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Burnout In Radiation Therapy: Examining The Six Leading Influences

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BURNOUT IN RADIATION THERAPY: EXAMINING THE SIX LEADING INFLUENCES

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ABSTRACT

Recent studies are highlighting the dangers of burnout amongst healthcare workers, including radiation therapists. Since burnout is associated with an increase in medical errors (Sanchez-Reilly, 2013), it affects both the well-being of the patient and patient satisfaction scores, which are important to a hospital's reputation. Burnout has a positive correlation with job dissatisfaction and increased employee turnover, making it both a financial and quality issue. Organizations acknowledge that burnout leads to unhappy employees, and unhappy employees are less likely to be engaged in their work, thereby not producing the best "products" (Sehlen, 2009). By examining which components seem to be the most influential on pronounced expressions of burnout, leadership can focus on reducing the major influences effect on their employees.

The purpose of my mixed methods study was to discover which of the six influences were most powerful in impacting burnout in radiation therapists, and how oncology leadership could manipulate workplace factors to provide a better work environment for radiation therapists.

The study involved the use of two validated survey tools, the Maslach Burnout Inventory (MBI-HSS) and the Areas of Work-life scale to determine what level of burnout was evident in the radiation therapists (RTs) at Sharp Healthcare, and which work-life factors seem to be most

influential in causing burnout. Demographic information was also gathered with the MBI survey. Qualitative data was also collected though structured interviews with the radiation oncology leadership, by examining the group results of the surveys and offering suggestions on organizational changes for improvement.

The results of the burnout survey (MBI-HSS) showed a moderate score for Emotional Exhaustion (EE), a low score for Depersonalization (DP) and a high score for Personal Accomplishment (PA). The MBI scores for the RTs at Sharp scored more favorable than the national norms in all sections. The results for the AWL indicated that the Sharp RTs show a positive job-person fit, scoring above the value of 3 in all six areas of work-life. Chi squared tests showed strong significance of the demographic information collected, such as age, education, employment status, gender and years of experience, and therefore the null hypothesis was rejected. One-way ANOVA showed linear correlations with all demographic determinants except for age. Qualitative data collected through structured interviews examined the group results for both surveys with the oncology leaders for insight on the results, and for suggestions on organizational change to reduce burnout. The leader's common suggestions indicated that a greater involvement of the RTs in department decisions could help reduce expression of burnout due to the influence of control in the workplace. A greater focus on workload and department staffing was also suggested by the leader majority to account for overtime and accommodate unpredictable cases, which adds to the workload burden of regular staff RTs.

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CHAPTER ONE

INTRODUCTION

Healthcare workers face many challenges today including budget cuts, the impending baby boom retirement expected to cause staffing shortages, and the personal burden of caring for patients who are ill. Healthcare workers who are in particular jeopardy are those who take care of terminal patients, and cancer care workers fall into this category.

Burnout, characterized as a compilation of emotional exhaustion or fatigue, depersonalization, and loss of meaning or purpose in work, can lead to loss of job satisfaction and ill health. The initial presentation of burnout is often emotional exhaustion, depleting one's ability to cope with job stress and increasing the level of negativity in the workplace, which leads to depersonalization. Depersonalization develops from extended levels of job stress where the workers feel they can no longer extend personal feelings or emotions to their patients, and often overflows into their relationships with coworkers. The last phase of burnout is often reduced personal accomplishment which results from increased cynicism and judgment of others within the workplace, decreasing one's own love for their work (Leiter and Maslach, 2014).

Caring for terminally ill patients puts workers at a higher probability of developing compassion fatigue (CF). According to the *Clinical Journal of Oncology Nursing* oncology workers experience this phenomenon more frequently than other healthcare workers due to their level of involvement with their patients who are terminally ill, and often facing end of life issues (Potter, 2010). Compassion fatigue has been defined as a healthcare workers' inability to connect with their patients on a personal level, which can cause decrease in job satisfaction, increases stress, and can lead to professional burnout. CF reduces one's ability to demonstrate

compassion for their patients, which in oncology where the majority of patients are working through a life altering event, is disadvantageous to the patients. According to Potter, burnout differs from CF as it is believed to be caused by prolonged workplace stresses and demands, as opposed to personal disconnections to the patients. Burnout results in physical, emotional, and mental exhaustion, having deleterious effects on a department where speed, accuracy, technical expertise, and compassion are integral to its functions.

Prevalence of burnout can lead to reduced patient satisfaction scores and effectiveness of care (Shanafelt, 2014, Sanchez-Riley, 2013), and has been linked to increasing workplace errors either due to a reduction of focus to the job at hand or increased judgments of coworkers, perpetuating a negative work environment. Exhaustion due to burnout puts both the patients and their care at risk, and affects the general environment in which health care workers function. According to the *Journal of Supportive Oncology*, burnout is a greater predictor than depression in estimating job satisfaction and can relate to poorer health of the provider. This correlates into an increase in medical errors and inevitably a decrease in patient satisfaction (Sanchez-Reilly, 2013)

Leiter and Maslach (2014) outlined six work life factors that influence burnout, namely manageable workload, autonomy, reward, fairness, support, and positive working relationships, all having varying influence on a health care worker's perception of their work environment. *Manageable workload* has been known to affect workplace stress due to increasing responsibilities of the workers, without further resources or support. This can be a fluctuating patient load, or change in patient acuity to which the oncology worker is not accustomed or properly prepared. A manageable workload means having sufficient time to address the requirements for the role, and with increasing patient load and technical complexity in oncology,

intertwined with a decrease in funding for staffing, this is a very prominent influence. Workload can also negatively affect the next influence of burnout, which is *control*. Workers admit that their level of control, or *autonomy*, within a situation causes a great level of stress if they possess insufficient authority to make decision resulting in the best care for the patients. Both *reward* and *fairness* can affect burnout, as employees want to be recognized for work well done, and feel that work is distributed equitably throughout the team. *Support* is the main influence in which leadership can have a direct effect. More than 114 studies have demonstrated that workplaces where staff feel supported and appreciated demonstrated a lesser degree of burnout and exhaustion (Leiter, 2014). Lastly, *positive working relationships* are also known to decrease the level of burnout exhibited in a workplace, which is in alignment with working in a supportive environment, and offers a protective factor against emotional exhaustion.

Through a greater understanding of these work-life factors and their impact on the work environment, the oncology leadership team can empower their organizations to prevent the onset of burnout by supporting staff in various ways that increase the employee's feelings of belonging and importance to the organization. Understanding which influences are most prominent in the onset of burnout can help focus resources on these factors individually and reduce the potential dangerous environments patients are exposed to while enduring oncology treatments.

Statement of the Problem

Radiation therapists, whose primary role is direct care for the oncology patient, experience burnout on multiple levels which can affect their job satisfaction, commitment to the organization, and resulting organizational success (Akroyd, 2002, Probst, 2012). Understanding which components are most influential in causing burnout can in turn help prevent this rampant phenomenon in oncology.

According to the *Journal of Clinical Oncology* (2014), which surveyed a population of US oncologists to assess occupational burnout, the dominant factor influencing burnout seems to be hours spent doing direct patient care (Shanafelt, 2014). Radiation Therapists have the dominant role in patient care within the department of radiation oncology, exceeding that of nurses or physicians, therefore supporting the assumption that hours spent in direct patient care impacts the prevalence of burnout in radiation therapists as well.

Radiation therapists manage busy and very restrictive patient treatment delivery schedules as well, which limits their autonomy within the department and often requires working under tremendous pressure to meet the needs of each patient in a timely fashion. Administrative pressure to reduce or eliminate overtime also limits the scope of the role of the radiation therapist, reducing their opportunity to deliver the level of care they feel their patients deserve.

The research surrounding burnout and radiation oncology shows that oncology workers, radiation therapists, and radiation oncologists, all express various levels of burnout. Understanding how professionals can reverse burnout amongst oncology staff, most specifically with radiation therapists, could help increase job satisfaction, patient satisfaction, and organizational effectiveness.

The problem this study addressed is that the literature did not specify which of the six influences had the greatest impact, specifically for radiation therapists, and therefore leadership in radiation departments did not have the information they needed to design improvement for their workers.

Purpose of the Study

The purpose of this mixed methodology study was to discover which of the six influences were most powerful in impacting burnout in radiation therapists, and how oncology leadership could manipulate workplace factors to provide a better work environment for radiation therapists.

Recent studies are highlighting the dangers of burnout amongst healthcare workers, including radiation therapists. Since burnout is associated with an increase in medical errors (Sanchez-Reilly, 2013), it affects both the well-being of the patient and patient satisfaction scores, which are important to a hospital's reputation. Burnout has a positive correlation with job dissatisfaction and increased employee turnover, making it both a financial and quality issue. Organizations acknowledge that burnout leads to unhappy employees, and unhappy employees are less likely to be engaged in their work, thereby not producing the best "products" (Sehlen, 2009). By examining which components seem to be the most influential on pronounced expressions of burnout, leadership can focus on reducing the major influences effect on their employees.

The purpose of my mixed methodology study was to discover which of the six influences were most powerful in impacting burnout in radiation therapists, and how oncology leadership could manipulate workplace factors to provide a better work environment for radiation therapists.

Research Question

Although any of the six influences of work life factors could have been deemed the most powerful in affecting burnout, there is interest in learning which factors had the greatest correlations in affecting burnout. My research looked at two questions.

Question One: Which of the six influences of burnout were most apparent in the radiation therapists at Sharp?

Health care workers express high levels of burnout. Radiation therapists rank high amongst those surveyed over several research studies, roughly expressing emotional exhaustion in more than a third of those surveyed (Hutton, 2014, Akroyd 2002, Grunfeld, 2000). What is not apparent in the literature is which of these factors influenced the expression of burnout the most, and where organizations could focus their resources to reduce its effectiveness by examining the influential components of their workplace.

Question Two: Which workplace improvements did oncology leaders suggest might reduce the expression of burnout amongst their staff? By providing leaders with the information obtained through the quantitative research, interpretations of why the results occurred, and where they could focus their organizational changes were discussed.

Methodology

A mixed methodology approach was used for this research. Two established and validated surveys developed by Christina Maslach and Michael Leiter, named the Maslach Burnout inventory (MBI-HSS) and the Areas of Work life scale (AWL) (Leiter, 2014), were conducted. In addition, 3 structured interviews to examine the results were conducted, specifically with those in supervisory roles to allow for better understanding of the level of burnout experienced in the population of therapists involved and leadership's current thinking regarding burnout reduction.

Conceptual Framework

The goal of the research was to discover and understand the prevalence of low job satisfaction and morale present in many radiation therapy departments, in particular to the radiation therapy profession. Radiation Therapists spend the majority of their day physically and emotionally treating cancer patients with radiation. Over the months of a course of treatment prescribed to the patient, bonds are developed between the therapist and the patient and can impact how the therapist completes their work and the satisfaction that comes from it. Patients who end treatment early to go to hospice, die in the middle of a treatment regimen, or need excessive physical care can impact the attitude and functionality of the care team over time, leading to burn out or compassion fatigue. This research sought to reveal what level of burnout radiation therapists were experiencing in the three radiation oncology departments within the Sharp organization, and which areas of influence had the most impact.

Understanding the prominent factors influencing burnout may impact administrative leadership support for programs to prevent burnout and maintain the emotional and physical well-being of the oncology workers, especially radiation therapists. My interest in developing such a program was the driving force for my research.

The theoretical frame work of this study was derived from both concepts of transformational leadership and the Areas of Work-Life Scale, described by Maslach and Leiter (2004) as a "grass roots, pragmatic conceptual frame work of a social problem that needed to be solved" (p.92). Transformational leadership theory was first mentioned in a 1978 book by James MacGregor Burns called "Leader". This theory describes a manner of leadership in where the leader and the followers teach each other with the intent of reaching the overarching goals together, with respect, inclusion and individuality. By using the areas of work-life as scaffolding

for addressing the various areas of work that may influence burnout, leaders can have a greater understanding of their followers, their needs, and intrinsic motivation. As a trained leader as well as a radiation therapist, I am continuously learning how my decisions affect the morale of the staff, but additional influences impacting their job satisfaction should be better understood. I wish to understand the details in terms of the major influences of burnout and to promote a more positive, supportive atmosphere for staff and patients.

Assumptions and Limitations

My role as a radiation therapist has had great influence on this study, although using structured surveys and established survey instruments has limited the bias of the results. Completing the research within my department, and other participating radiation oncology departments helped diminish limitations for results due to low participant number. Having held many roles in oncology from staff radiation therapist, to educator, to administrator, provided me with a more well-rounded understanding of each department and ultimately help me draw conclusions regarding the expression of burnout.

My master's degree in adult and organizational learning, as well as completion of numerous leadership theory courses within this program has lent perspective to how organizational dynamics either add or subtract from the burnout syndrome, and how organizational change could lead to the solutions towards increased job satisfaction.

Significance

Radiation therapists, whose primary role is direct care for the oncology patient, experience burnout on multiple levels which can affect their job satisfaction, commitment to the organization and organizational success. *The International Journal of Radiation Oncology, Biology, and Physics* published the only article identified relating to radiation therapist burnout

in the United states and indicates "human service workers who have considerable interaction with patient problems (psychological, social, and/or physical) are potentially more subject to chronic stress that can be emotionally draining and lead to burnout" (Akroyd, 2002, p. 816). This topic deserved attention not only because it affects job satisfaction of the radiation therapists, but also because burnout can lead to disengagement from occupation, contributing to an increase in medical errors and organizational ineffectiveness.

Studies on radiation therapy professionals worldwide indicate that roughly 30% of this health care population is experiencing emotional exhaustion (EE), 10% are experiencing depersonalization (DP) and 42% are reporting diminished personal accomplishment (PA) (Probst, 2012, Akroyd, 2002, Hutton, 2014, and Jasperse, 2014). Strongly demonstrating the three major components of burnout, it is apparent that radiation therapists are struggling with the effects of this syndrome, and therefore are at a greater risk of the pitfalls of burnout. This evidence shows that radiation therapy departments worldwide are struggling with the expression of burnout, and many administrators recognize the ramifications of burnout expression, namely employee turnover rates and sick time, which can be costly to an organization (Hutton, 2014, Probst, 2012, Akroyd, 2002). By focusing on the biggest influences affecting burnout in radiation therapists, oncology leadership could develop and promote solutions to reduce the influences and support occupational satisfaction and effectiveness.

