD versus illness/sickness PTSD. The gap in knowledge is: are PTSD symptoms triggered by the physical changes or are the symptoms of physical changes a response to the disease process and treatments, therefore triggering an illness/sickness PTSD response?

Depression and Anxiety

Depression occurs when a change in life circumstances happens that is perceived as a sudden, traumatic, or difficult lifetime event or experience. According to Friedman (2001), eighty percent of veterans diagnosed with post-traumatic stress disorder have a secondary psychiatric diagnosis, which is depression. Cancer literature examines the PTSD experience and cites that as many as 35% of cancer survivors are diagnosed with PTSD (Wachen, et al, 2014). According to Posluszny, et al (2014), depression in the head and neck cancer population is reported in 20% to 46% of the population.

The incidence of depression is as high as 44% in the head and neck cancer population (Moubayed, S., Sampalis, J., Ayad, T., Guertin, L., Bissada, E., Gologan, O.… Christopoulos, A. 2015). Depression is linked to the specific body system failure (tumor location), endocrine, and neurological complications of cancer (Holland & Frei, 2010). Tumor induced pro-inflammatory cytokines may induce fluctuations of neurotransmitters that effect physiologic response causing anxiety and depression

(Armaiz-Pena, et al, 2013; Low & Bovbjerg, 2014). The individual who has a pre-existing diagnosis of post-traumatic stress disorder is at risk for anxiety inducing painful flashback experiences and memories. Anxiety related to the diagnosis of cancer and the treatment trajectories have been associated with physical symptoms that occur and are reflective of post-traumatic stress disorder. Psychosocial symptoms in the cancer population may be related to the cytokine effects of "disease behavior" and are seen in the physical symptoms of depression and cognitive changes (Gregurek, Bras, Dordevic, Ratkovic, & Brajkovic 2010). The biological production of specific neurotransmitters produced in the system creates these symptoms based on perception of events that occur at each experience. As sensory signals activate a biochemical response, does the response trigger a PTSD reaction or are the symptoms associated with the disease behavior alone. If the symptoms are disease specific, do they generate an "illness/sickness" PTSD response?

Adaptation

Adaptation is defined as the ability of an organism to maintain and/or change within its environment in order to survive (Von Bertalanffy, 1950). Wartime trauma involves significant environmental and social change that is dynamic, progressive, and endless. Biological adaptation is a selective process that incorporates behaviors as part of the evolutionary process of the soldier for survival (Coelho, et al, 1974). Stress reactions are individualized to discrete experiences involving predictable biological pathways, as well as unpredictable and uncontrollable psychosocial encounters. The psychosocial events often involve moral meaning and worth that magnify helplessness and futility having a direct impact on the ability to adapt. The capacity of military persons to

acclimate quickly to danger, stress, and battle is identified as resiliency and is effectively demonstrated in the capability to adapt to physical, psychological, and social stress during wartime.

Treatments for head and neck cancers are surgical intervention, chemotherapeutics, radiation treatments, or some combination of these. Surgical resection is technically difficult because of anatomical location and frequent bilateral node involvement. Surgical intervention changes the topography of the head and neck area at multiple levels and at many degrees of physical disruption changing the visible representation of the person (Callahan, 2008). Chemotherapy and radiation treatments change the physical appearance of the person by causing skin discoloration, fibrosis, and cellular death. Single and multimodal treatments inhibit the ability of the neurologic function of the body systems and senses. For example: headaches, fistula formations, mucosal changes, and necrosis lead to bio-psychosocial symptoms related to epinephrine/norepinephrine and adrenal cortical response (Sterling, 2003; Ganzel, Morris, & Wethington, 2010). The system acts in a feedback/feed forward response creating a cyclical reaction. In other words, the system responds with repetitive hits of similar symptoms identified as tachycardia, shortness of breath, fatigue, gastrointestinal distress, and diaphoresis. Physical and structural changes occurring in the head and neck area affect the ability of the individual to adjust to daily living.

The capacity to maintain and control an acceptable quality of life in the adaptation process is influenced by specific situations and occurrences of trauma to the head and neck. These situations and traumas correlate with exposure to blunt injury or any chemical/biohazard/warfare that overpowers an individual. Post-traumatic stress disorder

follows traumatic experiences thru specific symptoms identified as re-experiencing, hyper arousal, hyper vigilance and anxiety (Wang, Z., Caughron, B., & Young, M. 2017). In these situations, the linear order of post-traumatic stress disorder and the trauma caused by cancer of the head and neck area influence the individual's ability to adjust and acclimate to normal life experiences, as both the subject's appearance and the way they perform activities of daily living are drastically changed. The adaptive response compromises the personal ability to maintain the self and quality of life. Research is limited regarding the military population and the human systems response to PTSD and cancer. Does a diagnosis of PTSD and cancer compromise the ability to adapt to life situations, maintain the self and quality of life in the military population?

Quality of Life and Adaptation

Quality of life can be defined as a person's overall life satisfaction with the environment, ability to perform activities, emotional wellbeing, physical health, social relationships, and goal attainment (Barrois, Bravo, Gil-Montoya, Martinez-Lara, Garcia-Medina, & Tsakos, 2015; van Nieuwenhuizen, Buffart, Brug, Leemans, Verdonck-de Leeuw 2015). If quality of life is affected by the ability to function in a physical, psychological, and social environment, then the manifestation of cancers of the head and neck are detrimental to body system functions and life sustenance. The ability to perform life-sustaining functions such as breathing, mastication, swallowing, smelling, verbal communication, vision, and hearing are concentrated in the head and neck area. Along with supporting life these activities are visible to the general population and play a large role in social involvement (Callahan, 2008). The effects of treatments on the face, head, and neck leave surgical wounds, landmark changes, and tissue destruction which can

increase the incidence of psychological disturbance (Bonacchi, Rossi, Bellotti, Franco, Toccafondi, … Rosselli, 2010). According to Bonacchi, et al (2010), this psychological disturbance, if left undiagnosed and untreated, can lead to exacerbation of symptom suffering, increased hospitalizations, decreased compliance to treatment protocols, and a reduced quality of life associated with physical changes related to fulfilling adaptive behaviors necessary to maintain life sustaining function.

Somatic adaptation of a system is accomplished through the interaction of the body with the environment (Coelho, Hamburg, Adams, 1974). According to Coelho and colleagues, this leads to interaction within multiple body systems. Changes in one part of the system will alter other system functions in an effort to adjust and maintain an internal steady state. As the internal physical system works towards maintaining homeostasis, order is sustained via sensory, central and motor system functions (Lazarus & Folkman, 1984). When the somatic system adjusts to its internal and external environment, the physical changes align with the ability to maintain activities of daily living. The inability to continue to function within the learned behavioral norm may lead to maladaptive adjustments that modify an individual's perceived personal satisfaction with the conditions in which the person lives or their quality of life.

Quality of life is perceived from the individual's point of view. It is person specific and includes the whole body (mind and spirit), and encompasses the impact of disease, treatments and their side effects (Calman, 1984). According to Calman (1984), a good quality of life should match the individual's hopes and aspirations at any given moment in time. Therefore, it is fluid and ever changing. Zatzick, et al, (1997), comments that the occurrence of PTSD increased with self-reports of chronic disease. Furthermore,

reports demonstrated that subjects with PTSD had greater than 20% higher risk for functional impairment, diminished wellbeing, fair or poor physical health, and increased physical limitations (Zatzick, Marmar, Weiss, Browner, Metzler, Golding, … Wells, 1997).

The findings from this study will add to an understanding of perceived traumatic stress correlated with depression affecting the quality of life in the head and neck cancer veteran. The gaps in the literature are: how does the human perception of a traumatic event lead to PTSD and trigger a cascade of biological events changing the homeostatic load?

Statement of the Purpose

Few studies looked at the bio-psycho-social experience related to the diagnosis and treatments of head and neck cancer and depression in the presence of military PTSD. Clinical observations identify a correlation between head and neck cancer and depression on those individuals exhibiting symptoms of PTSD. Data shows an association between PTSD and depression; head and neck cancer and depression; as well as, head and neck cancer treatment modalities on depression. What is the effect of a diagnosis of head and neck cancer and the treatment modalities on depression in the veteran who suddenly presents with symptoms of PTSD? There is little data regarding the variables of PTSD, head and neck cancer, and depression influencing adaptation and quality of life. This study analyzes the effects of cancer diagnosis and treatment, post-traumatic stress disorder, and depression in order to assist in further development of nursing treatment modalities that may benefit patient outcomes.

The challenge of head and neck cancer in the veteran population exhibiting symptoms of PTSD is to recognize the effects of the symptoms related to PTSD, such as depression and anxiety, that may be exacerbated by the diagnosis and treatment of head and neck cancer and impact quality of life. Haman (2008) suggests that quality of life depends on the response to treatments and survival after physical and psychosocial disruption experienced at time of diagnosis. This study will examine adaptations to head and neck cancer at time of diagnosis and initial treatments in veterans that may or may not be demonstrating symptoms of PTSD in order to better understand the impact on quality of life. The purpose of this research is to investigate the impact of head and neck cancer diagnosis and treatments on those individuals with or without symptoms of posttraumatic stress disorder, depression, anxiety, and quality of life of veterans during adaptation. The study attempts to increase our understanding of adaptation progression exhibited by veterans at initial diagnosis of head and neck cancer and treatment to determine how those individuals who may or may not experience PTSD and depression influence their recovery.

This study will utilize empirical investigations that focus on confirmation of PTSD, anxiety, depression, and quality of life. It is hypothesized that the physiologic process of head and neck cancer in conjunction with the diagnosis of PTSD changes adaptability. The planned study measures adaptation to head and neck cancer in the veteran with PTSD and without PTSD through questionnaires and surveys. The study proposes to: 1) assess adaptation to the diagnosis and treatment modalities for head and neck cancer in the presence of PTSD and depression, 2) assess the correlation between

anxiety, depression and PTSD, and 3) investigate the quality of life in the veteran diagnosed with PTSD at the time of and during head and neck cancer treatments.

Specific Aims and Research Questions

AIM1: Identify the occurrence of symptoms of PTSD at time of diagnosis and during exposure to treatments for head and neck cancer as evidenced by positive Post Traumatic Stress Disorder-Post traumatic stress disorder Checklist (PTSD-PCL) test scores.

Research Question 1A: Does the diagnosis of head and neck cancer impact the onset of PTSD symptoms as measured by the PTSD-PCL measurement tool?

AIM 2: Examine the occurrence of anxiety and depression at diagnosis and throughout the treatment courses for head and neck cancer.

Research Question 2A: Is there a correlation between anxiety and depression as measured by the GAD-7, and the PHQ-9 in the head and neck cancer patient at time of diagnosis?

AIM 3: Examine quality of life in the head and neck cancer patient with/without PTSD symptoms and undergoing treatments.

Research Question 3A: What symptoms are most frequently declared in head and neck cancer patients measured by the UW-QOL-HNC correlated with PTSD scores at initial diagnosis?

AIM 4: Examine the correlation between anxiety, quality of life, and PTSD throughout treatments for head and neck cancer.

Research Question 4A: What is the correlation between symptoms of anxiety, quality of life, and symptoms of post-traumatic stress disorder as measured by the

GAD-7, UW-QOL-HNC and the PTSD-PCL, in head and neck cancer patients at time of diagnosis?

AIM 5: Examine the feasibility and acceptability of a main research study on PTSD and head and neck cancer in the military population.

Research Question 5A: Is the military population amenable to research focused on PTSD and head and neck cancer as assessed by a small scale pilot study?

Significance

Investigating those individuals with symptoms of PTSD and those without symptoms of PTSD identified at time of cancer diagnosis and during treatments has the potential to identify which individuals are most likely to experience a decreased quality of life and maladaptation thus requiring early intervention. Exploring the correlation between head and neck cancer, PTSD, depression, and quality of life advances the science of neurobiology in clinical practice. The importance of this study, with a focus on specific symptoms of PTSD relative to the specific symptoms of head and neck cancer, will add to the science regarding the effects of PTSD, anxiety, depression and head and neck cancer on quality of life.

Chapter 2

Nursing Theory

Utilizing the four domains of nursing theory: person, environment, health, and nursing; the nursing profession is influential in evaluating and assisting individuals with disease processing and environmental demands. In the effort to evaluate adaptation to head and neck cancer in the veteran population, a middle range theory is formulated utilizing Hans Selye's (1950) theory of stress adaptation (General Adaptation Syndrome)

and Sterling's (1988), Eyer's (1988), McEwen's (1998), & Schulkin's (2003) theory of allostasis. Elements of the concepts identified in Roy's Theory of Adaptation are acknowledged because the nursing theory is a reciprocal interaction worldview of what occurs in humans under stressful conditions. The current formulated theory focuses on the physiologic pathways of the peripheral and central nervous system during and after a perceived event. Since the human is holistic and continually evolving in a constantly changing environment, a person is never the same at any one moment in time due to an active adaptive system. In this theory, attention is directed toward the ability of the human system to change behaviors to meet bio-psychosocial and environmental demands leading toward adaptive goals. Internal and external stimuli from the self and the environment create an open, continuously changing system representing an individual's own range of stimulus tolerance and adaptive responses (Roy & Roberts, 1981).

The human system is dynamic and seeks to maintain homeostatic control. A dynamic system is active, constantly adjusting to a fluctuating environment. The tendency of the system is to maintain internal stability or homeostasis. Homeostasis is never fully achieved; therefore, the human system continually works to maintain it. The outcome of the exchange is adaptation where, according to Roy & Roberts (1981), adaptive responses promote individual integrity regarding survival, self-mastery, and growth.

The development of a middle range theory of adaptation to head and neck cancer is a complex and interactive concept of interchange between physical, psychological, environmental and social experiences. The main theory focuses on the physiologic mode of adaptation where the interaction between the physical body and the environment is in

flux and the parameters of the biological system are defined: individuals adapt to certain stimuli based on their environment. The theory is cyclical and examines the production of neural-chemical-endocrine processes influenced by a perceived input into the sensory and peripheral nervous system. This process transfers to the central nervous system and initiates the production of the neurotransmitter, cortisol. The chemical transfers back into the peripheral nervous system to create a physical response. The integration of the peripheral and central nervous system affecting the physical system's processes regulate internal function and sustain life. Adaptation occurs as the body sustains a steady state. Figure 1 represents the continuous oscillating transfer of perceived experiences of external environment influencing the internal self and vice versa causing a stimulus tolerance and adaptive response.