Definition of Terms

Burn Out: Occupational burnout characterized as emotional exhaustion, depersonalization, and reduced professional accomplishment. (Leiter, 2014)

Compassion Fatigue: characterized by an inability to make deeper personal connection to patients. Defined as a caregivers reduced ability or interest to be empathetic. (Leiter, 2014)

MBI: Maslach Burnout Inventory; a survey tool developed by Christina Maslach in 1999 to evaluate the level of occupational burnout individuals are experiencing (Leiter, 2014).

AWL: Areas of Work life Scale; A survey tool developed by Maslach and Leiter to evaluate factors which influence the expression of burnout in a population (Leiter, 2014).

RT: Radiation therapists treat cancer and other diseases in patients by administering radiation treatments (BLS.gov, 2015)

RO: Radiation oncology is a medical specialty that involves treating cancer with radiation. Doctors who specialize in treating cancer with radiation (radiation oncologists) use radiation therapy to treat a wide variety of cancers. (Mayoclinic.org, 2016)

ASTRO: American Society of Therapeutic Radiation Oncology; offers professional guidelines to oncologist for treatment and departmental functioning, as well as quality assurance programs and regulations. (ASTRO.org, 2016)

Conclusion

This study has contributed to understanding and preventing burnout in radiation therapy. Creating supportive, rewarding and inclusive departments where therapist's ideas, experience, and education are valued could greatly improve job satisfaction. Reducing the prevalence of burnout within the field of radiation therapy could also reduce medical errors and increase patient satisfaction, as previous research has proven that an increased expression of burnout is associated with increase in errors and decrease in patient satisfaction scores (Potter, 2010). Furthermore, Akroyd (2002) indicates that high levels of burnout "costs the US 200 billion each year in absenteeism, reduced productivity, medical expenses and compensation claims" (p. 820), and therefore it is in the interest of organizations to reduce the expression of burnout in its staff.

This research has enhanced understanding of workplace stress by discovering which of

the six influences of burnout are most prevalent in this organization. This information can empower the organization to create a more engaging, supportive environment for a population of healthcare workers, namely radiation therapists, whose job is so important to those in need. As the entrepreneur Richard Branson said in 2015 “Clients don’t come first. Employees come first. If you take care of your employees, they will take care of your clients” (n.p.).

CHAPTER TWO

REVIEW OF LITERATURE

Cancer is the second leading cause of death within the United States and is the most prevalent chronic illnesses alongside heart disease, making it responsible for roughly 48% of deaths annually (Cancer.gov, 2012). With an aging population, as well as more effective cancer screening programs and treatments, the general population includes a larger living cancer population. Having nearly two decades of experience in oncology healthcare, I am acutely aware of the stress that oncology workers experience on a daily basis due serving this aging population, and continuous pressure by organizational leaders urging staff to work with increased efficiency and less resources.

Working in numerous radiation oncology departments, from large academic centers to small community centers, I have witnessed many levels of job satisfaction, departmental cohesiveness, and organizational effectiveness. Wanting to understand why so many of my colleagues were incredibly unhappy with their working conditions, however, piqued my interest towards the prevalence of job dissatisfaction within our field. Having only read of occupational burn out and compassion fatigue within oncology nursing, I began to wonder how much of this information is transferable to radiation therapists. Is this why there is such adversity to change and an inability to have compassion for their patients and coworkers?

Radiation therapists, whose primary role is direct care for the oncology patient, experience burnout on multiple levels which can affect their job satisfaction, commitment to the organization and organizational success. *The International Journal of Radiation Oncology, Biology, and Physics* published an article relating to radiation therapist burnout in the United

states and indicates “human service workers who have considerable interaction with patient problems (psychological, social, and/or physical) are potentially more subject to chronic stress that can be emotionally draining and lead to burnout” (Akroyd, 2002, p. 816). This topic is deserving of attention not only because it affects job satisfaction of the radiation therapists, but also because burnout can lead to disengagement from occupation, leading to organizational ineffectiveness and increasing medical errors. The purpose of my quantitative study is to discover which of the six influences of burnout are the most powerful in impacting burnout in radiation therapists, and how oncology leadership can manipulate workplace factors to provide a better work environment for radiation therapists.

Origins and Topic Definition of Burnout

The term staff burn out was first coined in the 1970’s by psychologist Herbert Freudenberger as a means to describe a "state of mental and physical exhaustion caused by one's professional life" (Freudenberger, Richelson, 1980, n.p.). Over time the term burnout has been used to describe many versions of exhaustion and stress within a work environment, however, evolving research suggests that burnout is very prevalent amongst service workers such as health care workers and teachers due to the high stress and emotional connections involved in their work.

In 1993 Christina Maslach and her colleagues developed the most widely used, and highly validated tool for assessing burnout called the Maslach Burnout Inventory (MBI). The development of this tool helped define burnout as “a syndrome characterized by emotional exhaustion, treating people as if they are objects (i.e., depersonalization), and loss of meaning or purpose in work” (Shanafelt, 2012, p.1235). Burnout is believed to be related to occupational factors and prolonged stressful environments, as opposed to compassion fatigue whose

contributing factors involve the perception of relationships (Sanchez-Reilly, 2013). Burnout "is a combination of negative behavioral, attitudinal and physical changes in response to work-related stress" (Leiter, 2014, p.80) and has been described as the long term response to compassion fatigue (CF). Some authors, however, believe that burnout is specifically related to work related stress, whereas CF is the result of emotional exhaustion and decreased belief of effectiveness in emotionally stressful scenario (Balch, 2011). Balch describes CF as "a state of physical or psychological distress in caregivers, which occurs as a consequence of an ongoing and snowballing process in a demanding relationship with needy individuals", and cognitively could lead to burnout or vice versa. (Balch, 2011, p.16)

Leiter, Baker, and Maslach outlined six leading aspects which influence burnout in the workplace, for which the AWL survey exists. These areas include manageable workload, sufficient authority to make decisions, rewards and recognition, a sense of community in the workplace, fairness, and a common value with the organization (Leiter, Baker and Maslach, 2014). Each of these factors can play a part into the level of burnout experienced within an organization, and can also facilitate program development to reduce stress in the workplace if the correct actions are supported by leadership.

Burnout has an inverse correlation with job satisfaction as well, leading to increased employee turnover and reduction in the employee's sense of purpose in the workplace. According to the Journal of Clinical Oncology relating to an article on US oncologists "burnout is a better predictor than depression of lower satisfaction with career choice and may be associated with both job turnover and poorer health" (Shanafelt, 2012, p. 1237). Due to the nature of the individuals seeking healthcare roles, Balch (2011) outlines that "occupational factors, such as workload, autonomy, and reward, rather than personal relationships" put workers

at greater risk of developing burnout than the act of caring for individuals in grave health.

Major Debates, Arguments, and Issues of Burnout

Within the field of radiation therapy, there are many different professionals working together towards one goal for cancer patients, including Radiation Oncologists, Medical Physicists, Medical Dosimetrists, Oncology Nurses and Certified Radiation Therapists. The professional majority within radiation oncology departments consists of radiation therapists who deliver the prescribed radiation dose to the patient on a daily basis. These professionals care for each patient to deliver very precise treatments, within a short time frame, and are expected to be continuously empathetic and altruistic. The reality is that they sometimes grieve for patients they lose, feel the brunt of disgruntled patients dealing with their own grief, juggle multiple demands from administration and physicians, and operate highly specialized equipment. In addition to managing these demands, they are expected to stay "on time" with regard to schedules, accepting new patients every fifteen minutes of the workday. When examining the expectations of these individuals both organizationally and emotionally for the cancer patients they treat each day, it is no wonder they experience burnout.

Studies on radiation therapy professionals worldwide indicate that roughly 30% of this health care population is experiencing emotional exhaustion (EE), 10% are experiencing depersonalization (DP) and 42% are reporting diminished personal accomplishment (PA) (Probst, 2012, Akroyd, 2009, Grunfeld, 2000, Hutton, 2014, and Jasperse, 2014). Because these individuals experience the three major components of burnout, it is safe to say that radiation healthcare providers are struggling with the effects of this syndrome, and therefore experiencing a greatly reduced level of job satisfaction than those without this syndrome. This syndrome draws attention to how organizations worldwide are struggling with the same hurdles.

An important component that correlates to burnout is the amount of direct patient care. Because virtually 100% of the role of a radiation therapist is to treat cancer patients, a well-known critical patient population, it would be expected that their level of burnout would be higher than others in the field of oncology. Workload is another contributing factor to burnout, and although professional organizations such as the American Society of Therapeutic Radiation Oncology (ASTRO) suggest a staffing model to support safe delivery of radiation therapy, many organizations do not implement this model, even with the increasing complexity of equipment and sophistication of treatments being offered today. Lack of implementing a safe delivery model increases the stressors of the radiation therapists (RTs) as they are expected to do much more patient delivery than 10 years ago, but still within the same staffing model. Additionally, lack of professional development opportunity adds to burnout and reduction in job satisfaction. All six influences as outlined by Maslach will be review as they relate to the role of RTs.

Wacholz (2013) indicates finding an inverse relationship between burnout and spirituality, a factor which can act as a protective resource against stress. Organizational support in professional development can has also shown positive effects in reducing burnout and increasing job satisfaction (Bakker, 2005). All efforts should be made to recognize and prevent burnout in radiation therapy as it contributes to medical errors, staff turnover and a decrease in patient satisfaction which can reduce organizational effectiveness (Leiter, 2014).

Methodology

A mixed methodology approach was used for this research. Two established and validated surveys developed by Christina Maslach and Michael Leiter, named the Maslach Burnout inventory (MBI-HSS) and the Areas of Work life (AWL) scale (Leiter, 2014), were conducted. In addition, 3 structured interviews to examine the results were conducted,

specifically with those in supervisory roles to allow for better understanding of the level of burnout experienced in the population of therapists involved and leadership's current thinking regarding burnout reduction.

Literature

Burnout, characterized as a compilation of emotional exhaustion or fatigue, depersonalization, and loss of meaning or purpose in work, can lead to loss of job satisfaction and ill health, as well as reduction to patient satisfaction and effectiveness of care (Shanafelt, 2014, Sanchez-Riley, 2013). In 2002, authors Akroyd, Caison and Adams reviewed 12,000 radiation therapists licensed with the American Registry of Radiologic Technology (ARRT) and found that they exhibited high levels of burnout with emotional exhaustion and depersonalization. Surprisingly, "41% of the respondents saw themselves as possessing high levels of professional self-esteem" (Akryod, 2002, p. 818). This finding is mirrored the study of burnout and career satisfaction of US oncologists (Shanafelt, 2012), finding that they too exhibited high levels of burnout, but still felt high levels of job satisfaction. The former study also claimed that radiation therapists exhibited high levels of burnout when compared to the professional norms, and elevated levels of burnout as compared to nurses who spend a majority of their time on direct patient care.

By using Leiter, Baker and Maslachs' review of the six leading aspects which influence burnout (Leiter, 2014) among healthcare workers as a framework for an initial review, it can be discovered which aspects have the least impact on burnout. Study findings can allow professionals to focus on the factors that can have the most impact on reducing burnout. Below is a review of the literature to support each concept.

Manageable Workload

Radiation Therapy is administered to patients through a series of treatments planned over a number of weeks or months. Traditionally, most treatments are delivered within a fifteen-minute time frame and a radiation therapist may deliver radiation to up to 60 patients per day, back to back, in these time slots. Akroyd discovered that "job-related stresses such as work load, time pressure, and role conflicts correlate more highly with burnout than with patient-related interactions" (p. 820), indicating that this tight schedule plays a large role in professional exhaustion. In addition to this, many organizations are still functioning on the minimalistic approach to staffing. The American Society of Therapeutic Radiation Oncology (ASTRO) published an article in 2012 titled *Safety is No Accident* (Zietman, 2012) outlining that proper staffing is imperative to deliver safe radiation treatments.

Workload can be better understood through determining what an acceptable workload is as well as defining what constitutes too much. National associations such as the American Society of Therapeutic Radiation Oncologists (ASTRO) has acknowledged the advances in technology for current radiation treatments as an increase in workload and have warranted a second look at the basic staffing model from the practice ten years earlier. ASTRO recommends that a minimum of one full time therapist be employed for every ninety patients treated annually, and this can increase depending on the complexity of the treatments offered from department to department (Zietman, 2012). Though this is an operational recommendation, many departments still function under the minimalistic approach of assigning one therapist to each linear accelerator, or treatment machine, sufficient to operate for radiation treatments. Therapists identify this amount as overwork for their field, often placing them in an unsafe working environment, with no relief or second check for errors.

Excessive workload due to minimal staffing also has a snowball effect into other areas of job satisfaction for RTs. Overwork minimizes opportunities for additional training, or participation on other projects within the organization which might enhance and balance the workload and highly stressful job. A study on RTs and burnout in the UK indicates "Excessive workload, lack of recognition and lack of professional development opportunities were identified as significant stressors and the presence of these organizational stressors consistently predicted higher emotional exhaustion" (Jasperse, 2014, p. 86). Jasperse's findings indicate that strategies to reduce burnout should involve job redesign, flexible work schedules and opportunities for education and goal setting.

Autonomy: Sufficient Authority to Make Decisions

Autonomy is an additionally perceived influence on occupational burnout. Having autonomy in one's professional role allows the individual to feel sufficiently empowered to make decisions that offer the best care for the patient or the best outcome for the department. Autonomy can be experienced through many means in a profession such as flexible schedules, participation in decision making, or simply feeling respected for one's experience and opinions. Research shows that medical managers who hold greater autonomy than frontline staff displayed a lower level of burnout, even though their level of stress is perceived to be higher due to their job duties (Heeb, 2014). Understanding how autonomy can affect job satisfaction and impact the level of burnout experienced is important to understanding syndrome in RTs. Heeb's article (2014) examining nurse managers in oncology indicated that although managers inevitably hold highly stressful roles, their level of burnout was rather low when surveyed using the MBI tool. The literature suggests that due to the nature of their role, having autonomy on multiple levels and a flexible schedule, their overall stress was significantly reduced, thereby reducing their risk

of burnout. This is something that most front line staff members do not have the privilege of, and therefore flexibility appears to be a major stress reliever.