General Adaptation Syndrome (G.A.S.) Theory

In the homeostatic balanced system, there is a stable state of self-regulation influenced by "negative feedback" (Steinberg & Rittman, 1990, pg. 4). The human system is self-regulating because input adjusts output and vice versa.

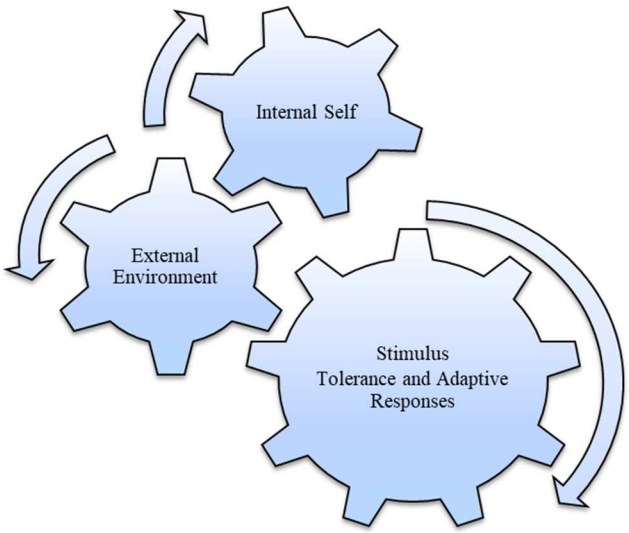

Figure 1. Perceived experience of continuous oscillating transfer of stimulus.

Each human system has its own value order that rules decisions and preferences. These inherent values match the internal fixed state. When input values to negative feedback

information parallel each other, a steady state is accomplished (Steinberg & Ritzmann, 1990).

Selye's (1950) G.A.S. theory states, all living systems function under a stress response. Selye (1950) defines stress as a "nonspecific response to a demand". Steinberg & Ritzmann, (1990) define stress as a scarcity- or excess of substance, power, or data that contributes or results in system production. A deficiency in nutrients, water, heat, sensory and social stimulus represents an output scarcity placing stress on the system. Whereas toxic substances, sensory, and nutrient excess are stimulus input overloads. Output underload and overload use similar stimulus of different forms. Therefore, stress is linked to input and output requirements. In humans, conflict between goals or purposes during input overload or underload produces a stress response.

The general adaptation syndrome involves three stages of adjustment: 1) the alarm reaction occurs during an unforeseen exposure to a stressor and the adjustment process involved; 2) the stage of resistance that maintains the adjustment including adjustment in the entire system not just the one system exposed to the stressor. In this stage the system is vulnerable to higher levels of the initial stressor, as well as other stressors; and 3) the stage of exhaustion due to continued over-exposure that includes the inability to uphold the adjustment process. Figure 2 represents Hans Selye's theory of adaptation to a stressor (Selye, 1976):

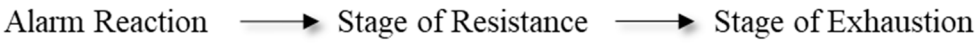

Figure 2. General Adaptation Syndrome.

An alarm reaction occurs when a perceived stressor, alarm stimulus, is introduced to the system. The input stressor presents a “shock” to the system that activates an alarm reaction causing an adjustment phase to occur. The alarm reaction is further divided into the phase of shock and the phase of counter-shock, where the phase of shock is the response to alarming stimulus and the phase of counter-shock is the adjustment process of the system. Selye’s theory represents a physiologic response that may produce pathologic events. As perceived sensory input causes a neuro-endocrine response, specific actions of a system are produced based on the type of stressor experienced or perceived. The perceived input is initiated at different sites (visual, auditory, olfactory, gustatory, touch) and receptor pathways, but the process becomes coordinated when nerve impulses alert the hypothalamus pituitary adrenal (HPA) pathway. The autonomic system activates the hypothalamic center to release corticotrophin-releasing hormone (CRH) that stimulates a response in the anterior pituitary gland to produce adrenocorticotropic hormone (ACTH), triggering the adrenal cortex to release cortisol. The response changes the internal environment causing fluctuations in the response via hormonal, cardiovascular, peripheral vascular, glucocorticoid, catabolic, and mineral-corticoid changes (not inclusive). System adjustment returns the organism to homeostasis. In this stage the body may continue to respond to the original stimulus, as well as any added stimulus creating vulnerability to other stressors. Exhaustion occurs due to continued use of all available adaptive energy. Selye (1950) maintains that the

energy needed to produce adaptation is finite thus pathologies occur during the final stage of exhaustion.

Diseases of Adaptation

As biochemical and neuroendocrine transmission occurs due to an alarm stimulus, alarm reaction and adjustment, the potential for failure to ease tension and restore homeostasis can lead to instability (Steinberg & Ritzmann, 1990). Steinberg & Ritzmann (1990) postulate that this process is damaging to energy expenditure and is partly or totally unsuitable in relieving stress and strain. Stress pathology is the consequence of

Figure 3. Stages of Adjustment (Selye, 1976).

change and/or damage to the biologic structures responsible for the adjustment process, and, according to Steinberg & Ritzmann (1990), there are a number of reasons for stress related pathology. Some of these include whether there is an available adjustment to the specific stressor, whether the appropriate adjustment process is chosen and can be sustained, if the system misperceives the stressor, if there is obstruction at the start or during the preservation of the adjustment process, whether the energy used by the system has been damaged in the process, or whether the ability to support the adjustment process has diminished. According to Selye (1950), “every living organism responds to stress”. The physiologic processes and patterns that produce stress are the same no matter how the stressor is perceived. The resultant alarm reaction leads to specific symptoms of a disease. Symptoms of disease may disappear or reverse, but will inevitably reappear at the stage of exhaustion. The process is cyclical, utilizing energy (ATP/ADP) in the form catabolic (cortisol, epinephrine, glucagon) and anabolic (insulin, anabolic steroids) heat.

Therefore, acute stressors stimulate the HPA axis and the catecholaminergic system causing a catabolic response (Selye, 1950).

The General Adaptation Syndrome theory is best described as a linear model of bio-physiological adaptation to stress, which excludes the perceived sensory experience that initiates the process. In the GAS theory, biologic chemicals associated with pathways in the brain and somatic system prompt the release of hormones and neurochemicals to maintain the homeostatic environment and mediate the alarm response. The stage of resistance is protective of the adaptation process. If the stressor involved is sustained over time, the stage of exhaustion takes over. This stage is indicative of wear and tear on the system leading to pathology. The theory does not include the first cause of physiologic adaptation to stress, which is the perceived stressor. The theory does not elucidate the fact that stress mediators are both protective and destructive depending on time.

Theory of Allostasis

Stress occurs when an exposure or event is perceived. External stimuli taken in by the system through sensory pathways elicit a neurobiological response in the system. The neurobiological response and physiologic reaction to perceived external stimuli sets in motion a cascade of events to occur in response to the sensory perception of the stressor. Therefore, the messenger system involves taking in an experience, neurobiologically messaging and processing the experience to the brain, and communicating the event to the system via a chemical response. According to McEwen (2005), “stress is a condition of the mind-body interaction”.

Allostasis is the process of adaptation. The term, started by Sterling and Eyer (1988), means “stability through change” and incorporates the concepts of the system’s

response to events leading to homeostasis. When an external event prompts a neurological response in the brain, neurotransmitters and chemical mediators influence a reaction to the situation. The brain is the organizer of information input, processing, and system output. Information input is continuous and in constant flux; therefore, allostasis is a fluid process. Problems occur as allostasis increases due to chronic stress. If stress is inefficiently managed, it becomes uncontrollable or causes the system to deteriorate: allostatic load or overload occurs (McEwen, 2005). Allostasis protects the body, however allostatic load creates changes in the system that can lead to allostatic overload, which is a precursor to pathology.

The experiences perceived by the system come from the environment. These experiences are perceived at any moment in the life cycle. These life events are experienced through the senses. The sense response signals areas in the brain to process information and initiate neurochemical activity prompting the system into action. This is allostasis, where system stability is ever changing related to the constant flow of perceived sensory input. Two important concepts are: energy utilized and time.

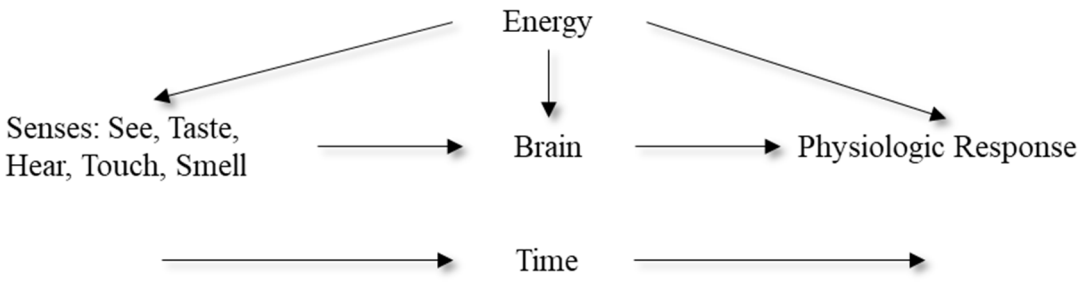

Figure 4. Energy utilized by system over time.

The allostatic model is non-linear relative to the neurotransmitters, hormones and chemical mediators involved in the allostatic response. The following diagram reflects the network of mediators identified in the process. The model displays mediators that change in time, direction and intensity while complementing and compensating for experiences. Allostasis related to a routine occurrence illustrates how the system benefits the self and others based on system response and ability to maintain stability. If the system experiences repeated hits the adjustment cost is termed allostatic load. Allostatic

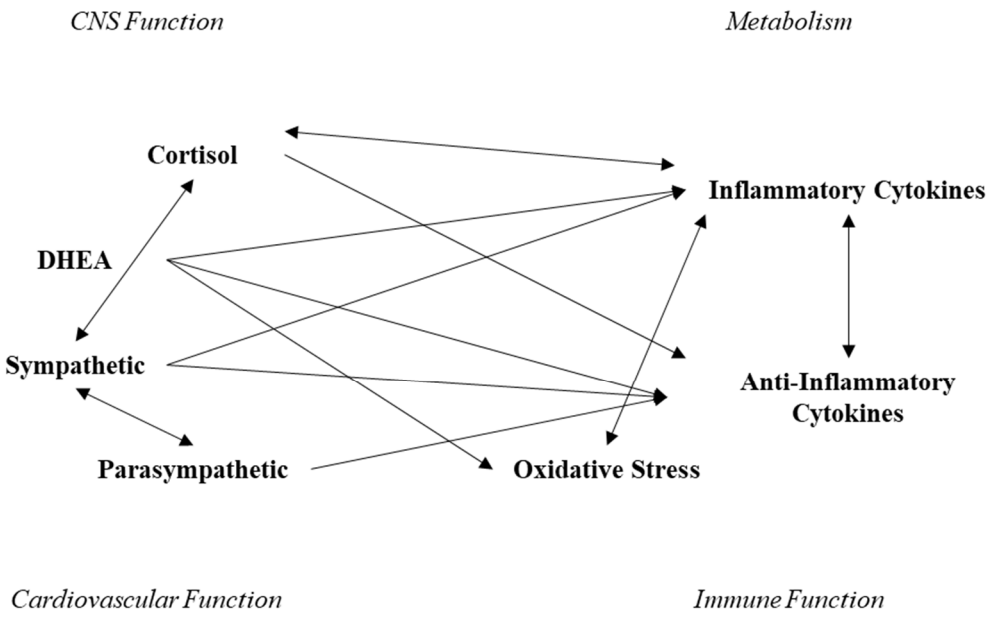

Figure 5: McEwen, B. Protective and Damaging Effects of Stress Mediators: Central Role of the Brain Dialogues in Clinical Neuroscience, 8(4) p. 370.

load is when energy accumulates and is used as a source for survival or the system accumulates energy sources due to abnormal behavioral patterns influenced by traumas, the environment, addictions, and life experiences. As a prolonged allostatic state develops into allostatic load, a change in input or output of fundamental systems and an increase or decrease in neurochemical stress mediators occur. According to McEwen and Wingfield, the change resets the system and a compensatory mechanism creates allostatic overload affecting the "structural modeling" (p. 375) of the brain. Structural remodeling is seen as atrophy, change in neuron structure, or decreased structural volume. Due to the neuroplasticity changes in the brain, chemical and behavioral changes ensue. There are two types of overload: Type I overload defined as "energy demand exceeding supply" (p. 2) (McEwen & Wingfield, 2002), and Type II overload, defined as "sufficient or excess energy consumption accompanied by social conflict and social dysfunction" (p.2) (McEwen & Wingfield, 2002). Social conflict and dysfunction can lead to behavioral

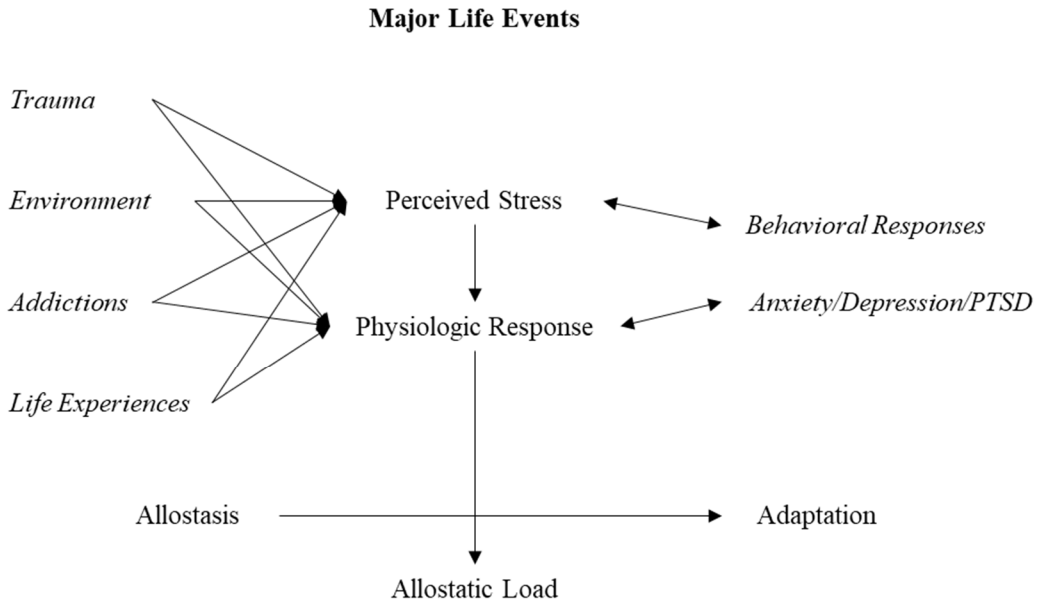

Figure 6: McEwen, B. Protective and Damaging Effects of Stress Mediators: Central Role of the Brain Dialogues in Clinical Neuroscience, 8(4) p. 371.

changes, such as anxiety, aggression, fear, vigilance, depression, etc. (McEwen, 2005)". Allostatic overload leads to system pathology and disease.

Allostatic Overload and Neurochemical Mediators

The hypothalamus pituitary adrenal (HPA) axis controls the endocrine system. The hypothalamus signals the pituitary gland to release messenger hormones into the system to activate glands and organs. When the hypothalamus releases corticotrophin-releasing hormone (CRH) in response to natural physiologic rhythms, it activates the pituitary gland to release adrenocorticotropic hormone (ACTH). ACTH stimulates the adrenal cortex to release corticosteroid hormones (cortisol) (Marieb & Hoehn 2013). These neurobiological hormones produced by the glands and organs respond to stress by altering behavior in the form of "flight-or-fight" or altering the neurochemical response potentially leading to pathological disease.

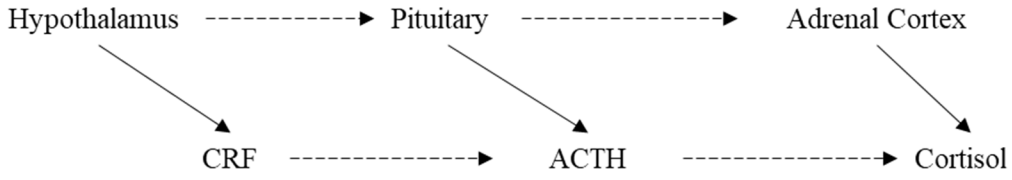

Figure 7: HPA & Hormone response

Stress negatively affects organs due to extended contact with glucocorticoids (cortisol) and catecholamines (Antoni, et al, 2011). These neurohormones and neurotransmitters promote tumor pathogenesis. Antoni and colleagues state behavioral processes concurrent with neurohormonal and neurotransmitter effects advance cancer growth. Behaviors are influenced by the environment and social process. As individuals perceive the environment and react to social influence the HPA system responds. Over time, the variability and system regulations alter physiologic processes having the potential to

promote abnormal cellular growth. Therefore, the neuro-endocrine system's ability to regulate cellular growth leads to tumor development. According to Antoni, et al. (2011) behaviors induce central nervous system processes. Individuals who manage anxiety by adapting to situations will inevitably manifest pathologic symptoms due to the inherent advancement of the neurobiology system. McFarlane (2010) cites; trauma stress disrupts the biochemical process effecting glucocorticoid response, which is related to fear conditioning during the process of allostatic adaptation (p.8). The end result of this is the psychosocial neurobiologic disorder identified as post-traumatic stress disorder.

Substruction

Substruction is the strategy of isolating concepts from an already existing theory and body of research and synthesizing the concepts into a logical diagram that frames the proposed middle range concepts, relational statements, propositions and assumptions. Identification of major variables, concepts, and hypothesized relationships link theories and systems together to create a logical, functioning theory.

The internal and external processing begins at the point of input into the system (stimuli). The proposed theory of adaptation to head and neck cancer concentrates on the internal regulatory system, where biochemical transmissions and neurotransmissions occur due to stimulating events that input from the perceived external environment. Biochemical and neurotransmitters fuel body systems to assist in an effective functional capacity for survival. Adaptation occurs in response to the stimulus and is either effective or ineffective for life processing. Effective adaptation sustains or improves the functional ability of the body system. Ineffective adaptation is indicated by functional decline.

The system is complex and multi-variant. It functions primarily through the autonomic nervous system and includes the perceptual, neural and endocrine pathways. Stimuli occur in one of three ways: 1) stimulus can be external or internal and immediately confront an individual in a particular situation; 2) stimuli from environmental factors, both within and outside of the system, influence the situation; and 3) all unknown or unconscious beliefs or attitudes have the propensity to influence a situation (Roy & Roberts, 1981). This mechanism prepares the individual for coping with external environmental stimuli.

The theory demonstrates that the internal systems respond to external and internal stimuli initiating a chemical and neural response in an intact central and peripheral nervous system. Perceived information from the external environment causes a psychomotor response that travels through the nerve synapse pathway to the brain (CNS). The central nervous system responds with a chemical-endocrine-hormonal response that travels back to the peripheral nervous system affecting glands, organs, and tissues. The body's response to these chemicals is homeostatic where the system adjusts the chemical and hormonal pathways by sensing a deviation from the normal and regulating according to needs. The process utilizes a feedback mechanism and is adaptive to the body's system demands. It is assumed that the internal system will maintain a steady chemical/hormonal state according to the requirements of the organism sensing variations from the normal and regulating according to those demands.

External stimuli initiate chemical and neural input into the CNS causing a response to occur in the brain, multiple organs, glandular tissues, and hormonal systems. These chemical and neural contributors stimulate perceptual and psychomotor responses.

Thus internal stimuli affect the behavioral response seen as anxiety, depression, the occurrence/or not of symptoms of PTSD, as well as, pathological changes and disease progression seen in cancer/tumor development. The experience of post-traumatic stress can be related to military exposures, civilian exposures, or disease exposures. In this document, cancer related symptoms are where cancer patients perceive their diagnosis as life threatening and therefore re-experience trauma through treatments and bio-psychosocial changes.

The autonomic and psychomotor responses that assist in the body's ability to function or adjust to functional status adapts when the physical body is unable to perform due to disease, treatments, or environmental factors that alter the ability to acclimate accordingly. The invasion of cellular changes seen as abnormal cell growth (i.e.: tumor growth) and the treatments to cure, lead to alterations in system functions. Head and neck cancers/tumors affect a multitude of senses and tissues, reworking life preserving bodily functions. It is hypothesized that the neural-chemical-endocrine response system will adapt to the physical situation through a cognitive response identified in the individual seeking treatments and patterns that lead to life sustaining adaptive practices.

The variables identified in the proposed middle range theory of "Adaptation to Head and Neck Cancer" are: 1) post-traumatic stress disorder, 2) head and neck cancer, 3) depression, and 4) adaptation. The model synthesizes the concepts into a diagram that frames the proposed theory for adaptation in the head and neck cancer military population that is experiencing symptoms of post-traumatic stress disorder. The pathway proposes that the external stimuli experienced in stress from head and neck cancer influences an internal stimulus response inducing the production of neurotransmitters

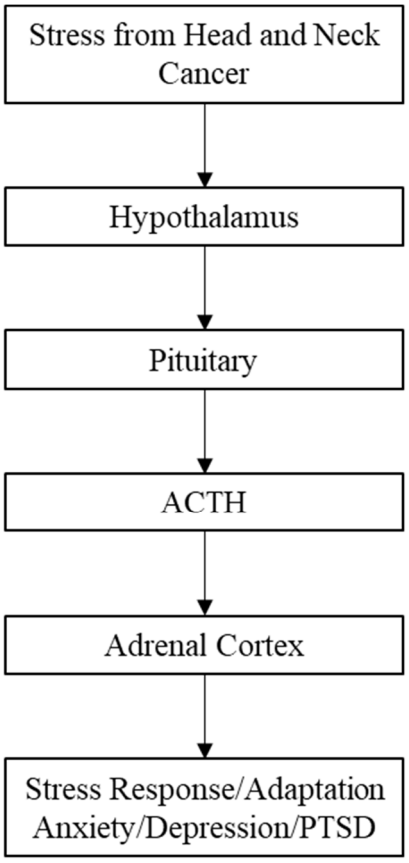

Figure 8: Middle Range Theory of Adaptation to Head and Neck Cancer

affecting organs and tissues. Autonomic and psychomotor reactions are a direct response to the neurotransmission of these chemicals and hormones, which according to Selye's General Adaptation Systems theory, support controlled outcomes. The response changes over time relative to Sterling and Eyer's Allostasis theory. This represents the neurotransmission mechanisms changing the adaptive process of overruling usual feedback systems to meet the expected demands (Sterling, 2003). As neural-chemical changes initiated by perceived environmental events enter the peripheral neurological system and transmit to the central nervous system, processing occurs, causing an autonomic and psychomotor response that leads to adaptation. The action postulates that the chemical response changes or adjusts and resets the homeostatic set point. Adaptation occurs due to the change in constancy: the inability to accommodate needs, and the system maintaining stability through that change. The result is seen in the individual's perception of their quality of life. Figure 9 demonstrations the correlation between concepts:

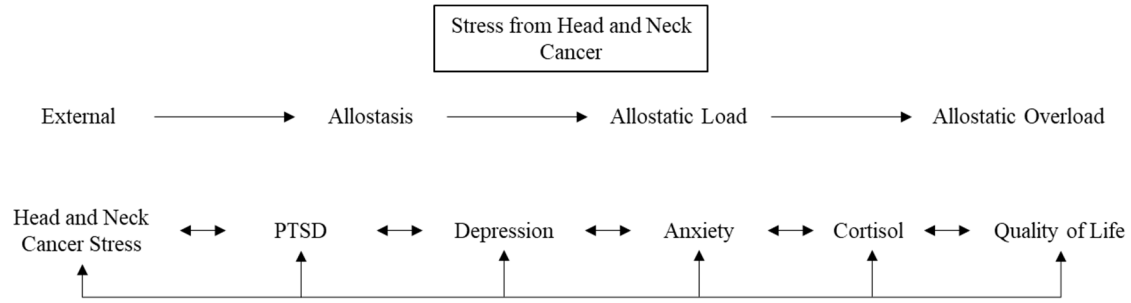

Figure 9: Correlation of Concepts of Middle Range Theory of Adaptation to Head and Neck Cancer

Cancer

Following is the breakdown and further clarification of the concept correlation model considered in the Middle Range Theory of Adaptation to Head and Neck Cancer:

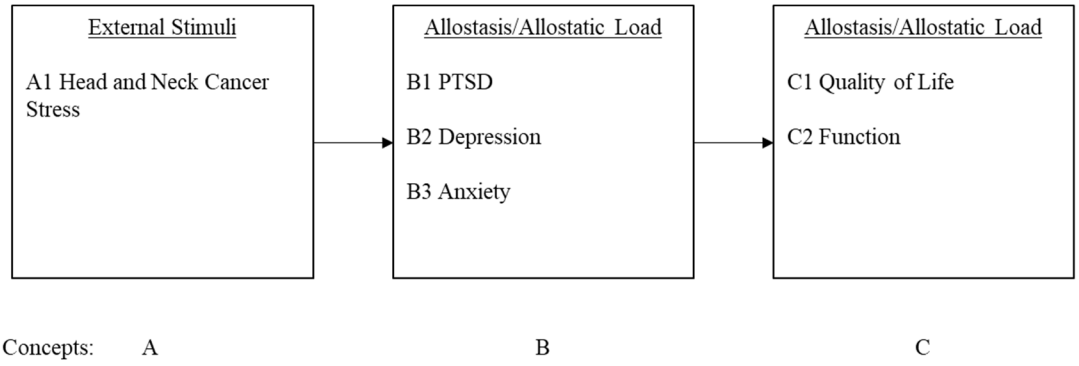

Figure 10: Concept Model of the Middle Range Theory of Adaptation to Head and Neck Cancer

The relatedness between the propositions in the head and neck cancer model follow a pathway where the concepts of perception, environmental stressors, initiation of a chemical process, and head & neck cancer/PTSD/depression trigger a systemic neurotransmission of specific bio-chemicals that lead the system to respond by adapting and is measured in quality of life.

For instance

Concept A + Concept B impacts Concept C

In keeping with propositional relatedness:

A1 is related to B1; and B1 is related to A1

A1 is related to B2; and B2 is related to A1

A1 is related to B3; and B3 is related to A1

A1 is related to C1; and C1 is related to A1

A1 is related to C2; and C2 is related to A1

B1 is related to B2; and B2 is related to B1

B1 is related to B3; and B3 is related to B1

B2 is related to B3; and B3 is related to B2

B1 is related to C1; and C1 is related to B1

B1 is related to C2; and C2 is related to B1

B2 is related to C1; and C1 is related to B2

B2 is related to C2; and C2 is related to B2

B3 is related to C1; and C1 is related to B3

B3 is related to C2; and C2 is related to B3

C1 is related to C2; and C2 is related to C1

Operational Level for Substruction

In order to test the specific variables in the model, substruction is further delineated to quantitative measurements using specific instruments that numerically evaluate the variables presented in this study. Further discussion regarding instrument measurements relative to variables are expounded on in chapter 3. Figure 11 identifies quantitative instruments used to measure the defined variables:

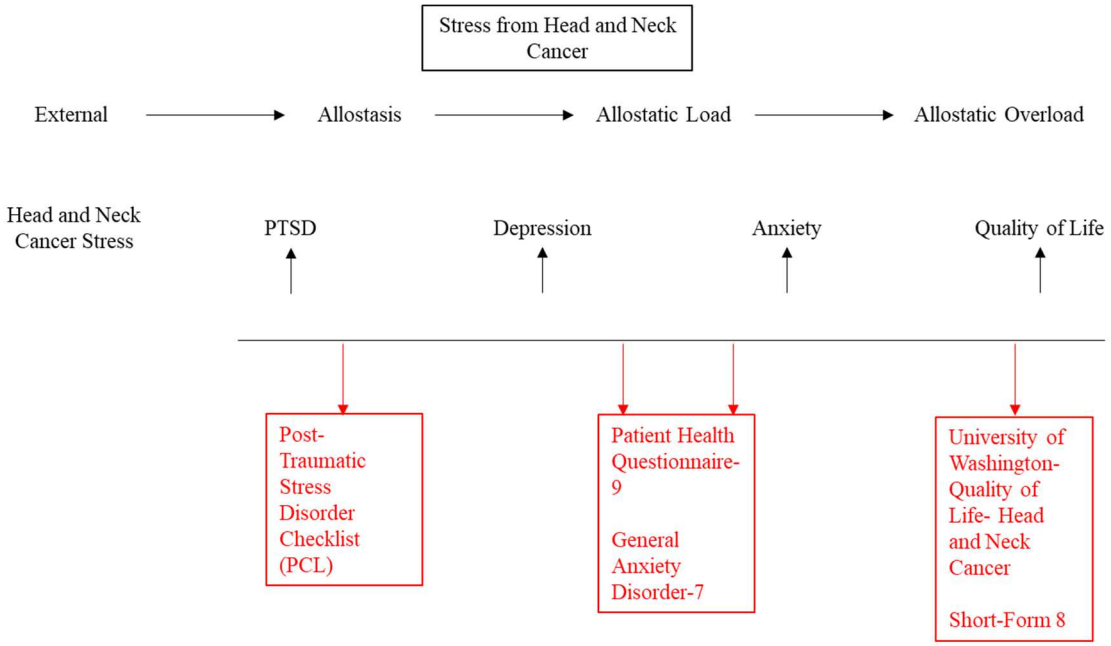

Figure 11: Correlation of concepts of middle range theory of adaptation to head and neck cancer. Correlation Relation Model of Theory of Adaptation to Head and Neck Cancer (Quantitative Measurements)

The GAS theory involves energy (Krebs cycle, ATP, and ADP). The allostasis theory involves energy and time. Therefore, the proposed research study of interest is a prospective, longitudinal, repeated measures study designed to assess head and neck cancer diagnosis and treatments, depression, and PTSD on adaptation and quality of life in a veteran population.