The majority of radiation therapists are precise thinking and highly adaptive individuals who have the ability to be both compassionate and technically savvy, and the rigorous education that they withstand is an additional testament to their level of intelligence (ASRT, 2016). It should not be a surprise that once they are working in the field, that there will be a longing for continuous learning and autonomy within the department in which they work. The Article, *Safety is No Accident* (Zietman, 2012) published by ASTRO highly suggests that radiation therapists (RTs), being the front line staff, have the authority to make decision for process improvement and for patient safety, which would involve them in many facets of department operations. Dr. Lawrence Marks within this article suggests "an ideal open environment with a safety-minded culture only exists where staff are permitted and encouraged to suggest and lead change to improve safety, quality and efficiency" (p. 19). This suggestion would have RTs in the forefront of patient safety and operational decisions; however, this is not overwhelmingly occurring throughout the majority of radiation departments. Grunfeld (2000) also speaks to this regarding their Canadian study with burnout, outlining "global rating of high job satisfaction was most strongly associated with feeling that professional experience was being used to the fullest, having variety in the job, and deriving intellectual stimulation from work" (p. 168). This statement therefore supports that when RTs have a greater role, and feel that their experience and opinions are part of the organizational culture and decision making, it reduces the propensity of burnout and can greatly increase the experience of job satisfaction.

Authors from the *Journal of Personality and Social Psychology* suggest that autonomy is a "job resource" which can produce greater well-being and job satisfaction. A meta-analysis of

63 countries indicated that "individualism was a consistently better predictor than wealth" (Fisher, 2011, p.164) for personal well-being.

Another author, Bakker (2005) indicates that autonomy is crucial to job satisfaction as it allows for more individual resiliency. He states "greater autonomy is associated with more opportunities to cope with stressful situations" (p. 172), allowing people to feel more fulfilled and satisfied when they have the laterality to make the decisions they feel will produce the best results.

Rewards and Recognition

It is becoming widely understood in healthcare that rewards and recognition play a major part in reducing staffing turnover and increasing job satisfaction. This is another factor that affects the level of burnout staff can experience. Jasperse outlines in his 2014 study that lack of recognition is a significant contributor to burnout and increases job stress. Highly engaged employees often seek recognition to ensure that their hard work is being recognized and worthy of their efforts. Lack of recognition can cause good employees to decline in their engagement and to do only the minimum of work necessary for department function, leading to both individual and organizational stress.

Sense of Community in the Workplace

The literature supports the idea that those departments who have a strong sense of community have lower rates of burnout, signifying that social support in the organization, as well as leadership support can lead to a reduction in stress and burnout. Akroyd's article (2002) describes that social support in the workplace can reduce stress as it provides workers with additional knowledge and advice for work situations, and also allows for reassurance of one's skills and worth within a department. Similarly, the ASTRO article (Zietman, 2012, p. 19)

article suggests "empowerment is a meaningful way to provide team members with a feeling of responsibility, thereby increasing job satisfaction, raising expectations and enhancing performance." This inter-professional respect is important to RTs and can improve their relationships within the department. Leiter (2014, n.p.) also explains in his book that negative relationships at work, either through coworker bullying, or unfair treatment from a supervisor, "have deleterious effects on employees, because they threaten the resources of the individual." This same book explains that "coworker and supervisor support were related negatively to exhaustion and depersonalization, and positively to personal accomplishment" indicating that a cohesive, supportive department with good social support of its members would reduce overall stress and reduce the inclination of burn out.

Fairness

The idea of fairness relates the quality of the department supervisor, and the level of professionalism and support given to all of its members equally. We have all seen or heard the phrase 'people don't leave jobs, they leave managers', and the literature surrounding job satisfaction certainly supports this. Probst's (2009) review of job satisfaction and burnout in the UK outlines that one of the strategies for staff retention should be greater attention to the leadership within the departments and their training and capabilities. "Clinical supervisors and those in first line management positions need to have appropriate managerial and leadership training; in some cases, these skills were perceived as lacking" (p. 9). An increase in leadership development ensuring good management can reduce the relative stress within a department.

Common Values with the Organization

When staff does not share a common value with the organization, the goals and strategies of the organization can be a factor which increases work stress. This can cause a

misalignment with the leadership and the staff. Leiter (2014, n.p.) highlights the support factor in reducing burnout by indicating "coworker and supervisor support were related negatively to exhaustion and depersonalization, and positively to personal". In light of this finding, Probst (2009) indicates that "two-way" communication needs to exist between staff and management to reduce stress in the workplace.

Not only communication, but support of the staff in their personal goals should be a strategy. Professional development, or lack thereof, was a significant stressor leading to burnout, therefore, career planning was a strategy that was suggested by Probst (2009, p. 9). A strategy should include "An organizational culture that supports Continuous Professional Development; provision of infrastructure to support continual learning" in an effort to enhance personal accomplishment, and increase job satisfaction.

Preventative Factors for Burnout in Radiation Therapy

Spirituality

Burnout prevention programs within healthcare organizations often point to self-care, including exercise and mental timeouts from work and its stressors, however, some of the most compelling literature suggests that being "spiritual" has some of the greatest prevention powers for Burnout. Wachholtz's article (Wachholtz, 2013) on spirituality in Medical residents found that "having a spiritual life, and having that spirituality salient through daily experiences appear to be critical factors associated with less burnout" (p. 9), and did not point to any certain religion or practice, but the merely the idea of spirituality.

Social Support

Social support at work has been shown to be a preventative resource against Burnout. Bakker states that is protects against "pathological consequences of stressful experiences" (2005,

p. 171). This support can be in the form of supervisor support and positive relationships, or coworker support which can offset other stressful aspects by sharing with a teammate. Akroyd's (2002) article also explains this relationship with social support, where **"**Individuals who have supportive social relationships in the workplace may be able to rely on others to aid them in dealing more effectively with stressful situations." (p. 820) .Akroyd found that the simple reassurance of worth from coworkers was enough to significantly reduce workplace stress with individuals, and therefore supports the preventative affect that a social support has on the expression of burnout.

Transformational Leadership

A leadership model made mainstream by James McGregor Burns is making its way into many radiation oncology articles and fundamental textbooks, called Transformational Leadership. A theory later developed by Bernard Bass, through many publications, indicates that transformational leaders "hold positive expectations for followers, believing that they can do their best. As a result, they inspire, empower, and stimulate followers to exceed normal levels of performance" (Bass, 2008, n.p.). Due to the elevated focus on safety in radiation oncology, this theory promotes the involvement of all staff in creating a culture of safety (Washington, 2015). In order to promote and sustain this type of environment transformational leaders empower staff to question and developed procedures and protocols together for the benefit of the patient and the department. This type of leadership could reduce the expression of burnout in RTs by acknowledging opinions and experience, and allowing a certain level of autonomy with patient safety in mind. Transformational leadership, therefore, may be the kind of leadership that acts as a preventative factor in the accumulation of burnout symptoms.

Additional leadership strategies are outlined by many progressive management organizations, and as such have become part of the education to become an effective leader. The management study guide (MSG experts, 2016), describe an effective organizational leader is someone who demonstrates a *democrative /participative* leadership style. These leaders guide their staff towards a goal by motivation in addition to acknowledging skill and expertise, and welcoming suggestions for performance improvement. This same management study guide describes the organizational leader as someone "who must work as a team. He should recognize that he is part of the organization as a whole" (MSG experts, 2016, n.p.). This type of leadership would be conducive to the optimal work environment for RTs, allowing them freedom to share their ideas, and offering them reassurance of worth within the organization.

Conclusion

This research reviewed the key concepts influencing burnout in radiation therapy, and determine which of these factors are most influential to the Sharp Healthcare organization. Additionally, determining which factors are most common in Sharp's radiation oncology departments allowed more focus on strategies thought to give the greatest reduction of burnout amongst radiation therapists. These suggested changes could potentially increase RT job satisfaction to an engagement level that supports the well- being of the patients and the organization.

The literature suggests that the cause of burnout in RTs is multifocal with contributing factors from the six areas of work-life, such as workload, autonomy, social support and so on. Learning more about the preventative resources such as spirituality, as well as leadership strategies which could affect the expression of burnout are important tools organizations can utilize to maximize the effectiveness of their staff and overall employee satisfaction.

CHAPTER THREE

METHODOLOGY

Understanding the major influences of burnout in a radiation oncology department is only the first step in identifying how burnout affects the organizational effectiveness of the department. Burnout affects the practice of safe patient care, as well as job satisfaction which contributes directly to staff turnover. The first research question uncovered which Areas of Work-life (AWL) influence had the greatest impact on our therapists at Sharp, and also revealed their functional level of burnout expression. The Second research question explored the reasoning behind the expression of burnout at Sharp by reviewing the MBI report with the department leaders. By exploring the results and examining the AWL scale, leaders could then suggest organizational changes which would best support the work of their RT team.

A mixed methodology approach conducting two established and validated surveys developed by Christina Maslach named the Maslach Burnout inventory (MBI-HSS), and the Areas of Work-life scale (AWL) (Leiter, 2014), were conducted. In addition, a series of structured interviews were completed with each department's leader to offer a better understanding of the burnout results, and to provide feedback on the challenges regarding burnout reduction. The interview questions helped managers examine the results of the MBI and AWL survey results from Sharp RTs and provide suggestions for organizational changes believed to help reduce any perceived influence of burnout expression.

The purpose of my study was to discover which of the six influences of burnout were most powerful in impacting burnout in radiation therapists, and how management could manipulate workplace factors to provide a better work environment for radiation therapists.

Setting, Participants and Sample

Due to the majority of literature on occupational burnout in oncology being focused on oncology nurses or oncologists, my study focused on the level of burnout and the contributing factors for staff radiation therapists within the radiation oncology departments in the Sharp organization. Through my role as clinical lead, my leadership counterparts throughout the Sharp organization had agreed to support this research project. By giving a brief introduction of the research, and contacting the leadership of all of the radiation therapy departments within Sharp, I attempted to involve as many radiation therapists as possible to provide a valid sample for this study. The number of Sharp employed RTs is twenty.

This research focused on departments within the Sharp organization, as I am interested in directing change to improve the work environment for the staff of these departments. Sharp possesses three moderate sized radiation oncology departments, each partnered with a private practice radiation oncology group of physicians, and therefore have slight differences in their operations. Having privilege to administer the MBI and AWL surveys to the radiation therapists employed within these three departments, allowed for data collection and information which could lead to operational suggestions to improve functions in all three groups.

Radiation Therapists were invited to participate in the study through email, with links to the MBI-HSS and AWL surveys, via the Surveymonkey.com online platform. In addition, structured one on one interviews were held with radiation therapy managers and/or supervisors to gather insight on the results of our groups MBI and AWL results. During this interview, managers reviewed the results of the group and offered suggestions for organizational changes thought to be most promising to combat the major influences apparent in the results.

Data

Data was gathered through the completion of the MBI-HSS and AWL surveys through an emailed link to surveymonkey.com, which was completed by the radiation therapists in the involved departments. The MBI-HSS is the most widely used tool to assess occupational burnout in research, and is a tool which has demonstrated validity and reliability with many previous studies. Akroyd (2002) indicates "Maslach and Jackson report reliability coefficients of 0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.71 for personal accomplishment." (p.817). This tool was accompanied by five demographic questions for comparison such as gender, years of experience in the field, level of education, type of employment, and age category. A general evaluation depicting the level of burnout was established for the population of the study, and compared to the published norms. In addition, the AWL survey was conducted, which also has Cronback Alpha values ranging from .70 to .82 for reliability (Leiter, 2004). The data from this survey determined which of the six established influences on burnout were the most prevalent in the study participants, and were reviewed as a group report with the Sharp oncology managers for feedback and dialogue on the results. Feedback was then categorized for themes of suggested organizational changes believed to improve work environments, based on the survey results.

Analysis

Burnout expression for participants was established as a group and compared to national norms, as the standard for healthcare professionals. In addition, group ratings for each of the six influences was established and compared to national norms, to determine which influences are most influential within oncology as compared to other health care professionals.

Data was collected through Survey Monkey and analyzed using the SPSS software, with descriptive statistics for mean, SD, and data frequencies. This information was used to compare the Sharp data to the published national norms for Burnout. One-way ANOVA was conducted to determine the effect of the demographic information on the results. A Pearson correlation coefficient was used to determine the level of burnout in relation to the demographical determinants collected, such as age, years of experience and level of education. The results of the AWL survey were stand alone data, and were not correlated with demographic data of the participants as the aim of the survey was to simply identify the most apparent work-life influence amongst the population surveyed.

Leader interviews were conducted and transcribed. Leader feedback from the interviews on the group MBI-HSS and AWL results were organized for common themes for explanations and suggestions for improvements. From all of the collected, recommendations for organizational improvements were made for the radiation oncology departments.

Sample size

Conflicting results on the necessity of sample size for an opinion survey such as the MBI and AWL exists. Since the data was being collected from a relatively small sample size, a maximum of twenty participants, the research could have shown proportional significance based on saturation- that is, until the maximum number of participants is collected. However, more empirical estimation of sample size has been adopted for the population, assuming a maximum of twenty participants. Having a confidence level of 90%, and implementing a margin of error of 10%, our sample size would have needed to be sixteen participants out of the twenty available.

Participant Rights

Procedures to conceal the identity and maintain anonymity of the participants were put in place. Since the survey was administered through the Survey Monkey platform, the participants remained anonymous, and both the researcher and the departmental leadership had no knowledge of who participated within their individual departments, as the results were shared as a group report.

The accompanying structured survey for managers reviewed the group report and each manager were asked to acknowledge and explain the results from their perspective, and give recommendations on what might be implemented for improvement. Common suggestions were collected, and the management data was reported as a group as well, maintaining the anonymity of the individuals.