Observation demonstrates the subject military population to be transient related to homelessness (Metraux, 2018; Henwood, Wenzel, Mangano, Hombs, Padgett, 2015) and therefore difficult to follow long term. Also, the population is reserved and restrained with their "stories" (Cannon, 2018; VA HSR&D Queri 2015 National Conference). Therefore, a pilot study was done to establish feasibility, participant receptivity and availability. The study was a descriptive, cross-sectional, non-experimental analysis in a convenience sample of the occurrence of post-traumatic stress disorder (PTSD) related to the military experience, PTSD related to civilian life (pre and post military experience),

and PTSD related to disease processes. PTSD may be associated with anxiety and depression, and therefore influence quality of life. The study examines PTSD correlated with anxiety, depression, and quality of life in the head and neck cancer veteran.

Chapter 3

Methodology

Research Design

This pilot study was a descriptive, cross-sectional, non-experimental analysis of the occurrence of post-traumatic stress disorder (PTSD) related to the military experience, PTSD related to civilian life (pre and post military experience), and PTSD related to the disease process. PTSD may be associated with anxiety and depression, and therefore influence quality of life. The study examined PTSD correlated with anxiety, depression, and quality of life in the head and neck cancer veteran. PTSD, quality of life, and adaptation were analyzed at initial cancer diagnosis; data was collected at the initial point, with attempts to follow twice more, depending on subject availability. This follows the concepts presented in the allostatic theory of changes occurring over time.

The pilot study was performed as a smaller scale of the larger version of the protocol as written and approved. Assessment of study feasibility was measured based on willingness of clinicians to recruit participants, PI ability to contact and invite into study, the number of eligible participants was limited due to single center study and the time to study completion being limited to one year. Retention was measured on return of participants' phone calls and responses to surveys at weeks 7-8 and weeks 12-14.

Sample and Setting

Participants were recruited from the Veterans Health Administration Oncology, Radiology, Ear Nose and Throat, and ambulatory care units at the John Dingell Veterans Administration Hospital Detroit, Michigan. Data were collected from August 2017 to March 2018. Inclusion criteria for the study were: 1) any war or military years of service and 2) new diagnosis of cancer of the head or neck. Excluded from the study were those diagnosed with: 1) a brain cancer, 2) bipolar disorder, and/or 3) schizophrenia.

Approval was obtained from the Institutional Review Boards (IRB) at Wayne State University and John Dingell Veterans Affairs Hospital. An identifying number linking test results and surveys was issued to each participant for information coding for human subjects protection. The subject identification was limited to the issued number only – no patient identifiers were kept. Packets were stored on site at the JDDVAMC in a locked computer, locked desk, locked room. The PI was the only individual with access to subject information. Participants were acquired through co-primary investigator head and neck oncology surgeon who identified participants. Participants were contacted through phone or on-site visit and invited into the study. If participant was agreeable, consent was obtained. Participants were not compensated for their participation. Participants had the opportunity to drop out of the study at any time.

Protocol

Once consent was obtained, participants were asked to complete surveys and tests at the medical center, in residence, or via telephone. Meeting times were arranged at initial visit through verbal consent for contact at week 7-8 according to subject's initial date and at week 12-14 from initial contact. Participants chose meeting sites. In order to maintain privacy at agreed upon meetings sites, available single/private rooms or

personal home locations were used. Contact information was verified at each visit and included home phone number, cell phone number, alternate contact phone number, home address, and e-mail address. Addresses were utilized in the event that phone numbers were not accurate, unable to take messages, or disconnected. The Primary Investigator (PI) read each survey to the participant in order to capture 100% accuracy and completion, improving statistical analysis and scores. Participants were contacted over three points in time: 1) at time of diagnosis, 2) at 7-8 weeks, and 3) at 12-14 weeks after diagnosis.

The following surveys were issued at each of the three points in time: 1) Post-Traumatic Stress Disorder Checklist Survey (PTSD-PCL), 2) Patient Health Questionnaire-9 (PHQ-9), 3) Short Form-8 (SF-8), 4) University of Washington-Quality Of Life Head & Neck Cancer (UW-QOL-H&NCa) 5) General Anxiety Disorder-7 (GAD-7). Structured interviews of questionnaires were initiated where PI read all survey questions to subjects in order to gather accurate and complete data.

Measures

Demographic Data Form

The researcher developed a tool designed to facilitate extraction of specific information from the charts of consented subjects. Chart review and participant interview included the following demographic data: age, military branch, time of inclusion in military service, military placement, combat exposure, and total years of military service. Time of inclusion in combat areas and length of deployment defined specific exposures, military placements defined soldier deployment locations, combat experiences; years of service identified number of exposures and delineated specific military campaigns based

on service branch. The tool also collected information on education, employment, and marital status. Included were items related to comorbid disease processes and life style experiences.

Cancer Information

The PI gathered information on cancer site, ICD-10 code, cancer staging, cancer grade, and treatment options from the veteran and medical records. Treatment protocols specific to head and neck cancer locality, stage, and grade were gathered for longitudinal statistical analyses and correlation to demographic data.

Post-Traumatic Stress Disorder-Post Traumatic Stress Checklist (PTSD-PCL)

Confirmation of PTSD symptoms required assessment of traumatic and stressful military, civilian, and non-military specific traumatic experiences; therefore, the Post Traumatic Stress Disorder-Checklist (PCL) screen was completed by each veteran to test for repeated memories or thoughts, repeated or disturbing dreams, relived experiences, avoidance, and memories of the past. The tool links symptoms to events and is derived from the DSM-V (PCL) to reference specific event types (assault, disaster, or accident). The PTSD-PCL is checklist specific and is administered in sets of three. Each questionnaire asks the same questions with a different focus. The three different foci are: military experience, civilian experience, and illness experience. Using a Likert scale from 1 (not at all) to 5 (extremely), the PTSD-PCL rates 17 PTSD symptoms from the previous month indicating the degree of how much the participant had been bothered by a symptom. The PCL tool is self-administered to assess: trauma and trauma related military experiences; symptoms related to general “stressful experiences” and symptoms related to any specific “stressful experience”. According to Forbes, Creamer, & Biddle (2001),

the checklist should indicate changes in diagnostic status which would require additional assessment of the changes in severity of symptoms. The PCL would also validate a high level of sensitivity at time of intake and analytic accuracy at follow-up (Forbes, et al., 2001; Keen, Kutter, Niles, & Krinsley, 2008). The tool was rated excellent for test-retest reliability over a 2-3 day period (Weathers, Bovin, Lee, Sloan, Schnurr, Kaloupek, . . . Marx, 2018). The tool created a total symptom severity score. The range of scores total 17 – 85 on a 5-point likert scale (1 = "not at all" to 5 = "extremely") of 17 items. Scores of 17 – 20 = few or no symptoms of PTSD; scores of 21-29 = minimal symptoms of PTSD; scores of 30 -85 = are consistent with multiple symptoms of PTSD. Cut-off scores depend on medical settings: a suggested cut-off score of 30-35 is positive for PTSD in the general population/civilian; a suggested cut-off score of 36-44 is positive for PTSD in the VA primary care/specialized medical clinics (traumatic brain injury or pain); and a suggested cut-off score of 45-50 is positive for PTSD in the VA or civilian specialty mental health clinics (National Center for PTSD, 2014).

Generalized Anxiety Disorder 7-Item Scale (GAD-7)

The General Anxiety Disorder-7-item scale assessed anxiety, a common mental disorder seen in general medical practice and within the general population. The seven items on the GAD were scored from mild to moderate to severe and focused on "severity of symptoms" and "worsening functional status". The GAD is a self-reporting questionnaire consisting of 7-items regarding nervousness, worry, trouble relaxing, restlessness, annoyance, or fear of something happening. The items used a 4 point likert scale: 0=not at all, 1= several days, 2= more than half the day, and 3= nearly every day. Scores of 10 or greater identified cases of generalized anxiety with measurement points

of 5, 10, 15 interpreted as mild, moderate and severe anxiety (Spitzer, et al, 2006). Spitzer and colleagues (2006) cited the prevalence of general anxiety disorder in the general population as 1.6% to 5.0%. In the general population, the GAD-7 was reliable and valid with a sensitivity of 89% and specificity of 82%, internal consistency was "excellent" (Cronbach $\boldsymbol{\alpha}$ = 0.92), and test-retest reliability good (interclass correlation = 0.83) (Spitzer, et al, 2006). According to Veterans Affairs research, (Spoont, Arbisi, Fu, Greer, Kehle-Forbes, & Meis, 2013) the GAD-7 was reliable and valid with a sensitivity of 76%, specificity of 75%, a positive predictive value of 22% and a negative predictive value of 97%.

Patient Health Questionnaire-9 (PHQ-9)

The Patient Health Questionnaire-9 questionnaire was used to assess depression within and between groups. The PHQ-9 is a measurement tool of choice in the VA system used to measure symptoms of depression and can provide a provisional diagnosis with treatment recommendations. The PHQ-9 can be self –administered in a clinical and research setting and can provide information for depressive symptoms and depressive symptom severity (Kroenke & Spitzer, 2002). According to Kroenke & Spitzer (2002) the PHQ-9 is sensitive to change during treatments and over time making the tool valuable for clinicians and researchers. The PHQ-9 depression scale consists of nine items. The nine items are related to symptoms that occur over the past two weeks and are related to interest of pleasure in doing things, feeling down/depressed/hopeless, trouble with sleeping, feeling tired or having little energy, poor appetite, feeling bad about self, moving or speaking slowly, and thoughts of self-harm or suicide. Each of the eight items is scored from 0 (not at all), 1 (several days), 2 (more than half the days) and 3 (nearly

every day); providing severity scores from 0 - 27. An additional question asked about difficulty in work, relationships of taking care of things in the home with a four item response scale of: not difficult at all, somewhat difficult, very difficult, and extremely difficult. Depression severity was scored 0 - 4 = none or minimal depression; 5 - 9 = mild, watchful, waiting, and repeat at follow up; 10 - 14 = moderate, treatment plan initiated, consider counseling, follow up and/or pharmacotherapy; 15 - 19 = moderately severe, active treatment with pharmacotherapy and/or psychotherapy; and 20 – 27 = severe needing immediate initiation of pharmacotherapy and expedited referral to mental health. Kroenke & Spitzer (2002) offered that a PHQ-9 score of 10 or greater has a sensitivity of 88% and specificity of 88% for major depression with a probability ratio of 7.1. Kroenke, Wu, Yu, Bair, Kean, Stump, & Monahan (2017) reported high internal reliability Cronbach's alpha 0.8 – 0.9 in three Veteran Administration trials – and according to the Veterans Affairs Department of Defense (2010) depression screening and assessment the PHQ-9 is a reliable measure for detection of depression and identifying the level of severity of depression in the veteran population.

Short Form-8 (SF-8)

The Short Form – 8 question survey (SF-8) focuses on eight health concepts and a single question on perceived change in general health. The SF-8 has taken one question from each of the 8 domains of the SF-36 scale. The eight health domains are: 1) general health, 2) physical functioning, 3) physical roles, 4) bodily pain, 5) vitality, 6) social functioning, 7) mental health, and 8) emotional roles. The items have a 5 – 6 point response. The SF-8 four-week recall briefly measured overall physical and mental function with a reliable completion score due to survey briefness, where the estimated

time to completion is one to two minutes (Roberts, Browne, Ocaka, Oyok & Sondorp, 2008). Roberts, et al. (2008), showed that the SF-8 had a "good intraclass correlation of 0.61 for physical health status and 0.68 for mental health status.

University of Washington-Quality of Life Head and Neck Cancer Survey (UW-QOL H&N CA)

The UW-QOL H&N CA survey is a measurement of condition-specific quality of life based on adaptation to H&N cancer in regards to function and psychological state to the head and neck cancer population. There are four versions of the UW-QOL scale. The UW-QOL, version 1 was first published in 1993 and covered nine domains (pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, employment). The UW-QOL Version 1 had established an average standard validity score of 0.849 and a reliability score > 0.90 when compared to other quality of life scales (Karnofsky validity 0.826 and reliability 0.80 and Sickness Impact Profile validity 0.87) (Rogers & Lowe, 2010). The 9-domains included in Version 1 directly regarded head and neck measurements. The questionnaire was simple to complete and score, which was important to researchers, oncologists, and surgeons offering face and construct validity. Version 2 (1997) added the "importance rating scale", three quality of life questions and a free text portion regarding patient specific "issues of importance", which helped identify patients with problems who may benefit from interventions (Rogers & Lowe, 2010). In Version 2 the free text section was addressed by 61% of respondents (39% head and neck; 35% medical) (Rogers & Lowe, 2010). Version 3 (Weymuller et al., 2000-2001) added two new domains (taste, saliva) and dropped one (employment). Version 3 requested participants to specify three most important domains over the last seven days.

The UW-QOL-R became a 10-item survey and had an "overall internal consistency score of 0.85" (Rogers & Lowe, 2010). Version 4 added an emotional component and included the two domains of anxiety and mood, which correlated significantly with "global quality of life". The survey was simple and quick for screening the QOL in head and neck cancer in the clinical and research setting and was sensitive to changes over time (Rogers & Lowe, pg. 102, 2010). The UW-QOL Scale assesses 12 domain-specific and frequently used questions in the head and neck cancer population. The survey was self-administered and easy to complete, in an effort to avoid input from health care providers and thereby improve accuracy in QOL of patients by gaining their perspective (Rogers & Lowe, 2010). Due to ease of use, missing data was rare (Rogers & Lowe, 2010). The tool addresses: pain, appearance, activity level, recreation, swallowing, chewing, speech, shoulder function, taste, saliva production, depression, and anxiety. According to Rogers & Lowe the survey questions are precise and measure what should be measured and what should not be measured, while covering a range of details through discussion between participant and PI as to what is intended to be included giving it face and content validity.

The 12-domain specific items are scored from 0 (worst QOL) to 100 (best QOL). The tool used an ordinal scale for pain, appearance, activity, recreation, chewing, and mood. Scoring had five possible responses (0, 25, 50, 75, 100), where the lowest scores represented the most severe outcomes and the highest score represented the best outcomes. The tool used an ordinal scale for swallowing, speech, shoulder, taste, saliva, and anxiety with four possible responses (0, 30, 70, 100), where the lowest scores represented the most severe and the highest scores represented the best outcomes. The three global results of "health-related quality of life compared to month before had

cancer", "health related quality of life during the past 7 days, and "overall quality of life during the past seven days" used an ordinal scale (0, 20, 25, 40, 50, 60, 75, 80, 100), where scores for global results of "health-related quality of life compared to month before had cancer" rated (0) much worse, (25) somewhat worse, (50) about the same, (75) somewhat better, and (100) much better; global results for "Health related quality of life during the past 7 days" and "overall quality of life during the past seven days" rated (0) very poor, (20) poor (40) fair (60) good (80) very good and (100) outstanding.

In order to simplify variable computation and result reporting, the scale was transformed into the following terms: none (0) represented best outcomes, mild (25) represented better, moderate (50) represented good, severe (75) represented poor, very severe (100) represented poorest outcomes; therefore, the scale results were reversed where 0 represented best outcome and 100 represented poorest outcome. There were two divisions in the survey scores, one division for "physical function" (chewing, swallowing, speech, taste, saliva and appearance) and one division for "social-emotional function" (anxiety, mood, pain, activity, recreation and shoulder function). Both divisions utilized the same transformed variable computations and results.

Rogers & Lowe (2010), note the UW-QOL tool is a well-defined functional questionnaire that is useful, realistic, accepted by the study population and easily translated. The questionnaire measures what it is supposed to measure, domain results are important to the patient and medical teams, and adequately covers what is meant to be included (breadth and depth) giving the UW-QOL 'good' face and content validity. The ease of use of the UW-QOL tool facilitates evaluation of treatments, change in patient conditions, and change in clinical group conditions.

Data Analysis

Data were analyzed using SPSS 24.0 software package (SPSS INC, Chicago, IL). Measurements of central tendency on respondent characteristics mean, mode, median, range, and standard deviation was calculated on the following demographic data: age, race, education, employment, marital status, comorbid diseases, life style, military branch, military service time, military placement, combat exposure, and total years of service. Concomitantly, the mean, mode and median were calculated on cancer information: site, cancer staging, grade, and cancer treatments. Correlation between symptoms of depression was calculated as well. Associations between scores and categorical data or continuous variable t-test, correlations, and frequency analysis were evaluated. T-test for malignant cancer versus non-malignant cancers was analyzed. PTSD scores, relationship between anxiety and depression, and a frequency table on quality of life scores were analyzed.

CHAPTER 4

RESULTS

Participant Characteristic

Enrollment

Thirty participant names were provided to PI for interview and inclusion into study. The ages ranged between 20 – 89 years. A review of the level of education, marital status, employment, comorbidities, and lifestyle activities were recorded on each participant. The participants may or may not have had symptoms of post-traumatic stress disorder and/or depression. The sample of possible participants included 29 males and one female. Eleven agreed to participate in the study, seventeen declined, one participant

was excluded due to ‘non-military status’ and one participant was excluded due to ‘listed as a spouse’. Of the eleven participants, two expired. One gave verbal consent with date set to meet for written consent and prior to meeting for written consent and initial data collection the participant expired; and one participant expired after completed consenting and initial testing.

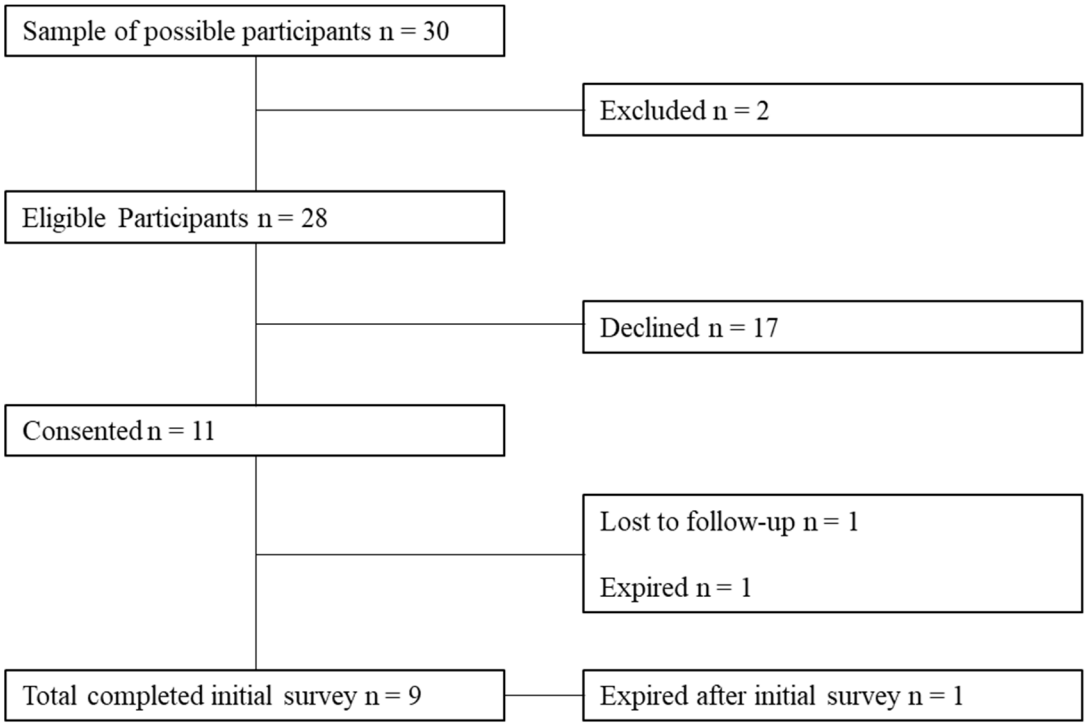

Figure 12: Enrollment

Participants were all middle aged and older adults. The research was focused on the military population with approximately 85.1% male to 14.9% female ratio (Demographics Report, 2013); therefore, the participants were all male. Majority of participants were Caucasian, college educated and employed part-time. Only three service branches were represented. Military service years were listed between1963 -

1989. Diagnosis dates of the nine subjects occurred from September 2017 – February 2018. The characteristics are detailed in Table 1.

Table 1. Sample Characteristics of Participants

Variables	**Mean**	**St. Deviation**
Age in years (18 – 44)	**28.04**	**7.0**
Variables	**Frequency**	**Percent**
Gender		
Male	9	100
Female	0	0.0
Employment		
Full-Time	2	22.2
Part-time	5	55.6
Unemployed	0	0.0
Retired	2	22.2
Race		
African American	2	22.2
White	7	77.8
Military Service		
Air Force	2	22.2
Army	5	55.6
Navy	2	22.2
Education		
College	7	77.8
Unknown	2	22.2

There were seven different diagnoses. A neoplasm is an abnormal growth of cells that impinges or damages surrounding tissues. A neoplasm can be benign or malignant,

requiring surgical removal and tissue analysis to identify malignant or non-malignant status. Diagnosis types are detailed in table 2.

Table 2: Frequency and Percent Diagnosis

Diagnosis	Frequency	Percent
Basal Cell Carcinoma	3	33.3
Esophageal & adenocarcinoma HER2+ *	1	11.1
Malignant melanoma *	1	11.1
Malignant neoplasm base of tongue *	1	11.1
Malignant neoplasm tongue *	1	11.1
Malignant Supraglottis neoplasm *	1	11.1
Squamous Cell Carcinoma	1	11.1

*Denotes malignant cancers

Aims and Research Questions.

Aim 1.

The first aim of the study was to identify the occurrence of symptoms of PTSD at time of cancer diagnosis and during exposure to treatments for head and neck cancer as evidenced by positive PTSD-PCL test scores. Research question 1: Does the diagnosis of head and neck cancer impact the onset of PTSD symptoms as measured by the PTSD-PCL measurement tool?

In order to confirm PTSD symptoms related to traumatic and stressful military, civilian, and non-military specific experiences the PI used the Post Traumatic Stress Disorder Checklist (PTSD-PCL) (Weathers, et al, 1993). The complete PTSD-PCL

questionnaire includes 3 questionnaires (PTSD-PCL-M, PTSD-PCL-C, & PTSD-PCL-S) with 17 items each and differentiated by the specificity of identified traumatic events during interviews. The 17 items on the three questionnaires are the same. The interviewer sets the focus during the interview process. The PTSD-M form and questionnaire refers to any "stressful military experience", the PTSD- C form and questionnaire pertains to "a stressful experience from the past" and in this study became any stressful civilian life incident, and the PTSD-S form and questionnaire references any "specific traumatic event or stressful experience" and in this study refers to subject's sickness. A likert scale from 1 (not at all) to 5 (extremely) is used. The total scores ranged from 17 – 85 on each of the questionnaires. Suggested cut-point scores of 45-50 is the general recommendation for PTSD in the combat military population versus a total score of 30-35 as the general recommendation cutoff in the civilian population (VA National Center for PTSD, 2012). The score is a predictor of PTSD diagnosis based on the Structural Clinical Interview for DMS-IV PTSD module. The PTSD-PCL screen was completed by each subject, the screen tests for repeated memories or thoughts, repeated or disturbing dreams, reliving experiences, avoidance and memories of the past.

Nine subjects completed the PTSD-PCL survey tool. Subjects were asked prior to each of the three tools to focus on their civilian life experiences, their present sickness experiences, and their military experiences. Twenty-seven surveys were reported. Scores ranged from 17 to 85. In the military population, the cut-off score for "positive for post-traumatic stress disorder" on the PTSD-PCL was 50. Of the 27 completed surveys, five scored 50 or higher. Two surveys (22.2%) scored positive with scores > 69 on the PTSD-PCL-Civilian version. Two surveys (22.2%) scored positive with sores >60 on the PTSD-

PCL-Sickness version. One survey (1%) scored positive with a score of 69 on the PTSD-PCL-Military version. Two (22.2%) of the nine subjects had positive PTSD scores. One subject was positive for PTSD-PCL-C and PTSD-PCL-S; and one subject was positive for all three surveys: PTSD-PCL-C, PTSD-PCL-S, and PTSD-PCL-M.

A Pearson correlation analysis between PTSD-C, PTSD-S, and PTSD-M was employed. There was a significant correlation between PTSD-C and PTSD-S ($r = 0.91$, $p = 0.001$); a non-significant correlation between PTSD-M and PTSD-C; and a non-significant correlation between PTSD-M and PTSD-S. Although most of the correlation coefficients between the PTSD subscale scores were not statistically significant, they were in the moderate range and presented in Table 3.

Table 3. Correlation Coefficients between the PTSD Scores

	DXTYPE	Civilian PTSD Score	Sickness PTSD Score	Military PTSD Score
DXTYPE	1			
Civilian PTSD Score	0.48	1		
Sickness PTSD Score	0.36	0.91**	1	
Military PTSD Score	0.15	0.49	0.41	1

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

Data were divided into two groups: non-malignant and malignant. The two-sample t-test was used to determine the difference in average PTSD scores between the two groups. As indicated in Table 4, the difference in average PTSD scores between the two groups of non-malignant and malignant patients was statistically non-significant.

However, the average PTSD scores in civilian, sickness, and military were higher in malignant cancer patients.

Table 4. Difference in Mean PTSD Scores between Non-Malignant and Malignant Groups.

PTSD	Non-Malignant		Malignant		t value	p value
	N	Mean(SD)	N	Mean(SD)		
Civilian PTSD Score	4	24.0(9.4)	5	43.4(25.5)	1.57	0.173
Sickness PTSD Score	4	27.0(7.1)	5	41.0(26.2)	1.14	0.307
Military PTSD Score	4	26.3(6.7)	5	31.0(21.9)	0.41	0.691

Aim 2.

The second aim of the study was to examine the occurrence of anxiety and depression at diagnosis and throughout the treatment courses for head and neck cancers.

Research question 2: what is the frequency of self-reported anxiety and depression as measured by the GAD-7, and the PHQ-9 in the head and neck cancer patient at time of diagnosis?

As shown in Table 5, the most patients indicated “Not at all” when responding to each category of anxiety disorder and much fewer responses reported were “Nearly Every Day” category.