Permission to conduct research within the organization was first established which involved giving a presentation, including the intent of use of the survey tools and interviews, to Sharp Healthcare's IRB committee. The IRB approval through the University of New England was also completed before subjects were accessed.

Potential Limitations

My position and experience in radiation therapy could have caused potential limitations in the interpretation of the data. The results of the MBI-HSS and AWL, being validated tools, were reliable and have been the main focus of this study. It's results displaying which workplace factors have the foremost influence on the onset of occupational burnout were clearly displayed among the data.

Overall, involving a non-biased participant in the data collection, especially in the transcription of the manager's interviews were beneficial to reduce any bias, which is why direct

quotes were used in the data description of these interviews in the results chapter, to help the readers understand that any conclusions drawn had come from the qualitative data collected.

My position as an experienced radiation therapist and oncology leader, along with extensive educational training in organizational change and transformational leadership added knowledgeable insight to the MBI and AWL results and the suggestions of change implementation from the department leaders.

Conclusion

Surveying all of the RT's within the Sharp Radiation oncology departments who volunteer to participate provided key information to leadership on making their departments better environments to work within, and provide optimal patient care for their cancer patients. By maintaining confidentiality of the individual results and interviews, participants provided honest feedback on the types of changes necessary to create a more effective and satisfying place to work. Using the validated MBI and AWL tools as well as the structured interviews with leaders to examine the results, provided a mechanism to examine and explore which organizational changes were necessary in their departments. Sharp's mission boasts attempting to be the "best place to work in the universe" (Sharp.com, n.p.) and therefore, this type of research was integral in helping organizational leaders understand the struggles of the staff it values so much. In understanding the challenges, leaders can now be better prepared to make organizational changes towards a better work environment**.**

CHAPTER FOUR

RESULTS

The purpose of this mixed methods study was to discover which of the six areas of work-life influences are most powerful in impacting burnout in radiation therapists at Sharp Healthcare, and how oncology leadership could manipulate workplace factors to provide a better work environment for radiation therapists (RTs).

The research also examined the level of burnout exhibited by the radiation therapists at Sharp Healthcare and whether existing demographic factors had any impact on the aspects of burnout among the RTs who participated.

Analysis Method

A pool of 20 possible participants including all RTs employed full time or part time were sent an email through their work domain with an invitation to participate in this study which was to determine the level of burnout amongst the RTs at Sharp and the major work-life influences affecting burnout. The link to the MBI-HSS inventory was embedded in the first email, which contained the validated survey available through the Survey Monkey platform for ease of completion, and also contained five demographic questions, which may have had an influence on the burnout results. The second email contained a similar Survey Monkey link with access to the AWL survey a few weeks later.

The responses to the MBI-HSS were aggregated after a period of 2 weeks. The response rate was favorable (n=14), acquiring 82% of the total possible participants during this time period, which was 17 RTs. Of the 20 RTs to whom the email was sent, 3 were on administrative or medical leaves of absence, bringing the total anticipated responses to 17. Using the sample

size of 17 and a confidence level of 95% for the population, the margin of error was calculated to be 12%. This calculation assumes a normal distribution within the data.

Data was first analyzed using the MBI-HSS scoring tool to interpret a resulting group score for burnout in the three categories of Emotional Exhaustion (EE), Personal Accomplishment (PA) and Depersonalization (DP). Upon completion of the MBI-HSS surveys, data were exported in a .csv document and imported to the Statistical Package for Social Sciences (SPSS) Version 24.0. Using the SPSS software, data were analyzed using descriptive statistics and frequencies for the MBI-HSS information and demographic questions. To determine whether the demographic data had any effect on the MBI-HSS results, Chi Square tests, Pearson's correlations, and Kendall's Tau were conducted to test the null hypothesis of the non-parametric data using a 95% confidence interval. One-way ANOVA test analyzed the normally distributed data, in a parametric fashion to determine the correlations between the demographic data and the resulting MBI-HSS results, also using a 95% confidence interval for determination of significance. Post-Hoc Tukey was added to the ANOVA analyses for intergroup comparison of the MBI-HSS and demographic data. The AWL survey data was collected and analyzed using the survey scorecard accompanying the validated survey tool to interpret which work life influences were most expressed in this population.

All results from the above two surveys were presented to the oncology leadership at Sharp, expressing the level of burnout amongst RTs and comparison to national health care norms, as well as demographic factors which showed significant correlations or significance in the data analysis. The responses from the leadership interviews were collected and analyzed for common themes regarding two areas: 1) contributive factors to areas of burnout and AWL

factors, and 2) organizational suggestions which could be implemented as a systematic approach in Sharp Healthcare's three radiation oncology departments.

Presentation of Results

Study Participants

Of the 20 RTs receiving the survey link, only 17 would have had access to complete it due to 3 participants being on leave of absence. The number of participants was 14 (n=14) and of these participants, 4 were male (28.6%) and 10 (71.4%) were female. Employment status within this population included 4 part-time employees (28.6%) and 10 full time employees (71.4%). The ages of the participants were collected in two groups with 4 participants being 21-35 years old and the other 10 participants falling into the 36-50-year range, with no one responding in the other age ranges. Participants fell into only two of the 4 education groups, reflecting 35.7% of the participants with an associate degree (N=5) and the other 64.3% (n=9) with a bachelor's degree. None of the participants had completed a master's degree or doctorate level education. The years of experience ranged from 1 (n=1) participant with 20+ years, 4 (n=4) participants with 11-19 years, 7 (n=7) participants with 6-10 years and 2 (n=2) participants with 1-5 years of experience in radiation therapy.

Table 1

Participant demographic information

Demographic Categories	n = 14 (%)
Gender	
Females	10 (71.4)
Males	4 (28.6)
Age	
21-35	4 (28.6)
36-50	10 (71.4)
Type of Employment with Sharp	
Full Time	10 (71.4)
Part Time	4 (28.6)
Years of Experience in Radiation Therapy	
20+	1 (7.1)
11-19	4 (28.6)
6-10	7 (50)
1-5	2 (14.3)
Highest Level of Education Achieved	
Associate Degree	5 (35.7)
Bachelor's Degree	9 (64.3)

MBI-HSS Results

Combined results were collected from the participants and the mean response for each question in the survey was used to establish the scores for Emotional Exhaustion (EE), Personal Accomplishment (PA) and Depersonalization (DP). Mashlach and Leiter confirm a reliability coefficient of r= 0.9 for EE, r= 0.71 for PA and r= 0.79 for DP. (Akroyd, 2002). The results for the Sharp group expressed a moderate rating of 23.45 for EE, higher than the national MBI norms, which state a score of 22 for its mean. The PA score surpassed that of the MBI norms, at 40.35 (high) compared to 34.6. The scores for DP were also favorable, resulting in 3.67 (low) for Sharp RTs, compared to 8.7 for MBI norms, indicating that the study's participants are still making strong patient/ caregiver interactions, keeping the connectivity to their work and patient satisfaction. Overall, the results for the MBI-HSS assessment is favorable, however, there are

significant findings in the data which outline EE as an area of concern for many aspects of personal wellbeing and patients care.

Table 2

MBI-HSS Scoring indicating Sharp Participants and MBI Norms

Group	**EE (mean value)**	**PA(mean value)**	**DP(mean value)**
Sharp (n=14)	23.45 (Moderate)	40.35 (High)	3.67 (Low)
MBI Norms (n=11,067)	22	34.6	8.7

** MBI norms from Akroyd, 2002.*

Frequencies

According to the frequencies, some responses had more expression than others. For example, 35.7% (n=5) of the responses indicated they "feel emotionally drained from my work" a few times a month. Other frequently expressed responses included the statement "I feel used up at the end of the workday" with 35.7% (n=5) responding a few times a week. These were the two most expressed responses pertaining to EE. Responses for PA were much more uplifting, with responses to the statement "I feel I am positively influencing other people's lives through my work" "everyday" scoring 78.6 % (n=11), which was the single highest response of all questions. DP's low expression was also conveyed in the frequencies to the statement "I feel recipients blame me for their problems" responding "never" from 50% (n=7) of the participants. The lowest recorded response was the question "I don't really care what happens to some recipients" with 92.8% of the respondents indicating "never". This exhibits strong support that Sharp RTs care very deeply for the patients they treat each day. Figure 1 displays the MBI-HSS responses from the RTs surveyed, representing the range of responses exhibited for each question.

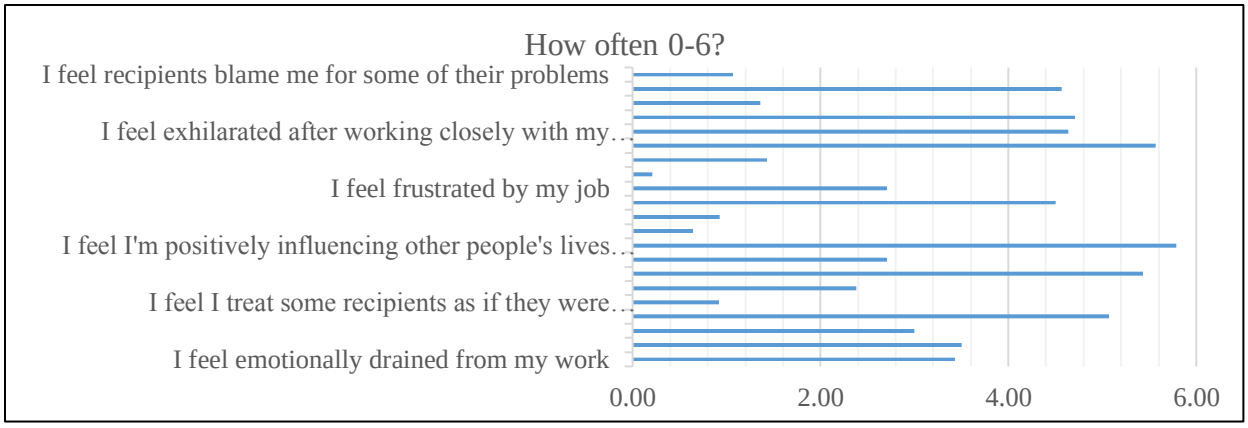

Figure 1. MBI-HSS Answer Frequencies from 0-6 (never –everyday)

Non-Parametric Correlations and Chi Square Tests

In an effort to determine whether the demographic factors affected the responses to the MBI statements, Chi squared analysis was run on the data. One of the areas where the responses were significant involved PA and years of experience. Three questions relating to PA from the MBI report expressed significance when correlated with years of experience. For example, "I can easily understand how my recipients feel about things" had a Kendall Tau significance value of ($P<0.026$). Others, including "I have accomplished many worthwhile things in this job" show a Kendall Tau significance of ($P<0.011$), supporting the 95% confidence interval. There were also significant finds correlating PA and Level of Education, where the response to the statement "I can easily understand how my recipients feel about things" showed a Kendall Tau significance value of ($P<0.002$). Similar significant findings with Kendall tau for such statements "I deal very effectively with the problems of my recipients" show significance of ($P<0.028$), indicating that level of education has an effect on the responses, which allows us to reject the null hypothesis.

The non-parametric correlations for demographic markers and EE showed significance in multiple areas. EE and Age showed a strong correlation with Kendall Tau, a significance of ($P<0.003$) was shown for the statement "I feel used up at the end of the workday", indicating that

age has a factor to play in this response. Also showing a strong Kendall Tau correlation significance was “I feel fatigued when I get up in the morning and have to face another day on the job” expressing significance (P<0.057), and Kendall Tau of (P<0.003).

Table 3

Chi-Squared Tests Showing Significance in Relation to Questions Measuring Emotional Exhaustion

	I feel emotionally drained from my work	I feel used up at the end of the workday	I feel fatigued when I get up in the morning and have to face another day on the job	Working with people directly puts too much stress on me	I feel like I'm at the end of my rope
Age					
Kendall's tau-b	0.49	-0.562	-0.548		
Asymptotic Standard Error[a]	0.152	0.143	0.131		
Approximate T[b]	2.651	-3.019	-3.019		
Approximate Significance	0.008	0.003	0.003		
Gender					
Kendall's tau-b				0.456	0.488
Asymptotic Standard Error[a]				0.208	0.146
Approximate T[b]				1.932	2.589
Approximate Significance				0.053	0.01
Type of Employment					
Kendall's tau-b		0.472			
Asymptotic Standard Error[a]		0.176			
Approximate T[b]		2.327			
Approximate Significance		0.02			
Years of Experience					
Phi	1.354				
Approximate T[b]	0.042				

Significance level set at p<.05
Note. EE questions “I feel frustrated by my job”, “I feel burned out from my work”, and “working with people all day is really a strain on me” were omitted as they did not show any significance.

Age was the only demographic parameter showing significant correlations with DP, with a Kendall Tau (P <.026). EE and Age, Gender, Type of Employment, and Years of Experience

all showed significance ranging from (P<0.020) to (P<0.057) which also supports rejecting the null hypothesis regarding the affect demographic factors have on MBI responses.

Pearson, Kendall, Spearman's Correlations

Correlations and Personal Accomplishments

Pearson's correlation was analyzed for the parametric data including all questions in the MBI survey. Questions categorizing PA indicated that the strongest correlations between responses to questions "I feel very energetic" and "I can easily create a relaxed atmosphere with my recipients" (r=.654, P<0.05, n=14), and also "I feel exhilarated after working closely with my recipients" (r=.554, P<0.05, n =14). These questions demonstrated correlation in the significance of (P<0.05). Non parametric data also showed some level of significant correlations in the Spearman's Rho analysis between questions "I can easily create a relaxed atmosphere with my recipients" and "I have accomplished many worthwhile things in this job", however, this significance showed stronger a correlation in the (P<0.01) range (r=.681, P<0.01, n=14).