Table 5. Percent of the Responses for the Different Categories in GAD (Anxiety Disorder)

Anxiety Disorder Categories	Not at all (%)	Several Days (%)	More Than Half the Days (%)	Nearly Every Day (%)

Feeling nervous or on edge	55.6	22.2	22.2	0
Not being able to stop or control worrying	66.7	11.1	11.1	11.1
Worrying too much about different things	44.5	33.3	11.1	11.1
Trouble relaxing	55.6	33.3	0	11.1
Being so restless that it is hard to sit still	66.7	11.1	11.1	11.1
Becoming easily annoyed or irritable	44.5	44.4	11.1	0
Feeling afraid as if something awful might happen	55.6	22.2	22.2	0

As indicated in Table 6, the majority of responses in PHQ categories, except for "Feeling tired or having little energy", were addressed to "Not at all." The last question in PHQ, not listed in Table 6, asked patients: "How difficult have those problems made it for you." The answer to the last question was either "Not difficult at all" or "Extremely difficult." The results are indicated in Table 6.

Table 6. Percent of the Responses for the Different Categories in PHQ (Depression)

PHQ Categories	Not at all (%)	Several Days (%)	More Than Half the Days (%)	Nearly Every Day (%)
Little interest or pleasure	55.6	11.1	11.1	22.2
Feeling down, depressed	55.6	22.2	11.1	11.1
Trouble falling asleep	55.6	11.1	22.2	11.1
Feeling tired or having little energy	22.2	22.2	44.4	11.1
Poor appetite	55.6	11.1	11.1	22.2
Feeling bad about yourself	66.7	0	33.3	0
Trouble concentration	55.6	33.3	11.1	0
Moving or speaking so slowly	66.7	0	33.3	0

Thoughts that you would be better off dead	77.8	22.2	0	0

The Pearson correlation analysis was applied to address the question: "What was the correlation between anxiety and depression as measured in the head and neck cancer patient at time of diagnosis. A significant correlation coefficient between anxiety and depression was found ($r = 0.94$, $p < 0.0001$).

Aim 3.

Aim 3 was to examine quality of life in the head and neck cancer patient with/without PTSD symptoms and undergoing treatments. Research Question 3 is: What symptoms are most frequently declared in head and neck cancer patients measured by the UW-QOL-HNC questionnaire? And Research Question # 4: What was the correlation between the identified symptoms of the head and neck cancer patients with PTSD scores at initial diagnosis?

Physical and Social-Emotional functions are shown in Table 7. The higher percent of the responses to physical functions belonged to the "None" category. However, the percent responses to social-emotional functions were mixed as exhibited in Table 7.

Table 7. Percent of Responses to Physical and Social-Emotional Functions

Functions	None %	Mild %	Moderate %	Severe %	Very Severe %
Physical					
Chewing	55.6	0	22.2	0	22.2
Swallowing	44.4	22.2	0	11.1	22.2
Speech	44.4	44.4	0	0.0	11.1
Taste	33.3	22.2	0	22.2	22.2

Saliva	44.4	33.3	0	11.1	11.1
Appearance	44.4	22.2	0	22.2	11.1
Social-Emotional					
Anxiety	33.3	11.1	11.1	33.3	11.1
Mood	22.2	11.1	44.4	22.2	0.0
Pain	22.2	33.3	11.1	22.2	11.1
Activity	11.1	0.0	33.3	33.3	22.2
Recreation	11.1	11.1	22.2	55.6	0.0
Shoulder	44.4	22.2	0.0	22.2	11.1

Quality of Life is shown in Table 8 and Table 9. When asked to "Rate health related quality of life compared to month before cancer", a higher percent reported "moderate" as seen in Table 8.

Table 8. Percent of Responses Related to Quality of Life

Quality of Life	**None %**	**Mild %**	**Moderate %**	**Severe %**	**Very Severe %**
Health related quality of life compared to month before cancer	11.1	11.1	55.5	11.1	11.1

As indicated in Table 9, a higher percent of the patients reported "good" for "health related quality of life past seven days". On the other hand, a higher percent reported "poor" when they responded to "rate overall health related quality of life".

Table 9. Percent of Responses to Health Related Quality of Life Questions

Quality of Life	**Outstanding %**	**Very Good %**	**Good %**	**Poor %**	**Very Poor %**

Rate health related quality of life past 7 days	22.2	11.1	44.4	22.2	0.0
Rate overall health related quality of life	22.2	22.2	11.1	44.4	0.0

Aim 4.

Aim 4 examines the correlation between anxiety, quality of life, and PTSD throughout treatments for head and neck cancer. Research Question 5: What is the correlation between PTSD and physical and social-emotional functions? Since the physical and social-emotional functions variables were measured on an ordinal scale, the Spearman correlation analysis was used to address this question. As shown in Table 9, although most of the calculated correlation coefficients were in small to moderate range, none of them were statistically significant at a 0.05 level. However, there were two high level correlations between sickness PTSD and saliva (r = 0.52) and between sickness PTSD and shoulder (r = 0.52).

Table 10. Spearman Correlation Coefficients between PTSD and Physical and Social-Emotional Functions

	Civilian PTSD	Sickness PTSD	Military PTSD
Physical			
Chewing	-0.26	0.09	0.36
Swallowing	0.03	0.4	0.32
Speech	0.4	0.07	-0.14
Taste	0.09	0.45	0.28
Saliva	0.22	0.52	0.39
Appearance	-0.36	-0.01	-0.04
Social-Emotional			
Anxiety	-0.17	0.14	0.01

Mood	0.41	0.44	0.41
Pain	0.34	0.29	0.14
Activity	0.17	0.14	0.01
Recreation	0.13	0.07	0.3
Shoulder	0.05	0.52	0.16

*. Correlation is significant at the 0.05 level (2-tailed).

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

Aim 5.

Aim 5 examined the feasibility and acceptability of a main research study on PTSD and head and neck cancer in the military population, and whether the population was amenable. The study was approved for a single clinical setting; therefore, the number of participants able to take part was limited in size. The study time was from August 2017 to March 2018 with the first participant enrolled the first week of September 2017. Clinical setting provided thirty participants. Nine participants (30%) agreed to study inclusion. The initial survey time took 45 minutes to one hour. One hundred percent of the participants completed the initial survey protocol. The second and third arm of the study protocol took approximately thirty minutes.

Study acceptability and retention was measured in ability to contact participants for week 7-8 and week 12-14 of study protocol. Participants were contacted by phone or mail out packets. Forty-four percent was contacted for the second portion of the study. Twenty-two percent were contacted at weeks 12-14 for the third portion of study. Twenty-two percent completed the second and third portion of the study. Twenty-two percent completed study protocol weeks 7-8, but did not complete study protocol week 12-14. One percent of the population messaged the PI stating that they could no longer be

in the study. And forty-four percent did not respond to phone calls or mail out packets. The second and third portions of the study were completed within 25-30 minutes. (Figure 13)

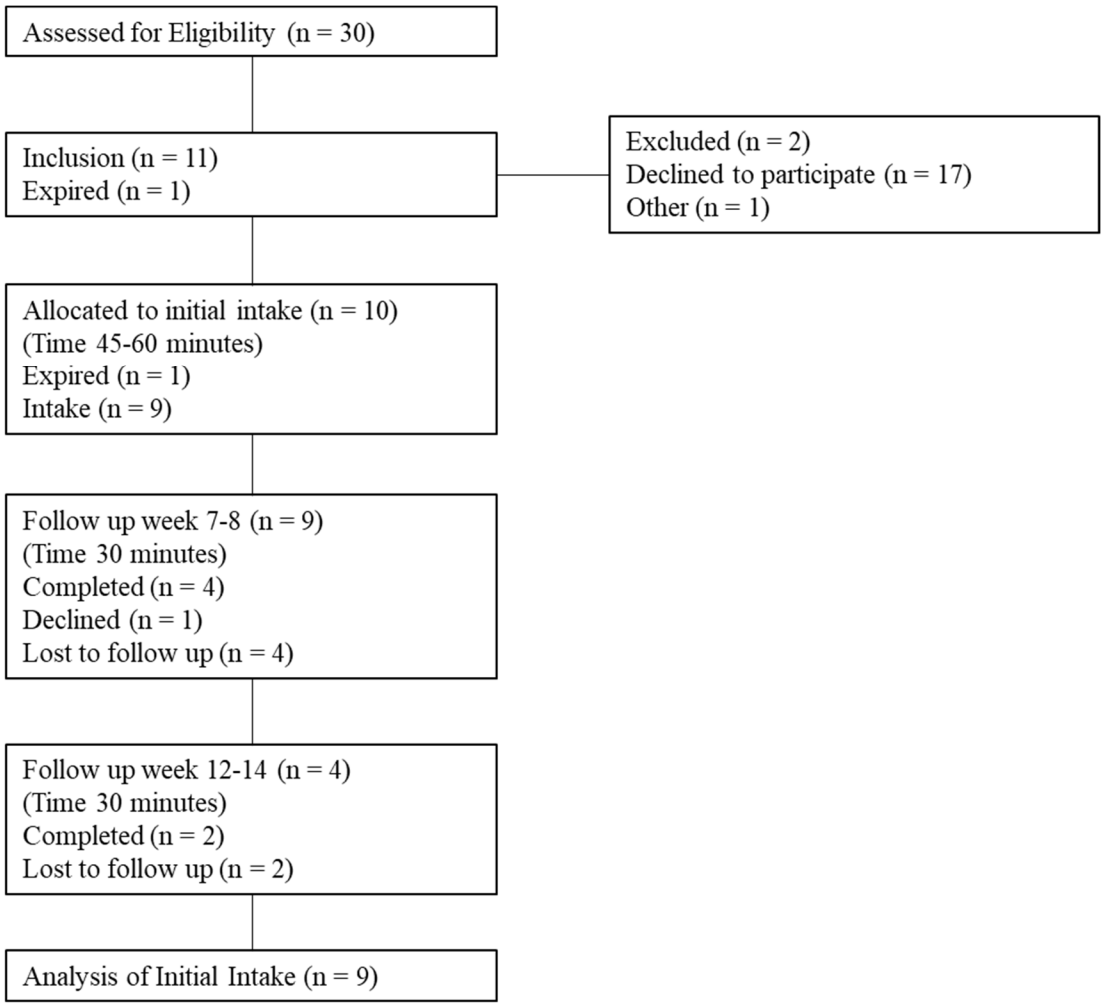

Figure 13: Flow Diagram

Conclusions

The sample size was small but did show some significance. Regarded the analysis of the diagnosis of head and neck cancer impacting the onset of PTSD symptoms; there was significance between civilian and sickness PTSD.

Analysis of the data presented two groups of individuals: one with malignant neoplastic cells and one with non-malignant neoplastic cells. A two-sample t-test determined that on average the PTSD scores between the malignant cell group and the non-malignant cell group was statistically non-significant. Nevertheless, the average scores across the PTSD surveys in civilian PTSD, sickness PTSD, and military PTSD were higher in the malignant cancer patients.

The frequency of self-reported anxiety and depression was analyzed. A correlation coefficient did demonstrate a significant statistical relationship between the two variables of anxiety and depression, which confirms the research studies that state anxiety and depression are correlated. Also, there was a high significance between sickness PTSD and saliva quality and shoulder pain. And a high percent of participants reported a poor quality of life for overall health. Regardless, the majority of the study results were not statistically significant.

CHAPTER 5

Discussion

This was a pilot study for feasibility, acceptability, and practicality of a descriptive correlative analysis of adaptation to head and neck cancer in the veteran population. The intent was to formulate a study that would measure access to participant population, demonstrate willingness to participate, and test a study protocol and procedure plan acceptable by the participants.

Access to participant population was limited to a single clinical setting, the Detroit VA locality, which did include some aspect of the Ann Arbor location due to medical service availability and accessibility, as the medical services in specific locations

were open to appointment times and surgical availability to expedite care. Assessment of study feasibility was identified when medical staff appeared unlikely to recruit participants. The attempt by PI and Co-PI to encourage clinics to identify participants was largely ignored. Willingness to participate in the study was tenuous as a portion of the sample of participants available were defensive when approached by the PI for inclusion into the study offering comments like, “I don’t want to talk about it”, “I want to be left alone”, and “I don’t think I can help you”. Those who did choose to participate were very forthright and willing to express their stories. And those who did participate completed the study protocol and procedure within a forty-five minute to one-hour time frame and were anxious to talk afterwards. The proposed study was intended to be longitudinal including three points over time. Participant retention was a problem. Participant participation was hampered due to inability to contact participants over time, therefore, a mail out packet was generated and sent to listed and confirmed addresses. Of the nine packets mailed out, three were completed and received, one was returned with a note stated that the participant could no longer participate in the study, and four packets were never returned. As a result, data happened to be missing due to the longitudinal aspect of the study, and thus only included initial survey responses.

Regardless of sample size, the findings did show significance. The diagnosis of head and neck cancer involves the areas (tissues, organs, and structures) from scapular to crown of head not including the brain. According to Aro and colleagues (2015), cancers of the head and neck are multidimensional, with many surgical options and treatments. This corresponds with the findings in this sample (table 4.2).

Research Question 1. Does the diagnosis of head and neck cancer impact the onset of PTSD symptoms as measured by the PTSD-PCL measurement tool?

Post-traumatic stress disorder follows traumatic events, which may have occurred in any lifetime experience associated with civilian life, military life and or illness. It is defined by a trauma exposure and the symptom clusters characteristic of the disorder (Sayed, Iacoviello, & Charney, 2015). PTSD in civilian life is linked with encounters of abuse, violence, illness, or social disorder and confusion. According to Sayed, et al. (2015), 89.7% of Americans had a lifetime traumatic exposure of some kind with a lifetime PTSD prevalence of 8.3%.

PTSD in military life is associated with life threatening and combat experiences. It is considered a "signature wound" for the United States veteran population. Prospective studies of the military population show up to 15% of service members experience PTSD (Donoho, Bonanno, Porter, Kearney, & Powell, 2017).

PTSD in illness is aligned with symptoms, diagnosis, and treatment of a disease process. Peters (2017) cites the incidence of illness PTSD statistic at 21.7% at 6-months clinical follow up. In a meta-analysis on PTSD and cancer (Swartzman, Booth, Munro, Sani, 2016), cancer survivors had a higher chance of PTSD defined by the DSM-IV criteria. Swartzman et al. (2016) compared twelve studies of any cancer diagnosis and identified the rate of PTSD at 6.2% higher in cancer survivors versus individuals within a traumatic stress framework with no history of cancer.