Correlations and Depersonalization

Questions for DP showed no correlations in the (P<0.01) range of significance for non-parametric data using Kendall Tau, but did show (P<0.05) correlation range for questions "I feel recipients blame me for some of their problems" and "I feel this job is hardening me emotionally", (r=-.543, p<.05, n=14). Similarly, these same questions demonstrated high correlations with Spearman's rho, as well. Pearson's parametric data analysis demonstrated significant correlations in the (P<0.01) range for questions "I feel I treat some recipients as if they were impersonal objects" and "I don't really care what happens to some recipients" (r=.789, P<0.01, n=14), which suggests that those who do not care for the individual patient may truly be treating them as objects. Other correlations in the 95% (P<0.05) confidence level were pairs

questions “I worry that this job is hardening me emotionally” with “I’ve become more callous towards people since I took this job” (r=.546, P<0.05, n=14), as well as “I don’t really care what happens to some recipients” and “I feel recipients blame me for some of their problems” (r=.609, P<0.05, n=14). Their linear correlations suggest that those worried about becoming callous strongly relates with their fear of this job hardening them emotionally. Similarly, participants feeling like patients blame them for their problems may feel they are treating patients like objects.

Table 4

Pearson Correlations Showing Significance with Questions Expressing Depersonalization

		How often 0-6? - I feel I treat some recipients as if they were impersonal objects	How often 0-6? - I worry that this job is hardening me emotionally	How often 0-6? - I don't really care what happens to some recipients	How often 0-6? - I feel recipients blame me for some of their problems
How often 0-6? - I've become more callous toward people since I took this job	Pearson Corr.		.546*	.627*	
	Sig. (2-tailed)		0.043	0.016	
	N		14	14	
How often 0-6? - I don't really care what happens to some	Pearson Corr.	.789**			.609*
	Sig. (2-tailed)	0.001			0.021
	N	14			14

***Correlation is significant at the .01 level (2-Tailed)*
** is significant at the .05 level (2-Tailed)*

Correlations and Emotional Exhaustion

Pearson’s correlations of the parametric data show correlations in the majority of questions, with more than half of the significance being in the (P<0.01) range. This suggests a linear correlation with the answers of many of the EE questions, however, there were two

questions in particular that showed a higher significance to all of the other questions. The question "I feel fatigued when I get up in the morning and have to face another day on the job" showed ($P<0.01$) range of significance with all of the other questions, indicating that as this response increased in frequency, ranging from never to everyday, so did all of the others. The other highlighted question was "I feel burned out from my work" which revealed a correlation of ($P<0.01$) for all questions except "Working with people directly puts too much stress on me", which still displayed a correlation of ($P<0.05$) ($r=.615$, $P<0.05$, $n=14$). This might suggest that some participants feel that working with people is a possible buffer for burnout, where others find it contributes to their exhaustion.

Non-parametric correlations for EE demonstrate a lot of significance in the ($P<0.01$) range for many of the questions, however, the question "I feel fatigued when I get up in the morning and have to face another day on the job" had ($P<0.01$) range of correlation with all of the other questions indicating EE, suggesting that although the correlation is not linear in nature, there is some significance in the responses to this question, with all of the others.

One-Way Analysis of Variance (ANOVA)

To analyze the normally distributed data this parametric test showed correlations between the demographic factors and the responses, which may be linear. The results showed significance for all demographic factors in relation to MBI statements, except for age.

Table 5

ANOVA Results Demonstrating Significance of Demographics within Three Burnout Categories

Demographics	**EE**	**PA**	**DP**
Gender			X
Education	X		X
Employment	XXX		
Experience	XXXX	X	XX

**X signifies number of questions showing significance.*

The one-way ANOVA highlights whether the demographic factors play a significant role in the expression of EE, PA, of DP. Table 5 demonstrates the significance of education, employment and experience for EE, whereas age and gender appear to have no effect. Gender, however does shoe significance in DP, especially with the question "I feel I treat some recipients as if they were impersonal objects", showing a significance of ($p<0.004$). For the DP questions, all of the mean responses were higher for males, indicating that they tend to depersonalize more than females. The only question which showed a higher mean score for females was "I worry that this job is hardening me emotionally." This is an expected result due to the natural personality traits difference between males and females.

Education shows a slight significance for EE expression, which shows that those with a bachelor's degree have slightly lower mean responses to the EE questions on the Likert scale than those practicing with an associate degree. Questions showing significance was "I feel used up at the end of the workday" showing significance of ($P<0.021$), and demonstrating a higher response for those with an associate degree compared to a bachelor's degree. This relationship suggests that those with higher levels of education may have better coping skills to deter from EE. It is important to point out, however, that level of education had no impact on PA, meaning

that those with higher degrees are not experiencing greater accomplishments than those who have lesser degrees.

Employment also showed significant contribution to EE. Those who were employed full time, compared to part-time, recorded higher frequencies of expression for those questions contributing to EE, which aligns with literature that indicates time spent in direct patient care is a significant contributor to expression of burnout. Questions such as "I feel burned out from my work" showed the most significance ($P<0.014$), along with "I feel fatigued when I get up in the morning and have to face another day on the job" with a significance of ($P<0.017$). Again, the expression of DP, or PA has no significance on employment status, however in the category of DP the responses with higher mean scores were expressed by full time participants rather than part-time employees, which also supports the literature of time spent in direct patient care increased expression of depersonalization. For PA and type of employment there was no pattern expressed that would indicate a positive or negative correlation with type of employment to level of PA.

Years of experience demonstrate strong correlations with EE, also with some effect on DP and PA in decreasing order. There were four questions with significance in the category of EE with the highest question, showing a significance of ($P<0.01$) for the question "I feel used up at the end of the workday", showing the most indicative for those with less years of experience, and decreasing as the age groups increase. This could be related to other personal factors, such as maturity, and life experiences as age increases. DP is also significant for two questions with "I feel recipients blame me for some of their problems" showing the greatest significance ($P<0.001$). These responses were also greater for those with the least amount of experience in the field. Years of experience and PA had one significant presentation of ($P<0.009$) for the question

"I can easily understand how my recipients feel about things". Responses demonstrate a higher response for increasing years of experience. Assuming that years of experience is somewhat correlated with increasing age, again, suggests that life experiences and maturity contribute to the responses for this question.

Table 6

Example of EE question in relation to all demographic factors, showing significance

Descriptives							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
How often 0-6? - I feel used up at the end of the workday* Education	Associate Degree	5	5.00	.707	.316	4.12	5.88
	Bachelor's degree	9	2.67	1.871	.624	1.23	4.10
	Total	14	3.50	1.912	.511	2.40	4.60
How often 0-6? - I feel used up at the end of the workday *Years of Experience	1-5	2	4.50	.707	.500	-1.85	10.85
	6-10	7	4.43	1.272	.481	3.25	5.61
	11-19	4	1.00	.816	.408	-.30	2.30
	20-35	1	5.00	.	.	.	.
	Total	14	3.50	1.912	.511	2.40	4.60
How often 0-6? - I feel used up at the end of the workday* Gender	Male	4	2.75	2.062	1.031	-.53	6.03
	Female	10	3.80	1.874	.593	2.46	5.14
	Total	14	3.50	1.912	.511	2.40	4.60
How often 0-6? - I feel used up at the end of the workday* Employment	Full-time	10	4.10	1.729	.547	2.86	5.34
	Part-time	4	2.00	1.633	.816	-.60	4.60
	Total	14	3.50	1.912	.511	2.40	4.60
How often 0-6? - I feel used up at the end of the workday* Age	21-35	4	2.50	1.915	.957	-.55	5.55
	35-50	10	3.90	1.853	.586	2.57	5.23
	Total	14	3.50	1.912	.511	2.40	4.60

PostHoc Tukey Tests

Combining all data for years of experience, the PostHoc Tukey test indicates significance ($p<0.00$) for the questions "I feel like I am at the end of my rope" and "I worry this job is hardening me emotionally". This may represent the natural pattern of this type of work, where the initial years you struggle with the difficulty of the job and therefore need to adjust your

expectations versus reality. As the years of experience accumulate, as in the second question, you may feel that the job is taking too much of your energy as you look forward to retirement or career change.

Table 7

Demographic "years of experience" showing significance in two questions

Years of Experience	N	I worry that this job is hardening me emotionally P value	I feel like I'm at the end of my rope P value
1-5 years	2	.00	1.00
6-10 years	7	1.57	2.29
11-19 years	4	.50	.00
20+	1		

In conclusion of the data analysis using the MBI-HSS and the demographic information collected, it is proven that the null hypothesis can be rejected for the influence of demographics on the burnout results.

AWL Results

The AWL survey data was collected for the same group of participants as the MBI-HSS. Of the possible population of 20 RTs, 85% (n=17) completed the survey to assess the areas of work-life affecting burnout, a tool developed by Maslach and Leiter (2000). This validated survey tool is designed to measure the job-person fit for each of the 6 influences of work-life which affect job stress and ultimately burnout. The Chronbach's alpha score exceeds 0.70. The AWL survey measures include the six areas of work-life which include workload, control (autonomy), reward, community, fairness, and values. This survey tool uses a 5 point Likert scale which asks participants to rate their agreement to each comment from 1 to 5, where 1 is

strongly disagree and 5 is strongly agree. Due to the nature of some statements, reverse scoring (1=5, 2=4, etc.) was required, with the accompanying reverse values for calculations. Each score expresses congruence or incongruence with the work-life factor, corresponding to either a positive or negative job-person fit (Ganster, 2003). The scorecard metric suggested by the authors indicated a score above 3 should be perceived as a positive job-person fit, and values fewer than 3 should be perceived as a negative job-person fit. One could also describe this scale as values fewer than 3 indicate areas which influences cause greater stress, and therefore have a great bearing on the effects of burnout in the occupation. The following data analysis describes the finding for the RTs at Sharp healthcare.

Scorecard Results

The overall results of the AWL for the Sharp RTs was favorable with all areas of work-life showing a positive job-person fit, expressing a value greater than 3, as demonstrated in Graph 2. The area with the greatest job-person fit was the category of values. As explained earlier in the literature, sharing common values with the organization helps workers feel better about the work they do, creating great job satisfaction, which is a protective factor against developing burnout. These results indicate a congruence of 4.02 (out of 5) as the mean score for all respondents in this category. Questions such as "The Organization is committed to quality" and "my career goals are consistent with the organization's stated goals" scored high above the 3 value, at a mean value of 4.12 which indicates a strong congruence with these statements. The second highest scoring category was rewards. The group's mean score value was 3.85, indicating congruence and suggesting that they feel sufficiently rewarded and recognized for their hard work and effort within the organization. The question "my work is appreciated" scored the highest within this category, with a mean value of 4.13.

Two categories which fell within congruence, with mean values between 3.45 and 3.76 were control and community, respectively. Within control, the question scoring the lowest was "I have control over how I do my work" with a mean value of 3.14, however, within this same category the question "I have professional autonomy/independence in my work" scored the highest, at 3.71 for a mean value. This could be due to the nature of the RT duties of following a prescribed treatment plan as the reason these two factors have given differing results.

The category of community showed favorable results supporting the job-person fit for the role of RT. Questions such as "I feel close to my colleagues", scored a mean value of 3.94, a reverse score, but indicated a strong congruence with the statement. Other positive mean values were 4.06 for "I am a member of a supportive work group", which supports that Sharp RTs feel they work with teammates who they can rely on, trust, and lean on for support and expertise. Having a positive perception of community in the workplace has been shown to decrease the risk of burnout, as it acts as a protective factor.

Fairness scored a mean value of 3.43, which is favorably above the 3 threshold, supporting the belief that members within the Sharp RT team are all held accountable for their actions, and similarly have the same expectations of job performance. Fairness also measures whether work is distributed evenly and fairly, and the perception from this group is that this is true.

Workload expressed the lowest mean value (3.14), although it did exceed the value of 3 thresholds which determined congruence. As anticipated, workload demonstrated that it is the least congruent within the job-person fit, which can also be explained as it causes the greatest threat to burnout amongst this group. The question "I do not have time to do the work that must be done" had half of the respondents indicating that they agreed with this statement or it was

hard to decide (2-3 value), indicating that they feel pressure to meet the job demands without using additional job resources. This influence can increase the risk of burnout amongst the RTs, as their job is demanding, both physically and emotionally in nature to begin with. The lowest scoring value in this category was the question "I work intensely for long periods of time" which scored a mean value of 2.47, a value that exhibits incongruence with job-person fit. This demonstrates the affect the time constraints to deliver care, along with high acuity patients and high risks procedures, has on the perception of workload in the RT workplace, and subsequently the increased risk of burnout when exposed to this for increased periods of time. Lastly, the question "I leave my work behind when I go home at the end of the workday" also nearly fell short of the threshold, receiving a mean value of 3.0. This exposes the risk of the workplace stress affecting home life, and thereby increasing the risk of burnout in the workplace.

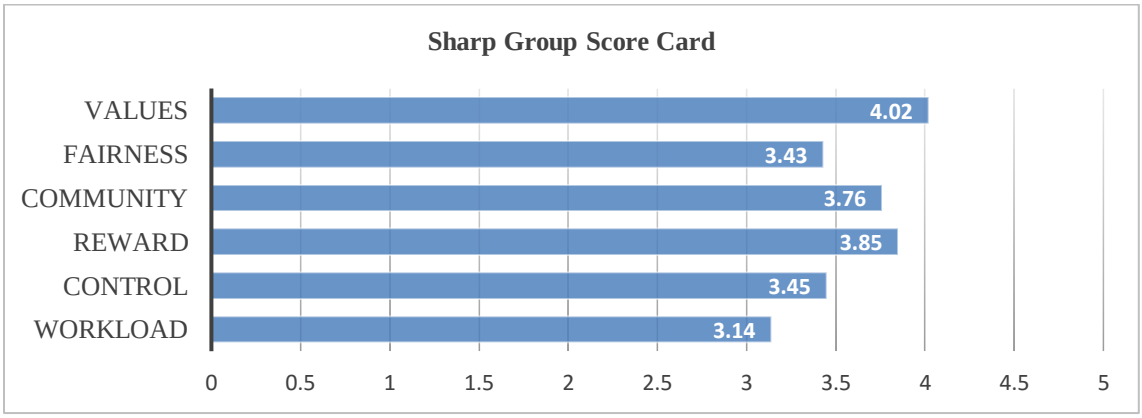

Figure 2. Answer frequencies for AWL amongst Sharp RTs

Group norms for the AWL have been published through various literature and scholarly articles, as well as the AWL Manual by Maslach and Leiter (2000). A comparison between the Sharp RT results to the national norms indicates a more favorable response from the Sharp RT data, although the sample size is much smaller. The sample size for the Sharp RTs however, supports a 95% confidence interval with a 10% margin of error, given the sample population of

20, and n=17. With this level of confidence, the data supports a strong confidence in the results for this particular group. Of interest, the Sharp RTs share a similarity with the norm in workload being the lowest scoring (least congruent) with job-person fit.

Table 8

Sharp RT results in Comparison to the National Norms for AWL

Group	Workload	Control	Reward	Community	Fairness	values
Sharp RTs (n=17)	3.14	3.45	3.85	3.76	3.43	4.02
AWL Norms (n=17,079)	2.75	3.08	3.10	3.46	2.75	3.23

* *Norm values come from the AWL manual*

In conclusion, the Sharp RTs expressed favorable results above a value of 3 for all areas, and also showed higher values for each influence as compared to the AWL norms. The data also shows that the workload influence has the greatest impact on work life and therefore has the greatest ability to influence the risk of burnout in the Sharp RTs.

Leadership Interview Data

After compiling the results of both forms of quantitative data, and adding the major findings to a PowerPoint presentation for the oncology leadership, one on one interviews were conducted with each entity's leader, or manager (n=3) with 100% participation from this participant pool. First the MBI-HSS scores were reviewed for the Sharp RTs and comparison to national norms were highlighted. Points of interest for each category for burnout were outlined, and discussed with each leader individually for consistency. The AWL data was reviewed as well, following the discussion of the MBI-HSS data.

Leaders were asked to comment on the following findings for the MBI survey. For DP,

the group score was low by scorecard value, lower than the national norms as well. The mean values for males, however, scored higher than for their female colleagues. For the PA category, results showed higher mean values for associated trained RTs than their bachelor's trained counterparts, although the overall scorecard value for the group was considered to be high, and also scoring higher than national norms. For the category of EE, the group scored a moderate to high value, and therefore had many significant findings in relation to the demographic determinants, which the leaders would find pertinent. The first was the significant findings of EE and type of employment, finding that FT employees show and increased mean value in EE, as opposed to their PT peers. The second finding shared was that EE showed an increased mean value for those with less work experience than those with increasing experience in the field. EE also showed significant correlations with education, showing those trained with an Associate Degree experience higher levels of EE than their bachelor's trained colleagues. Leaders reviewed these points and gave feedback on each, which were reviewed for common themes, or agreement amongst the Sharp oncology leadership team.

In addition to the MBH-HSS data, the results of the AWL survey were shared in a similar way. The results in all six areas of work life were shared, demonstrating that all values fell above the value 3 threshold, which shows job-person congruence. While the leadership seemed relieved that the results did not express any areas of heightened stress, the two areas that were discussed in detail where the results in the areas of workload and control. The workload result was the lowest overall score for the group, including individual questions whose results scored lower than 3, and therefore shows the most influential in affecting the workplace and subsequently overall experience of burnout. Although fairness score two points lower overall than control, control was looked at more closely as the individual questions in the category of control had

lower scores, and therefore a bigger impact on the workplace. Therefore, workload and control were the two areas discussed with the leadership as having the most potential in affecting the workplace environment. Data was reviewed for agreement and common themes among the participating leaders.

Interview Results

The leaders were asked if they were surprised by the findings for DP, having a low score through the MBI-HSS scoring. The majority response, with full agreement, was that they were not surprised, and a few comments indicated that they were relieved that this score was low. Since Sharp holds their marketed "Sharp Experience" as one where patients will always feel cared for, and not just another number, seeing that this group exhibits a deep caring connection to their patients is a positive for both the department and the Sharp healthcare organization. However, when asked if the finding that males did exhibit a higher overall score for DP than females, none of the leaders were surprised. Leader A expressed "that makes sense. Females are more personalized with their patients. Males can categorize.", and leader B stated "I wish it didn't (the data) show this. That is society's stereotype". Leader C gave the explanation that "guys are a little tougher than gals. We are more sensitive. They (males) don't have that emotional part that we do", all indicating that they were not surprised of the correlation of males expressing a higher DP than females. The two reasons they felt that were justified is that it is society's expectation that males are less emotional, and they also have a greater ability to detach emotionally and treat their tasks as part of their jobs, whereas females more often get emotionally involved.

The MBI-HSS for PA were reviewed, indicating that PA for the group had a high score, and also surpassed the national norms. Again, leaders were not surprised about this result, and

felt their RTs at Sharp hold great pride in the work they do, so the result of feeling accomplished was expected. In revealing that RTs who were associate degree trained show more expression of PA than their bachelor's degree trained peers, the group had mixed responses. Two thirds of the responses felt that was understandable, perhaps due to the fact that those with a bachelor's degree might have higher expectation of what accomplishment is, or their reality is meeting their expectations of the job. Leader B had some insight that higher degrees might mean greater variety in their work, "sometimes (when they) have a higher level of education, you might give them other tasks. They get more variety which might help with burnout", but then continued to indicate that this also depends on the RTs initiative and not necessarily level of education. The other one third expressed that they thought achieving a bachelor's degree alone would have a great impact on PA. Leader C expressed that "I would feel more professional with a BS behind my name, but at that time, those my age went into the profession on a personal level and not a professional level.", as a means to explain that many of the RTs currently hold an associate degree as opposed to a bachelor's degree.

Results for EE showed many significant factors and insights received by the leaders were poignant. Knowing that the group exhibited moderate to high scores for EE, scoring higher than national norms, leaders were not surprised overall, reiterating the rigorous nature of the therapy job, and its emotional consequences. When asked to comment on the significant correlation between EE and employment, all leaders (n=3) responses shared a common theme that those who work PT have a greater resiliency to burnout because they have more time outside of the work place, offering more time to refresh and regroup, whereas those RT's who work FT are dealing with patient issues, delays and emergencies on a daily basis which can lead to both physical and emotional exhaustion. Leader A indicated "because they are seeing these patients

every day for a period of time, unlike others who do not see them daily. They (FT RTs) develop relationships with patients," which was offered as justification that EE was more highly expressed. Leader C stated "I am not surprised, FT are working more, more hours with patient, exhausting them emotionally", and Leader B shared they were also not surprised of the result "because you (the RT) are physically exhausted and therefore emotionally (exhausted) just correlated for me, because you are taking that all on the entire time you are there".

The FT status also resulted in a higher score for DP as well, and the leaders expressed that this, again, is due to the physical exhaustion and daily activities which often force staff to "go through the motions" (Leader B), which can lead to a disconnect with personalized care. In addition to the reduced time for refreshing for FT employees, leaders also expressed that FT workers hold a greater responsibility within the workplace, for communication of changes, as well as the expectation of accommodating emergency patients and overtime hour accumulation, all leading to increased time in direct patient care. These are all items shown within the literature to increase risk of burnout, and therefore support this finding. According to Akroyd's article (2002), "Maslach (2) contends that human service workers who have considerable interaction with patient problems (psychological, social, and/or physical) are potentially more subject to chronic stress that can be emotionally draining and lead to burnout". In addition, FT employees also experience higher workload, and Akroyd concluded that "job-related stresses such as workload, time pressure, and role conflicts correlate more highly with burnout than with patient-related interactions" (Akroyd, 2002, p. 20).

The correlation between EE and those with less experience within RT having higher expression was not surprising to two thirds of the group as well (n=2). Their insight was that those who are new in the field could have greater expression of EE due to making new

adjustments into work life after college, and that they are learning to "take care of themselves" in a new job, as an adult, etc. This, in addition to the emotional and physical commitment to this job can be overwhelming. Another statement in alignment with the previous statement but having a different twist is that those with less experience are still learning how to cope with the emotional toll of caring for those with a terminal disease. Leader B surmised that less experienced RTs "haven't seen every patient scenario, so (they experience) more exhaustion from mental anguish. (When) you see those odd things more than once; your confidence builds a little."
Leader C shared that when patients return for treatment for recurrent disease those with less experience "now have to deal with that emotional feeling of seeing them (patients) decline. I think more years have learned how to cope. We are still emotionally attached to patients, but with experience, we know where they are in their illness; that the end is coming." For these reasons, the leadership was not surprised of the findings that less years of experience in RT express more EE.

The finding of increased EE for those with an associate degree as opposed to a bachelor's degree, found two thirds of the leaders feeling that this may be due to the increase in education allowing for greater coping skills or troubleshooting and utility, in addition to maturity in the field. As leader B expressed for PA as well, those with Bachelor training may be offered more variety in their work, which can be a protective factor for EE. The literature also suggests that those with more education may play a role in the efficacy of their job, which can help lower EE. An article by Diggens in the Journal of Radiotherapy, 2013 outlines "Clinicians' communication skills appear central to the task of addressing patients' emotional concerns, and RTs may receive little training in this area. It is therefore possible that RTs who lack training or confidence in this area of patient care may be at particular risk of burnout" (Diggens, 2013, n.p.).

AWL Results

The results for workload were reviewed for the group. The leaders were not surprised that workload scored the lowest on the AWL scorecard, indicating the lowest job-person congruence. While one third of the leaders felt that this score was not due to staffing issues, but instead due to the inefficiency of current processes and a need for more training, the other two thirds (n=2) felt it had to do with an inability to staff the department appropriately the majority of the time. Leader B indicated "It is difficult to adjust with add on (patients) and emergencies. (We) are trying to have staffing appropriately, but you cannot always predict. It is hard to be nimble. It is hard to have a pool of people who will come in on a moment's notice". In addition, Leader C also stated "I think at times it is low staffing, when we get extremely busy. We have per diem staff, but when you are talking about working until 4:30pm instead of 4:00 p.m., you don't call in a per diems for 30 minutes. You expect your regular staff to stay and do that, so you know that one day is fine, but a week or more is a little harder". While leaders felt they had standard staffing for predictable days, they expressed that many days they are forced to accommodate emergency oncology patients, or other special procedures which can over load their already condensed treatment schedule. In this way, the RTs are then required to work faster or longer hours to accommodate the new addition to the schedule, often elongating their day or causing them to miss a lunch break. While this is acceptable occasionally, when this last for a number of days or weeks, this burden can lead to increased frustration over workload.

The AWL score for control was also reviewed as a potentially influential factor for burnout amongst this group. While the leaders were not surprised with the result that control was a lower scoring factor, they had some great insight on why that might be. Suggestions ranged from lack of control over one's schedule which often causes conflicts with patient care, to

lack of confidence in the treatment areas leading to an inability to communicate with the physicians. Leader B explained "we all know what the outcome needs to be and how to get there, ultimately, but lack of control on how the MD wants to do things as opposed to how the RT wants to do things, and the lack of ideas on how to get the MD to accept your suggestions, to try them. Some of that can get you burned out." The leaders recognize that lack of control in this group, a group of highly organized and technical professionals, is an area where frustration can build easily, leading to increase in risk of burnout.

Suggestions for Implementation of Organizational Change

The final two questions of the leader's interviews related to how they could increase the job-person congruence in these two areas through organizational change. Unanimously, (n=3) the decisions all included involving the RTs in more departmental decisions and organizational changes. Various suggestions included involving them on more committees, providing more education through technology or through senior RT mentoring, which would increase confidence and allow more vocalization of suggestions or concerns in the patient's care. Leader A indicated that "support them (RTs) in speaking up and being comfortable with speaking up" is a key factor to giving them more control in their work, which could reduce the EE expression. Leader B offered "Rotating people through tasks, and working with more experienced therapists may help experience, gain confidence (with) how to approach and prove ideas. They (RTs) can feel they are contributing their ideas and that we are valuing their ideas".

Overall, the recognition of the RT staff being the forefront of treatment, having experience and ideas that could streamline processes and validate knowledge and experience, could have an impact on control and workload. Leader B summed up their plan to address both workload and control by vowing to "Give people new opportunities for leading changes."

In addition to more involvement in departmental processes, two thirds of leaders (n=2) felt that a greater focus on their current staff model was needed. The leaders indicated that being flexible to accommodate emergency patients and special procedure undoubtedly take a toll on the staff by increasing hours and expectations to give the patient the best care in the most efficient time frame. Leader C shared that "having that (additional) RT would be lovely! Prior to that, I would need to bring (proof) to administration, as well as provide data and proof the RTs are putting in OT, to justifying that position." By increasing the number of per diem staff that are trained and ready to help in these times of need, or by increasing the daily staffing by one RT, they agreed that this flexibility would be less burdensome to the entire staff. The challenge in this suggestion is also one of financial burden to the department as well, and therefore some thought on how to achieve this within the budgetary limits of the department will need to take place.

Summary

This research project aimed to reveal the current level of burnout the RTs at Sharp exhibited and whether the demographic factors of age, gender, employment type, years of experience and level of education impacted the expression of the Burnout categories of EE, PA, and DP. After examining the data, and uncovering the proof of significance through the use of Chi Squared tests, the null hypotheses regarding demographic factors can be rejected. The demographic information collected showed significance in a variety of tests, and play a big role in the level of burnout expressed, as well as within the specific burnout categories.

The research indicates the highest category of expression was EE in our study participant group, which is in alignment with the national norms. Three demographic areas played a significant role in Sharp's expression of EE, namely employment type (FT or PT), years of experience, and level of education. EE appears more significant for those who work full time

hours (FT). This is aligned with the research findings which indicate those who spend more hours in direct patient care have a higher risk of burnout. Years of experience plays a role in EE as well, with those with the least amount of experience demonstrating the greatest frequency of experiencing many components of EE. This may be due to a significant learning curve in addition to graduation credentials, which may burden the newly graduated RTs, and reduce their ability to handle stressful situations at work. The third demographic trait affecting EE is level of education. Significance was found to support that those with a bachelor's degree have lower mean responses to their frequencies of reporting for EE questions, which may indicate that those which bachelor's degrees over associate degrees have a greater method of coping or handling stressful and emotional situations. Demographic correlations associated with PA included gender, education and years of experience. Those with more years of experience showed greater PA, and surprisingly showed no bearing to level of education, meaning that those with bachelor's degrees did not experience greater PA than their associate degree peers. In relation to gender, females expressed greater frequency of PA in their roles than their male peers. The category of DP also showed males expressing higher frequencies of expression than females in most questions except the fear that their job is hardening them emotionally, in which females scored higher. This finding is in alignment with societal norms of males being less emotionally involved with their recipients than females.