The research on cancer related PTSD is limited. And the research on head and neck cancer in the military population is scant. Mulligan, Schuster, Naik, Gosian, and Moye (2014) identified cancer as a traumatic stressor and observed up to 65.9% of

veterans with a head and neck cancer, gastro-esophageal cancer, or colorectal cancer perceived cancer to be a traumatic stressor with potential for death, injury, or compromise of physical integrity along with fear and vulnerability.

In the current study, the results of the PTSD-PCL survey were 22% of the subject population was positive for PTSD. The results indicate the relevance of a pre-cancer diagnosis trauma and diagnosis trauma correlated to sensory stimuli triggering prior trauma symptoms, as well as a correlation between civilian PTSD and illness PTSD. According to the 2014 study by Wachen, et al., veterans diagnosed with head and neck cancer have increased symptoms related to PTSD with up to 35% of the symptoms being associated with diagnosis, treatments, advanced cancer stage, and psychiatric history. Since the physiology of the human system is limited in its ability to produce a physical response to traumatic events, sensory stimuli promoting a neuro-chemical reaction regulates symptom occurrence. Because of this, trauma symptoms are fluid; potentially transferring from civilian experience to military experience to illness experience and vice versa (not in any particular order). Given the small sample size the significance of these test results was inconclusive.

Research question 2: Is there a correlation between anxiety and depression as measured by the GAD-7, and the PHQ-9 in the head and neck cancer patient at time of diagnosis?

Generalized anxiety is characterized by excessive worry with increased frequency, intensity and the inability to control it. It is associated with significant distress regarding future life events. Turmoil, hypervigilance, fear, startle, tension are some of the symptoms of anxiety. Symptoms also include an autonomic response with hyperactivity of the autonomic system. The HPA area of the brain and certain

neurotransmitters are involved in generalized anxiety disorder. Gamma-aminobutyric acid (GABA) receptors seem to be densely congregated in areas of the brain concerned with fear and anxiety. Decreased GABA activity and increased norepinephrine, a primary neurotransmitter in fight or flight response are part of the neurobiology theory related to generalized anxiety disorder. Other neurotransmitters involved are serotonin and cortisol. Low levels of serotonin and elevated levels of cortisol are important biomarkers involved in the systemic response to anxiety. High rates of anxiety are found in the head and neck cancer patient at time of diagnosis.

The incidence of depression in the head and neck cancer patient can be as high as 44% (Chan, Lua, Starmer, Sun, Rosenblatt, Gourin, 2011). Depression is a neuroendocrine disorder associated with the head and neck cancer patient. It is a response to stressful life events such as the diagnosis of cancer. The high mortality rate of head and neck cancer, the disfigurement and dysfunction associated with this type of cancer can cause depressive symptoms. Depression has a genetic and environmental component and can occur in patients with increased vulnerability due to dysregulation and hyper reactivity of the stress hormone axis (Zimmaro, Sephton, Siwik, Phillips, Rebholz, Kraemer, and colleagues, 2018). Symptoms of depression overlap with symptoms of head and neck cancer. This may be related to disease or treatments.

The results agree with the correlation between anxiety and depression and suggest that anxiety as related to worry was aligned with depression. The two participants with the highest GAD-7 scores were the same participants with moderately severe depression to severe depression. The same participants showed depression caused by functional disabilities, which was bothersome, but did not necessarily cause anxiety.

The study confirms findings from Friedman (2013) citing individuals diagnosed with post-traumatic stress disorder have an 80 % increase of being diagnosed with depression. Jacobson and Newman (2016) observed the co-occurrence of depression with anxiety symptoms are often correlated. This study was significant for correlation between depression and anxiety.

Research question 3. What symptoms are most frequently declared in head and neck cancer patients measured by the UW-QOL-HNC correlated with PTSD scores at initial diagnosis?

The UW-QOL-HNC survey is divided into two sections: physical function and social-emotional function. Depending on cancer location, physical function (chewing, swallowing, speech, taste, saliva and appearance) was altered due to tumor location and the different treatment modalities. Social-emotional function (anxiety, mood, pain, activity, recreation and shoulder function) was also involved in changes that occur in quality of life. Surgery, chemotherapy, and radiation change physical, emotional, and social function creating a sense of loss of control. Table 4.9 shows the percentage of subjects that experience problems with the different domains and its effects. With the majority of participants indicating physical function was acceptable by selecting “none” to “mild” results. This may be due to symptoms that affect physical function being controlled through management of medical therapies. On the other hand, social-emotional function was somewhat bothersome in the areas of mood, anxiety, recreation, and activity with participants selecting “moderate” to “severe” options. The value of loss of control in a social setting causes an emotional response triggering the symptoms of PTSD. PTSD symptoms are known to initiate anxiety and alter mood, which have an effect on the

ability of the participant to involve themselves in social/recreational activities. Medical therapies have the potential to help alleviate psychological distress through medication management and cognitive therapies. Participants do not always accept these modalities.

Research question 4. Question 4 analyzed the correlation between symptoms of anxiety, quality of life, and symptoms of post-traumatic stress disorder as measured by the GAD-7, UW-QOL-HNC and the PTSD-PCL, in head and neck cancer patients at time of diagnosis?

Subjects approached for inclusion into the study appeared guarded and cautious about personal experiences, yet were willing to discuss their illnesses and psychosocial situations. Two subjects (22%) expressed childhood experiences and life experiences (including illness) as being very traumatic having a profound effect on them or their families. Situations regarding military life were informational and referred to battle buddies (comrades who fought with them side-by-side), their platoons, and situations as worthy and respectable, stopping short of elaborating on details, specifically violent or visceral ones. This may be why a significant correlation between civilian PTSD and illness PTSD but not military PTSD was observed.

According to Hirsch et al, (2013), anxiety is defined as excessive worry that is uncontrollable. Uncontrolled worry is an attempt to control unsure and random outcomes. Participants appeared tense, anxious, and avoided eye contact while speaking with PI. All participants excused their physical deficits when invited into the study. The participants were allowed to choose meeting places and times. PI complied with specific environmental requests according to needs. Eight of the subjects chose areas within the VA hospital systems in an effort to limit PI travel to distant places. PI interviewed one

subject in their current living environment at the time. The same subject met with PI at arms two and three in two different locations within a 12-week period of time. Instability of living environments was common with five of the nine subjects having moved within the timeframe of diagnosis and first treatment. The excessive worry about physical, emotional, and environmental deficits were evident in participants' verbal representations of self.

Seventy-eight percent of the participants tested positive for depression. The study cites the multiple body systems affected by the neuroendocrine system response triggered by depression. Depression in the head and neck cancer population may be due to loss of function, social embarrassment related to disfigurement from cancer or treatments, and the high rate of morbidity and mortality of the head and neck cancer patient. Depression can be common in individuals who experienced a life altering stressor. In this population, the connection between anxiety, depression, and PTSD triggered a top down response based on sensory intake from a perceived experience, creating a neuroendocrine response. The response influenced a hormonal interplay attempting to regulate the system. Repetitive hits increased the system's load of biochemical indicators causing the system to adjust in response to homeostatic regulation. Over time, and depending on a number of factors (environmental exposures, psychological experience, and spiritual experience) homeostatic regulation changed.

Implications for study theory.

In the current study, the relations observed were not what were predicted. The study did show a correlation between PTSD in civilian experiences and PTSD related to illness/sickness, however, a correlation between PTSD in military situations and civilian

life, as well as PTSD in military situations and illness, was not significant. A further study would focus on civilian life traumas both pre-military and pre-illness, as well as post military and post illness as an important component of the study theory for the systems response to events occurring over time.

As predicted and based on current research, the study did show a correlation between depression and anxiety. Future studies utilizing a larger power would continue to include depression, anxiety, and PTSD (military, civilian, illness) in an effort to research the correlations and the effects of these stress responses on the system over time.

This study was a descriptive correlative analysis of post-traumatic stress disorder, depression and anxiety in a head and neck cancer veteran population. The theory of adaptation to head and neck cancer in the veteran population focused on the stress response in the biological system. The physical system produces neurotransmitters, hormones, and bio-chemicals to maintain homeostasis. The response to these chemicals is not exactly the same across individuals. Using surveys and questionnaires the study investigated participant's response to distressing signals and symptoms specific to post traumatic stress disorder. The study also investigated anxiety and depression correlated to PTSD and head and neck cancer.

Sensory stimulation is a constant steady state of the system. As the organism perceives sound, light, smell, taste, and tactile stimulation the nervous system selectively responds by initiating nerve impulses on the cerebral cortex and sending those impulses to the hypothalamus, pituitary, and adrenal cortex. These signals cause the neuroendocrine cells and system organs to react and release specific hormones and chemicals throughout the body. In other words, during distress or eustress the system

undergoes the same nonspecific response to the stimulus acting upon it. A fight or flight, as well as an autonomic nervous system response potential, are initiated. Adaptation to the homeostatic reaction occurs when repetitive hits of a "same nonspecific stress response to any demand on the system" occur. The symptoms of anxiety, depression, hyper-arousal, hyper-vigilance, restlessness, and fatigue are physical responses to the influx of specific neurotransmitters, hormones, and biomarkers. The study sample was small but did show significance between PTSD-civilian and PTSD-illness. There was also a correlation between anxiety and depression.

The physical response is changeable and precisely measurable. Physical measurements are obtainable quantitatively via medical equipment and laboratory data. The process of adaptation can be exhausted leading to an inability to adapt further. While the influence of these neuro/biological chemicals and hormones is normally well tolerated, over time prolonged sensory interactions cause an inability to further adapt creating "diseases related to adaptation", which lead to pathogenesis. The study potentially indicates stress related system responses associated with repetitive hits of same biophysical reactions to stressors leading to pathology. A future study would incorporate an analysis of physical parameters and biomarkers that trigger symptoms. Those physical parameters and biomarkers would analyze the systems metabolic changes and catecholamine levels over time.

Implications for research

Implications for theory development and practice need to include physiologic parameters focusing on homeostatic responses. The incorporation of specific biomarkers (urine, sputum, blood), such as cortisol and serotonin, as well as physical parameters that

measure stress responses to symptoms and disease processes should be included into the study protocol. These physical parameters include tracking of physical measurements on stress response, for example, blood pressure, blood sugars, skin temperature, diaphoresis, as well as, certain inflammatory biomarkers measured in blood samples (CRP/Westergren) would allow clinicians to interpret participants allostatic load and homeostatic adaptation responses.

Strengths and Limitations

Strengths

The study supports the theoretical framework regarding anxiety and depression aligning with a post-traumatic stressor in the presence of a cancer diagnosis. The National Institute for Health Research suggests that the percentage of eligible participants recruited into a study of individuals soon after serious diagnosis or start of treatment to be 30% - 50%. Thirty percent of the subjects identified were recruited into the study. Consent time and initial survey time took approximately 45 minutes to complete. Survey times in weeks 7-8-survey and weeks 12-14 (limited sample) took about 25-30 minutes to complete.

Limitations

The limitations of the study were failure to recruit sufficient numbers of participants within study interval due to small number of patients and a competing study with the same patient population. A future study will be feasible with regard to recruitment if it is designed as a multicenter project.

Veteran care is fluid throughout the VA system meaning services are provided and can be transferred across VA facilities (not optimal but may be related to VA availability or patient choice).

Future Study

A future study includes multiple sites. A successful study would incorporate all CBOC's and hospital settings in the VISN 10 system. The goal for a future study is to secure a funding source, and incorporate the Veterans Affairs national database into the research proposal to capture an adequate subject population to study the aims and objectives of interest. The use of survey software is another option for survey intake via the Internet. Clinic and hospital screeners and research assistance would provide needed support for participant identification and consent, data collection, computer input, and statistical analysis.

Conclusion

Post-traumatic stress disorder continues to be a concern for the military population in general. The VA system is invested in monitoring the experience of PTSD by surveying the veteran patient population with regularity. In this study, military PTSD was not significant but did reveal a correlation between PTSD in civilian life with PTSD in illness experience. The VA uses cognitive behavioral therapy (CBT) to assist veterans to re-experience and change the outcome of a perceived event. The use of CBT may benefit the population experiencing civilian PTSD and illness PTSD by allowing them to reprocess trauma and change the outcome of events easing re-experiencing, vigilance, flashbacks, sleep disturbance, and anxiety.

The human system functions under homeostatic maintenance through physiologic pathways. Repetitive hits cause same physical responses resetting homeostatic/allostatic balance within the system. Over time the physical readjustments create symptoms producing an alarm reaction. That alarm reaction influences the person to respond to uncomfortable symptoms. Delivery of care is carried out over time. Data collection on impact of disease on participant's well-being and the adaptive response is of importance in clinical practice allowing the medical team to understand the impact of the illness on subjects' well-being and their ability to adapt to situations. Research that includes the study of biological samples and monitoring physiologic patterns could lead to an understanding of the effects of the allostatic load/overload that occurs in cancer disease.

Because the VA healthcare system is a very large and complex system, the ability for the veteran population to seek care in the civilian health care market may quicken diagnosis and mitigate some of the malignancies that occur. In the near future, the VA is aligning with the civilian systems in order to streamline health care services for the veteran population. The plan is to allow for stricter monitoring of symptoms, allowing for quicker response times related to symptom management and disease care.

APPENDIX

Appendix A: PTSD-PCL-S

PCL-S

The event you experienced was _____ (event) on _____ (date).

INSTRUCTIONS: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Repeated, disturbing *memories, thoughts,* or *images* of the stressful experience?	1	2	3	4	5
2.	Repeated, disturbing *dreams* of the stressful experience?	1	2	3	4	5
3.	Suddenly *acting* or *feeling* as if the stressful experience *were happening again* (as if you were reliving it)?	1	2	3	4	5
4.	Feeling *very upset* when *something reminded you* of the stressful experience?	1	2	3	4	5
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of the stressful experience?	1	2	3	4	5
6.	Avoiding *thinking about* or *talking about* the stressful experience or avoiding *having feelings* related to it?	1	2	3	4	5
7.	Avoiding *activities* or *situations* because *they reminded you* of the stressful experience?	1	2	3	4	5
8.	Trouble *remembering important parts* of the stressful experience?	1	2	3	4	5
9.	*Loss of interest* in activities that you used to enjoy?	1	2	3	4	5
10.	Feeling *distant* or *cut off* from other people?	1	2	3	4	5
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?	1	2	3	4	5
12.	Feeling as if your *future* will somehow be *cut short*?	1	2	3	4	5
13.	Trouble *falling* or *staying asleep*?	1	2	3	4	5
14.	Feeling *irritable* or having *angry outbursts*?	1	2	3	4	5
15.	Having *difficulty concentrating*?	1	2	3	4	5
16.	Being "*super-alert*" or watchful or on guard?	1	2	3	4	5
17.	Feeling *jumpy* or easily startled?	1	2	3	4	5

PCL-S for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division

Appendix A: PTSD-PCL-M

PCL-M

INSTRUCTIONS: Below is a list of problems and complaints that veterans sometimes have in response to stressful military experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Repeated, disturbing *memories, thoughts,* or *images* of a stressful military experience?	1	2	3	4	5
2.	Repeated, disturbing *dreams* of a stressful military experience?	1	2	3	4	5
3.	Suddenly *acting* or *feeling* as if a stressful military experience *were happening again* (as if you were reliving it)?	1	2	3	4	5
4.	Feeling *very upset* when *something reminded you* of a stressful military experience?	1	2	3	4	5
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of a stressful military experience?	1	2	3	4	5
6.	Avoiding *thinking about* or *talking about* a stressful military experience or avoiding *having feelings* related to it?	1	2	3	4	5
7.	Avoiding *activities* or *situations* because *they reminded you* of a stressful military experience?	1	2	3	4	5
8.	Trouble *remembering important parts* of a stressful military experience?	1	2	3	4	5
9.	*Loss of interest* in activities that you used to enjoy?	1	2	3	4	5
10.	Feeling *distant* or *cut off* from other people?	1	2	3	4	5
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?	1	2	3	4	5
12.	Feeling as if your *future* will somehow be *cut short*?	1	2	3	4	5
13.	Trouble *falling* or *staying asleep*?	1	2	3	4	5
14.	Feeling *irritable* or having *angry outbursts*?	1	2	3	4	5
15.	Having *difficulty concentrating*?	1	2	3	4	5
16.	Being "*super-alert*" or watchful or on guard?	1	2	3	4	5
17.	Feeling *jumpy* or easily startled?	1	2	3	4	5

PCL-M for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division

Appendix A: PTSD-PCL-C

PCL-C

INSTRUCTIONS: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Repeated, disturbing *memories, thoughts,* or *images* of a stressful experience from the past?	1	2	3	4	5
2.	Repeated, disturbing *dreams* of a stressful experience from the past?	1	2	3	4	5
3.	Suddenly *acting* or *feeling* as if a stressful experience *were happening again* (as if you were reliving it)?	1	2	3	4	5
4.	Feeling *very upset* when *something reminded you* of a stressful experience from the past?	1	2	3	4	5
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of a stressful experience from the past?	1	2	3	4	5
6.	Avoiding *thinking about* or *talking about* a stressful experience from the past or avoiding *having feelings* related to it?	1	2	3	4	5
7.	Avoiding *activities* or *situations* because *they reminded you* of a stressful experience from the past?	1	2	3	4	5
8.	Trouble *remembering important parts* of a stressful experience from the past?	1	2	3	4	5
9.	*Loss of interest* in activities that you used to enjoy?	1	2	3	4	5
10.	Feeling *distant* or *cut off* from other people?	1	2	3	4	5
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?	1	2	3	4	5
12.	Feeling as if your *future* will somehow be *cut short*?	1	2	3	4	5
13.	Trouble *falling* or *staying asleep*?	1	2	3	4	5
14.	Feeling *irritable* or having *angry outbursts*?	1	2	3	4	5
15.	Having *difficulty concentrating*?	1	2	3	4	5
16.	Being "*super-alert*" or watchful or on guard?	1	2	3	4	5
17.	Feeling *jumpy* or easily startled?	1	2	3	4	5

PCL-C for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division

Appendix B: GAD-7

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems? *(Use "✓" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

(*For office coding: Total Score T*____ = ____ + ____ + ____ + ____)

Appendix C: PHQ-9

The Patient Health Questionnaire (PHQ-9)

Patient Name _____ Date of Visit _____

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself - or that you're a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
Column Totals	_____ +	_____ +	_____	
Add Totals Together	_____			

10. If you checked off any problems, how difficult have those problems made it for you to Do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult

Appendix D: SF-8

Date_____ **Name**_____

SF-8™ Health Survey

This survey asks for your views about your health. This information will help you keep track of how you feel and how well you are able to do your usual activities.
Answer every question by selecting the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.
For each of the following questions, please mark an [x] in the one box that best describes your answer.

1. Overall, how would you rate your health during the **past 4 weeks**?

Excellent | Very Good | Good | Fair | Poor | Very Poor

2. During the **past 4 weeks**, how much did physical health problems limit your usual physical activities (such as transfers or going places)?

Not at all | Very little | Somewhat | Quite a lot | Could not do physical activities

3. During the **past 4 weeks**, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?

Not at all | Very little | Somewhat | Quite a lot | Could not do daily work

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

None | Very mild | Mild | Moderate | Severe | Very severe

5. During the **past 4 weeks**, how much energy did you have?

Very much | Quite a lot | Some | A little | None

6. During the **past 4 weeks**, how much did your physical health or emotional problems limit your usual social activities with family or friends?

Not at all | Very little | Somewhat | Quite a lot | Could not do social activities

7. During the **past 4 weeks**, how much have you been bothered by **emotional problems** (such as feeling anxious, depressed or irritable)?

Not at all | Slightly | Moderately | Quite a lot | Extremely

8. During the **past 4 weeks**, how much did personal or emotional problems keep you from doing your usual work, school or other daily activities?

Not at all | Very little | Somewhat | Quite a lot | Could not do daily activities

Thank you for completing these questions.

Revised per Fox 03/14/2012

Appendix E: UW-QOL-HNC

Name: _____
Date: _____

University of Washington Quality of Life Questionnaire
(UW-QOL)

This questionnaire asks about your health and quality of life **over the past seven days**. Please answer all of the questions by checking one box for each question.

1. **Pain**. (Check one box: ☑)

   I have no pain.
   There is mild pain not needing medication.
   I have moderate pain - requires regular medication (codeine or nonnarcotic).
   I have severe pain controlled only by narcotics.
   I have severe pain, not controlled by medication.

2. **Appearance**. (Check one box: ☑)

   There is no change in my appearance.
   The change in my appearance is minor.
   My appearance bothers me but I remain active.
   I feel significantly disfigured and limit my activities due to my appearance.
   I cannot be with people due to my appearance.

3. **Activity**. (Check one box: ☑)

   I am as active as I have ever been.
   There are times when I can't keep up my old pace, but not often.
   I am often tired and have slowed down my activities although I still get out.
   I don't go out because I don't have the strength.
   I am usually in bed or chair and don't leave home.

4. **Recreation**. (Check one box: ☑)

   There are no limitations to recreation at home or away from home.
   There are a few things I can't do but I still get out and enjoy life.
   There are many times when I wish I could get out more, but I'm not up to it.
   There are severe limitations to what I can do, mostly I stay at home and watch TV.
   I can't do anything enjoyable.

5. **Swallowing**. (Check one box: ☑)

   I can swallow as well as ever.
   I cannot swallow certain solid foods.
   I can only swallow liquid food.
   I cannot swallow because it "goes down the wrong way" and chokes me.

6. **Chewing**. (Check one box: ☑)

   I can chew as well as ever.
   I can eat soft solids but cannot chew some foods.
   I cannot even chew soft solids.

7. **Speech.** (Check one box: ☑)

My speech is the same as always.
I have difficulty saying some words but I can be understood over the phone.
Only my family and friends can understand me.
I cannot be understood.

8. **Shoulder**. (Check one box: ☑)

I have no problem with my shoulder.
My shoulder is stiff but it has not affected my activity or strength.
Pain or weakness in my shoulder has caused me to change my work.
I cannot work due to problems with my shoulder.

9. **Taste.** (Check one box: ☑)

I can taste food normally.
I can taste most foods normally.
I can taste some foods.
I cannot taste any foods.

10. **Saliva**. (Check one box: ☑)

My saliva is of normal consistency.
I have less saliva than normal, but it is enough.
I have too little saliva.
I have no saliva.

11. **Mood**. (Check one box: ☑)

My mood is excellent and unaffected by my cancer.
My mood is generally good and only occasionally affected by my cancer.
I am neither in a good mood nor depressed about my cancer.
I am somewhat depressed about my cancer.
I am extremely depressed about my cancer.

12. **Anxiety**. (Check one box: ☑)

I am not anxious about my cancer.
I am a little anxious about my cancer.
I am anxious about my cancer.
I am very anxious about my cancer.

Which issues have been the most important to you during the past 7 days?
Check ☑ up to 3 boxes.

Pain	Swallowing	Taste
Appearance	Chewing	Saliva
Activity	Speech	Mood
Recreation	Shoulder	Anxiety

GENERAL QUESTIONS

Compared to the month before you developed cancer, how would you rate your health-related quality of life? (check one box: ☑)

- Much better
- Somewhat better
- About the same
- Somewhat worse
- Much worse

In general, would you say your **health-related quality of life** during the past 7 days has been: (check one box: ☑)

- Outstanding
- Very good
- Good
- Fair
- Poor
- Very poor

Overall quality of life includes not only physical and mental health, but also many other factors, such as family, friends, spirituality, or personal leisure activities that are important to your enjoyment of life. Considering everything in your life that contributes to your personal well-being, rate your **overall quality of life** during the past 7 days. (check one box: ☑)

- Outstanding
- Very good
- Good
- Fair
- Poor
- Very poor

Please describe any other issues (medical or nonmedical) that are important to your quality of life and have not been adequately addressed by our questions (you may attach additional sheets if needed).

Appendix F: Demographics

ID# _____

DOB _____ AGE _____

Gender

1 Male _____

2 Female _____

9 Unknown _____

Race

1 AA _____

2 White _____

3 Hispanic _____

4 Asian _____

5 American Indian _____

6 Other _____

9 Unknown _____

Military Branch

1 Marine _____

2 Navy _____

3 Army _____

4 Air Force_____

5 Coast Guard _____

6 National Guard _____

9 Unknown

Education

1 High School _____

2 GED _____

3 Trade School _____

4 Some College _____

5 College _____

6 Graduate School _____

7 Post Graduate _____

9 Unknown

Employment

1 Full Time _____

2 Part Time _____

3 Retired _____

4 Unemployed _____

9 Unknown _____

Date of Diagnosis _____

Diagnosis _____

Diagnosis Code _____

Cancer Stage _____

Cancer Grade _____

Treatment	Treatment Date
1 Surgery _____	_____
2 Radiation _____	_____
3 Chemotherapy _____	_____
4 Radiation/Chemotherapy _____	_____
5 Surgery/Radiation _____	_____
6 Surgery/Chemotherapy _____	_____
7 Surgery/Chemo/Radiation _____	_____

8 NONE _____

9 Unknown _____

PTSD-4 questionnaire

1 Positive _____

2 Negative _____

Comorbidities (please circle)

1 Depression	5 Bipolar disease
2 Diabetes	6 Schizophrenic diseases
3 Heart Diseases	7 Hypercholesterolemia

4 Neurologic Diseases

Medications (please circle)

1 Antidepressants

2 Cardiac

3 Diabetes

4 Neurologic Medications

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ABSTRACT

ADAPTATION TO HEAD AND NECK CANCER IN THE VETERAN POPULATION: A PILOT STUDY

by

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Major: Nursing

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Post-traumatic stress disorder in the head and neck cancer veteran population may present a challenge to adaptation during diagnosis and treatment of illness. The evaluation of post traumatic stress disorder, anxiety, depression and quality of life were examined and correlated against symptom occurrence and triggering of post traumatic symptoms across experiences. A significant correlation between PTSD-C and PTSD-S was found ($r = 0.91$, $p = 0.001$); there was a non-significant correlation between PTSD-M and PTSD-C; and a non-significant correlation between PTSD-M and PTSD-S. A significant correlation between anxiety and depression was found ($r = 0.94$, $p < 0.0001$). Physical dysfunction/function at time of diagnosis, during treatments and after treatments was acceptable to the veteran while social-emotional function was bothersome due to mood, anxiety, recreation, and activity. Most of the calculated correlation coefficients were in small to moderate range, none were statistically significant at a 0.05 level. However, there were two high level correlations between sickness PTSD and saliva ($r = 0.52$) and between sickness PTSD and shoulder ($r = 0.52$).

The sample size was small. Most of the correlation coefficients between the PTSD subscale scores were not statistically significant. There are few studies of head and neck cancer in the veteran population correlated with post-traumatic stress disorder in this highly visible disease process that affects functional and social-emotional ability in the veteran patient. Research into this population of veterans needs to be considered due to the important implications in treatment development for head and neck cancer veterans with post-traumatic stress disorder.

Key words: Head and neck cancer, post-traumatic stress disorder, anxiety, depression

AUTOBIOGRAPHICAL STATEMENT

My name is Diane Sobecki-Ryniak. I have been a nurse for twenty-four years. I have had a very eclectic nursing history. My experiences began in the obstetrics gynecology area and moved to labor and delivery at a suburban community hospital in the greater Detroit area. I then went to a hospital supervisory role and a visiting nursing in a company with a 50-year history of home care within the Detroit community. After that, I had a small influence in a skilled nursing facility as associate director/director of nursing. From there I moved to case management and formulated a role in a hospital for case management in the ER/outpatient OR/ambulatory area/labor and delivery areas. The experience moved me into an acute care environment where I became invested in long term acute care and wound care. Finally, I moved into the veteran affairs system as a palliative care and rehabilitation nurse. I transferred within the system to ambulatory care, where my focus is PTSD, cancer, and pain.

My education history includes University of Michigan School of Nursing graduating Cum Laude and associating with Sigma Theta Tau. I then decided to further my education and enrolled at Wayne State University in the Community Medicine program, which was converted to the Public Health Program. I was in the first graduating class for Masters of Public Health at Wayne State. Wanting to further my education and contribute to the science of nursing, I was accepted into the Wayne State College of Nursing Doctorate Program.

I am interested in advancing the science of nursing. My future goals are to continue research within the VA system with a focus on PTSD, cancer and pain.