Using the Pearson correlations as an example, there are many questions that displayed linear correlations, but the overall theme indicated that when RTs feel accomplished in their roles they in turn feel they give the best care to their patients. This is supported by the research which specifies that greater autonomy, which comes from confidence in their role, plays a strong role in job satisfaction, and therefore can have a protective role in the risk of developing burnout.

The AWL results, which was meant to highlight the areas of work life which caused RTs at sharp the most stress leading to burnout, was found to be both workload and control. Although the scorecard for this group demonstrated a score higher than 3 for all work life areas, indicating positive job-person congruence, these two areas scored below the 3 threshold in individual questions, leading the overall score to be lower than the other areas, and indicating factors within these categories which cause significant stress.

In reviewing all of the data with the leadership, the overall theme was that they were not surprised by any of the demographic correlations with burnout, nor were they surprised with workload and control being two areas of work life which indicted the greatest stressors. After discussing why these correlations existed, and pondering the processes and workflow of each of their departments individually, the leaders offered insight on why the results would be as they were. They were then asked to offer suggestions for change which might improve these various expressions of job stress, and how they would implement these changes. All leaders indicated that their first responsibly would be to include RTs in more decision making and policy adjusting within the department, and to recognize their role in the patient's care as being an important voice to be heard when establishing change. They spoke about supporting their staff in gaining confidence in their roles, and sharing their voice on various project via committees or daily treatments. Lastly, the majority of leaders opted to review their current staffing model, as recognition of the workload expressed, and evaluate whether they could relieve some stress to workers by adding more help, or having increased flexibility using more per diem staffing.

Overall, this research demonstrated that RTs at Sharp express some risk factors for burnout, especially in the EE category, and the possible areas for concern for increased risk of burnout are workload and control. Sharp's radiation oncology leaders welcomed the information

as a way to increase employee satisfaction by means of organizational change, which may increase departmental efficiency and patient satisfaction as well. Highly insightful suggestions were made for change and the processes for implementation.

CHAPTER FIVE

CONCLUSIONS

Radiation therapy is an important profession whose members deliver a life-saving dose of radiation to cancer patients, and whose technical and emotional expertise saves lives. These professionals work efficiently and maintain very rigid schedules in order to deliver treatment to their patients. The challenges of time, technology, and patient care can be taxing on radiation therapists (RTs), and there has been increasing evidence that these individuals are at a greater risk of developing occupational burnout.

Burnout is a serious consequence of working in a stressful environment for prolonged periods of time, however, burnout can impact more than just the individual worker. Maslach, Leiter and Bakker (2014) explain that this prolonged stress can lead to burnout, which is a combination "of negative behavioral, attitudinal and physical changes in response to work-related stress" (p. 80), and can lead to increased employee turnover, decreased job satisfaction, disengagement of staff, increased illness and increase in medical errors. These are very good reasons why employers should understand the level of burnout amongst their employees. The Work of Maslach and Leiter over the last number of decades have discovered 6 work-life influences that are major contributors to burnout, namely Workload, Control (autonomy), Reward, Community, Fairness, and Values with the organization (Leiter, 2014). Understanding which aspects of work-life cause the most stress and contribute to the onset of burnout is especially valuable to employers, helping them make insightful decisions on organizational change to combat that risk.

This study addressed one aspect of burnout that the literature did not address: which of

the six work-life influences have the greatest impact, specifically for radiation therapists? Such a gap in the literature means that leadership in radiation departments do not have the information they needed to design improvement for their workers. The purpose of my mixed methods study was to discover which of the six influences were most prominent in impacting burnout in radiation therapists, and how oncology leadership could manipulate workplace factors to provide a better work environment for radiation therapists. By surveying all RTs in the Sharp Healthcare organization to determine their level of burnout, the research aimed to answer two important questions which were missing from literature on the subject of burnout and RTs. Which of the six influences of burnout were most apparent for the radiation therapists at Sharp? And which workplace improvements did oncology leaders suggest might reduce the expression of burnout amongst their staff? This research gathered data from two validated surveys as well as through interviews with oncology leadership to gain answers to these questions.

Interpretation of Findings

The RTs were asked to complete one survey which would help determine their level of burnout, called the MBI-HSS, and another survey to unveil which workplace factors seemed to cause the most stress in their work environment, called the AWL.

MBI-HSS Results

The results from the MBI-HSS survey indicated that the RTs polled expressed moderate to high levels of Emotional Exhaustion (EE), a subcategory of burnout. In comparison to national norms amongst healthcare workers, the group scored higher in this category, expressing a higher level of EE which also showed correlations with many demographic factors gathered as well. For instance, EE is higher for those with the least amount of experience in the field, those with an associate degree as opposed to a bachelor's degree, and those who worked full-time (FT)

as opposed to part –time (PT). The group scored a high score for Personal Accomplishment (PA), higher than the norm, and showing higher significant correlations for those with an associate degree feeling more accomplished than those with a bachelor's degree. In the category of Depersonalization (DP), the group scored in the low range, well below the national norms, which reinforces that the Sharp RTs have not reached the level of burnout which causes them to treat people as objects, detaching from the emotional needs of the patients.

AWL Results

The results from the AWL survey articulated that all six areas of work-life scored above the value of 3 thresholds which identifies the areas as incongruent, or causing increased stress. The group also expressed higher congruent scores than the national norms of healthcare workers, which signifies that Sharp RTs seem to show a positive job-person fit in all areas. Although the mean score for all areas recorded above 3, some of the individual questions supporting each category did receive scores less than 3, which is where the interventions for organizational change may be most effective, but looking at results which fell short. The survey results in the workload category, for example, the statement "I work intensely for prolonged periods of time" scored 2.47, indicating incongruence with job-person fit. The areas of control and workload indicated the lowest scores. For this reason, these two topics were discussed, along with all of the significant correlations with the radiation oncology leaders, through structured interviews in order to determine which organizational changes might be made to reduce the work life areas stressors, and reduce the risk of burnout in the organization. For the area of control, the leaders indicated that including more RTs in departmental changes as well as policy and procedure development, would help create a more inclusive environment where RTs feel heard for their technical expertise and experience. This could improve their perception of control or autonomy

as they would have greater opportunities to voice their opinions and give more insight to the current practices within the department. To address the work-life factor of workload, the majority of the leaders indicated that they needed to review their current staffing model to ensure they are not consistently overworking their staff, due to the inconsistency of the schedule when emergent patients need treatment, or other special procedures which may not have been planned for in a regular schedule. One leader indicated that continuous efforts on training and workflow efficiency could alleviate the perception of workload stress, as treatments and processes move through the departments more smoothly. The leaders felt that by implementing and monitoring these two changes, their staff would feel a greater congruence to both areas of workload and control in the future.

Implications

Continued research in this area, especially Areas of Work-Life (AWL) and transformational leadership, could have lasting resonance on the RT population as well as the patients that are treated each day. With more focus on patient safety in radiation therapy emerging amongst each professional association, and the acknowledgement that the treatment complexity has increased the risk for error, new light has been cast on the need to revisit the standard safety policies and elevate them to current practice and techniques. In addition to staffing suggestions which provide guidance to the number of staff members needed to treat a volume and complexity of patients to combat workload, associations are also increasingly referring to some objectives of transformational leadership theory. Transformational leadership is being suggested as a means to not only reduce burnout amongst occupations, but also to increase employee engagement and retention. Transformational leaders, such as Maslach and Leiter (2014) indicate that greater involvement in decision making allows a greater degree of job

satisfaction as it gives both control and reward to the employees who participate in the process. These factors can reduce burnout, and thereby decrease workplace errors, which is of benefit to the organizations that support it. Whether leaders use a known transformational leadership style or contingency theory suggested by Northhouse (2013, n.p.), as a "best fit for the situation", leaders in healthcare are considering their leadership style now more than ever.

Professional associations recognize the need to look at individual competence as well as environmental workplace factors as a means to decrease preventable errors within the field. The culture of safety is increasingly highlighted by associations such as ASTRO, and publications such as "Safety is No Accident" (Zeitman, 2012) increasingly supports greater autonomy to individuals within our field to speak up when they see something they question, or do not fully understand. The movement to become a High Reliable Organization (HRO) also encourages the same participation and voicing concerns from employees in any part of the organization as a means to promote both patient safety, as well as boost employee satisfaction. This model goes far to indicate that a HRO eliminates professional hierarchy in support of patient safety, and retaliation for reporting a safety or compliance issue is strictly forbidden, to protect and encourage all employees to participate. The field of medicine might be one of the last to adopt transformational leadership theory, to acknowledge that all professions have important experience and contributions to a team working efficiently and effectively, due to the long standing history that the M.D. has the final say, and are "all knowing" in each situation.

However, due to the technological advancements in medicine, in addition to the sheer volume of treatments, techniques and medicines, it is not possible for one doctor to hold all of the answers, and so the reliance on the team work model has been emerging for some time.

Transformational leaders such as Quint Studer, who have offered models to optimize healthcare for many years, build on the foundation of transformational leadership theory. His insistence on engaging staff is in alignment with early works on transformational leadership theory which began with James McGregor Burn, from his 1978 book called "Leadership". Burns described transformational leadership where the leader and the followers teach each other with the intent of reaching the overarching goals together, with respect, inclusion and individuality. Quint Studer has coined this term "engagement", and it is seen in many leadership practices today. Studer expresses the importance of engaging the staff because "employees need to feel free to offer up their bright ideas and suggestions for improvement. And this isn't a ploy to make people feel important — the people who do the work often have the best solutions" (Studer, 2014, n.p.). If we adopt practices that involve them in the process development and give them some ownership in continuous improvement, we will see positive changes in our department efficiency. As John P. Kotter explains in his book on "Leading Change" (2012), the development of a vision involves many hours understanding the organization, and the choices at hand, and then making a decision. By understanding their organizations struggles, the organizational culture, and the needs of the employees, transformational leaders can address problems for the betterment of their staff, patients, and overall effectiveness of their organization.

Recommendations for Action

Based on the findings of this study, which looked at the level of burnout for RT's at Sharp, what workplace factors contribute most to this burnout, and what leadership can do to combat this, one suggestion is that the leadership team examine the workload within the organization, especially for the RT team. There are various components involved in determining workload, and it is not solely based on the number of patients treated per day, or annually.

As outlined in the ASTRO publication, "Safety is No Accident" (Zietman, 2012), workload must also take into account the complexity of the patients treated within that volume. Perhaps one organization is a community setting, which treats a palliative population with minimally advanced treatment techniques, lower radiation doses, and minimal integrative therapies such as chemotherapy. That department would require far less attention to detail, quality assurance, team coordination and focused attention than another department that may specialize in stereotactic radiosurgery of the brain and spine. With advanced techniques come greater risk to the patients, therefore the need for quality assurance becomes more rigorous, and the attention at the treatment console cannot be compromised by exhaustion. The RT is the last line of defense between a successful treatment, and a fatal error. It is imperative that this group has the optimal workflow to keep them engaged and alert, but not rushed or convoluted in any manner. Although initially the need to add more staff may be perceived by administrators to be cost prohibitive, the expense pales in comparison to the cost of a medical error or the constant turnover of dissatisfied staff.

The second suggestion emerging from this research is the need to acknowledge the expertise and technical skill of the RT. Although the leadership team made some valid suggestions including RTs in more decision making, the suggestion would be to go a step beyond that and provide more education and training. The research reveals those with an Associate Degree experience a higher degree of EE than those who are Bachelor Degree trained, and it is supported in the literature on advanced degrees that university degrees create more diversified students, capable of rationalizing and understanding complex concepts. As radiation therapy evolves, it is becoming more and more complex, and thinking that programs can teach the entire technical curriculum, in addition to critical thinking, radiation safety and self-care, as well as

address the complex emotional needs of today's cancer patient within a 2-year technical diploma is unrealistic. Radiation therapy treatment itself is difficult enough for students to grasp, as it involves learning how to think in a three-dimensional concept mapping, within the anatomy of the patient. Additionally, RTs do far more than simply treat the patient. They counsel them on treatment side effects, skin care, emotional needs, and scheduling concerns to help them continue living somewhat normal lives while they are receiving five or six weeks of treatment. RTs are technologists, but on a smaller scale they are also nurses, social workers, and administrative assistants to meet all of the needs of the patients. Encouraging as much continuing education as possible for the current staff by means of educational lectures and organizational process improvement programs like lean six sigma, and topics such as crucial conversations, could help staff contribute to more department projects and improve communications between colleagues. This may be an interim solution while feedback to the educational programs on the evolution of the professional needs and competencies should be encouraged.

Using the work of Burns, Kotter, and Studer as scaffolding to understand why competent leadership is so important, as well as educating every person in a supervisory role about the tenets of transformational leadership theory could improve this organization. Understanding the theory of transformational leadership will allow leaders to be part of the team, lead by example, in lieu of the traditional top down model of management. This will not only allow leaders to open up the lines of communication from their team regarding concerns or the needs for improvement, but could change the culture within the departments to move toward the HRO concept of team as opposed to hierarchy. By valuing each member of the department, the assumption will be higher job satisfaction, greater communication, and safer practices being implemented. These changes theoretically, should all lead to better treatment for the cancer

patient, and higher patient satisfaction scores. Increased patient satisfaction scores lead to greater reimbursements for the organization, and therefore the implementation of transformational leadership comes full circle.

Recommendations for Further Study

There appears to be many further studies which could continue to add to the findings of this study. Departments could examine their prevalence of treatment errors of near misses against the volume of patients treated, or staffing available within the department within a specific range of time to determine whether they acknowledge a trend between exhaustion and medical error with their department. A comparison might be made of level of burnout in males as opposed to females, to see if DP is a protective factor for burnout. The emotional detachment from the patient may act as a buffer for becoming too overwhelmed with their work, and perhaps males are better adapted than females for this field, inherently. Comparing the difference in burnout between this group of Sharp RTs with the burnout of other radiation oncology departments whose minimum requirement for employment is a bachelor's degree may be interesting to see if their level of EE is lower or higher. This would be important information for Sharp to evaluate whether a bachelor's degree is recommended to practice radiation therapy. In addition, it would be interesting to implement the organizational changes the Sharp leaders suggested and re-survey the same population in a year's time to see if the changes had made any difference in the outcome of burnout and AWL stressors.

In addition, further research could examine the impact that training leaders in transformational leadership tenets has made in the culture and employee engagement with the organization. This type of leadership is imperative to support the culture of safety we aim to

reach within our organizations, for both the safety of the patient, and the sustainably of the profession.

Conclusion

Radiation therapy today has become a complex profession which requires both technical competence and emotional intelligence. It is fast paced, requires attention to detail, and is both physically and mentally demanding. The intent of this research was to investigate why so many RTs seemed to be unhappy within this field, and what contributing factors were. In addition, it aimed to look at what organizations can do to increase employee engagement, satisfaction and reduce turnover.

It was found that radiation therapists at Sharp have a high degree of professional accomplishment and are still very engaged with their patients which was demonstrated by the low depersonalization scores. However, radiation therapists still have moderate to high emotional exhaustion scores, which is the major concern for the burnout score. Dreading to get up and go to work due to exhaustion from workload or other factors, decreases a person's love for their job and is concerning to the administration, as it decreases staff's ability to successfully care for their patient in a safe way. By having the leaders address the areas of concern, namely the workload and control aspects that radiation therapists demonstrated are stressors, they aim to work towards creating the best possible environment for their staff they employ.

This research was important because it allowed leadership to understand where there needs to be significant attention to induce changes in the organization. By implementing the suggestions of the leaders, and perhaps the suggestions of this research, the improvements will expand to the entire department, including other professionals within it. By assuring leadership is aware and engaged in the changes necessary to provide safe and efficient patient treatments,

and continuously searching for knowledge necessary to keep employees engaged in the goals of the department, this will inevitably create a cohesive and superior environment to be a part of.

REFERENCES

Akroyd, D., Caison, A., & Adams, R. D. (2002). Burnout in radiation therapists: The predictive value of selected stressors. *International Journal of Radiation Oncology Biology Physics*, *52*(3), 816–821. http://doi.org/10.1016/S0360-3016(01)02688-8

Anfara, V. A., & Mertz, N. T. (2006). *Theoretical frameworks in qualitative research*. Thousand Oaks, CA. SAGE Publications.

American Society for Radiation Oncology. (n.d.). Retrieved October 13, 2016, from https://www.astro.org/

Bakker, A. B., Demerouti, E., & Euwema, M. C. (2005). Job Resources Buffer the Impact of Job Demands on Burnout, *36*(2), 170–180. http://doi.org/10.1037/1076-8998.10.2.170

Balch, C. M., Shanafelt, T. D., Sloan, J., Satele, D. V, & Kuerer, H. M. (2011). Burnout and career satisfaction among surgical oncologists compared with other surgical specialties. *Annals of Surgical Oncology*, *18*(1), 16–25. http://doi.org/10.1245/s10434-010-1369-5

Barcley, T. P., Potter, P., Deshields, T., Divanbeigi, J., Berger, J., Cipriano, D., … Hill, C. (2009). Evaluation of burnout syndrome in oncology employees. *Journal of Radiotherapy in Practice*, *13*(3), 968–974. http://doi.org/10.1007/s12032-009-9318-5

Bass, B. (2008). *The Bass Handbook of Leadership*. (S. and Schauster, Ed.). New York, NY: Free Press.

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Radiation Therapists, on the Internet at http://www.bls.gov/ooh/healthcare/radiation-therapists.htm (visited March 28, 2016).

Burns, J. M. (1978). Leadership. New York: Harper & Row.

Converso, D., Loera, B., Viotti, S., & Martini, M. (2015). Do positive relations with patients play a protective role for healthcare employees? Effects of patients' gratitude and support on nurses' burnout. *Frontiers in Psychology*, *6*(April), 470. http://doi.org/10.3389/fpsyg.2015.00470

Demirci, S., Yildirim, Y. K., Ozsaran, Z., Uslu, R., Yalman, D., & Aras, A. B. (2010). Evaluation of burnout syndrome in oncology employees. *Medical Oncology*, *27*(3), 968–974. http://doi.org/10.1007/s12032-009-9318-5

Diggens, J., & Chesson, T. (2013). Do factors of emotion-focussed patient care and communication impact job stress, satisfaction and burnout in radiation therapists? *Journal of Radiotherapy in Practice*, *13*(1), 4–17. http://doi.org/10.1017/S146039691300006X

Doolittle, Benjamin R.. *Psychology of Burnout* : New Research. Hauppauge, NY, USA: Nova Science Publishers, Inc., 2013. ProQuest ebrary. Web. 8 November 2015.

Dungey, G., & Jasperse, M. (n.d.). Investigating Stress, Burnout and Job Satisfaction within New Zealand Radiation Therapy Departments, 563.

Fischer, R., & Boer, D. (2011). What Is More Important for National Well-Being : Money or Autonomy ? A Meta-Analysis of Well-Being , Burnout , and Anxiety Across 63 Societies, *101*(1), 164–184. http://doi.org/10.1037/a0023663

Freudenberger, H. J., & Richelson, G. (1980). Burn-out: The high cost of high achievement. Garden City, NY: Anchor Press.

Ganster, D. C. P., & , P. (2003). Emotional and Physiological Processes and Intervention Strategies, Volume 3. : Emerald Group Publishing Limited. Retrieved from http://www.ebrary.com.une.idm.oclc.org

Gascón, S., Leiter, M. P., Stright, N., Santed, M. a, Montero-Marín, J., Andrés, E., … García-Campayo, J. (2013). A factor confirmation and convergent validity of the "areas of worklife scale" (AWS) to Spanish translation. *Health and Quality of Life Outcomes*, *11*, 63. http://doi.org/10.1186/1477-7525-11-63

Gillies, C., Bristow, B., Gallant, F., Osmar, K., Lange-Mechlen, I., & Tran, W. T. (2014). Results of a Canadian study examining the prevalence and potential for developing compassion fatigue and burnout in radiation therapists. *Journal of Radiotherapy in Practice*, *13*(4), 383–392. http://doi.org/10.1017/S1460396914000144

Grunfeld, E., Whelan, T. J., Zitzelsberger, L., Willan, a R., Montesanto, B., & Evans, W. K. (2000). Cancer care workers in Ontario: prevalence of burnout, job stress and job satisfaction. *CMAJ : Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne*, *163*(2), 166–169.

Hansen, V., & Girgis, A. (2010). Can a single question effectively screen for burnout in Australian cancer care workers? *BMC Health Services Research*, *10*(1), 341. http://doi.org/10.1186/1472-6963-10-341

Heeb, J., & Haberey-Knuessi, V. (2014). Health professionals facing burnout: what do we know about nursing managers ? *Nursing Research and Practice*, *2014*, 7. http://doi.org/10.1155/2014/681814

Hutton, D., Beardmore, C., Patel, I., Massey, J., Wong, H., & Probst, H. (2014). Audit of the job satisfaction levels of the UK radiography and physics workforce in UK radiotherapy

centres 2012. *The British Journal of Radiology*, *87*(1039), 20130742. http://doi.org/10.1259/bjr.20130742

Imai, H. (2004). Burnout and work environments of public health nurses involved in mental health care. *Occupational and Environmental Medicine*, *61*(9), 764–768. http://doi.org/10.1136/oem.2003.009134

Jasperse, M., Herst, P., & Dungey, G. (2014). Evaluating stress, burnout and job satisfaction in New Zealand radiation oncology departments. *European Journal of Cancer Care*, *23*(1), 82–8. http://doi.org/10.1111/ecc.12098

Khamisa, N., Peltzer, K., & Oldenburg, B. (2013). Burnout in relation to specific contributing factors and health outcomes among nurses: A systematic review. *International Journal of Environmental Research and Public Health*, *10*(6), 2214–2240. http://doi.org/10.3390/ijerph10062214

Kotter, J. P. (2012). *Leading change*. Boston, MA: Harvard Business Review Press.

Leiter, Michael P., Bakker, Arnold B., and Maslach, Christina, E. (2014). Burnout at Work : A Psychological Perspective. Copyright © 2014. Psychology Press. All rights reserved., (December).

Leiter, M. P., Maslach, C., Marks, L. B., Jackson, M., Xie, L., Chang, S. X., … Adams, R. D. (2004). Areas of Worklife: a Structured Approach To Organizational Predictors of Job Burnout. *Practical Radiation Oncology*, *3*(1), 91–134. http://doi.org/10.1016/j.prro.2010.10.001

Marks, L. B., Jackson, M., Xie, L., Chang, S. X., Burkhardt, K. D., Mazur, L., … Adams, R. D. (2016). The challenge of maximizing safety in radiation oncology. *Practical Radiation Oncology*, *1*(1), 2–14. JOUR. http://doi.org/10.1016/j.prro.2010.10.001

Maslach, C., & Leiter, M. P. (2008). Early Predictors of Job Burnout and Engagement. *Journal of Applied Psychology, 93*(3), 498–512. http://doi.org/10.1037/0021-9010.93.3.498

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job Burnout. *Control*, 397–422. http://doi.org/10.1146/annurev.psych.52.1.397

Mission, Vision and Values. (n.d.). Retrieved October 13, 2016, from http://www.sharp.com/

MSG Management Study Guide. (n.d.). Retrieved April 16, 2016, from http://managementstudyguide.com/organizational-leadership.htm

Comprehensive Cancer Information. (n.d.). Retrieved October 13, 2016, from http://www.cancer.gov/

Northouse, P. G. (2015). *Leadership: Theory and Practice*. (M. Starly, Ed.) (7 th). thousand Oaks, CA.

Occupational Burnout. (2015, October 16). Retrieved November 23, 2015, from https://en.wikipedia.org/wiki/Occupational_burnout.

Potter, P., Deshields, T., Divanbeigi, J., Berger, J., Cipriano, D., Norris, L., … Olsen, S. (2010). Compassion fatigue and burnout. *Clinical Journal of Oncology Nursing*, *14*(5), E56-62. http://doi.org/10.1188/10.CJON.E56-E62

Probst, H., Griffiths, S., Adams, R., & Hill, C. (2012). Burnout in therapy radiographers in the UK. *British Journal of Radiology*, *85*(1017), 760–765. http://doi.org/10.1259/bjr/16840236

Probst, H., & Griffiths, S. (2009). Job satisfaction of therapy radiographers in the UK: Results of a phase I qualitative study. *Radiography*, *15*(2), 146–157. http://doi.org/10.1016/j.radi.2008.02.003

Radiation Therapist. (n.d.). Retrieved April 10, 2016, from https://www.arrt.org/Certification/Radiation-Therapist

Radiation Oncology. (2016, January). Retrieved March 28, 2016, from http://www.mayoclinic.org/departments-centers/radiation-oncology/overview

Ravitch, S., & Riggan, M. (2012). Introduction. In Reason & rigor: How conceptual frameworks guide research. Thousand Oaks, California: Sage Publications.

Sanchez-Reilly, S., Morrison, L. J., Carey, E., Bernacki, R., O'Neill, L., Kapo, J., … Thomas, J. deLima. (2013). Caring for oneself to care for others: physicians and their self-care. *The Journal of Supportive Oncology*, *11*(2), 75–81. http://doi.org/10.12788/j.suponc.0003

Sehlen, S., Vordermark, D., Schäfer, C., Herschbach, P., Bayerl, A., Pigorsch, S., … Geinitz, H. (2009). Job stress and job satisfaction of physicians, radiographers, nurses and physicists working in radiotherapy: a multicenter analysis by the DEGRO Quality of Life Work Group. *Radiation Oncology*, *4*(1), 6. http://doi.org/10.1186/1748-717X-4-6

Shanafelt, T., & Dyrbye, L. (2012). Oncologist burnout: causes, consequences, and responses. *J Clin Oncol*, *30*(11), 1235–1241. http://doi.org/10.1200/JCO.2011.39.7380

Sherman, A. C., Edwards, D., Simonton, S., & Mehta, P. (2006). Caregiver stress and burnout in an oncology unit. *Palliative & Supportive Care*, *4*(1), 65–80. http://doi.org/10.1017/S1478951506060081

Studer, Founder of Studer Group, Q. (2014, March 31). 10 Free (Or Very Inexpensive) Ways To Engage Staff. Retrieved October 09, 2016, from http://www.beckershospitalreview.com/hospital-management-administration/10-free-or-very-inexpensive-ways-to-engage-staff.html

Swafford, L. G., & Legg, J. S. (2009). Determinants of job satisfaction among radiation therapy faculty. *Journal of Allied Health*, *38*(3), 163–9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/19753428

Surveillance, Epidemiology, and End Results Program. (2012). Retrieved December 13, 2015, from http://seer.cancer.gov/statfacts/html/all.html

van Mol, M. M. C., Kompanje, E. J. O., Benoit, D. D., Bakker, J., & Nijkamp, M. D. (2015). The Prevalence of Compassion Fatigue and Burnout among Healthcare Professionals in Intensive Care Units: A Systematic Review. *Plos One*, *10*(8), e0136955. http://doi.org/10.1371/journal.pone.0136955

Wachholtz, A., & Rogoff, M. (2013). The relationship between spirituality and burnout among medical students, *18*(9), 1199–1216. http://doi.org/10.1016/j.micinf.2011.07.011.Innate

Washington, C. M., & Leaver, D. T. (2015). Principles and practice of radiation therapy. St. Louis, MO: Mosby Elsevier. A Culture of Safety

Zeitman, A. (2012). American Society for Radiation Oncology. Retrieved October 13, 2016, from https://www.astro.org/ Safety is No Accident

APPENDIX A.

MBI-HSS SURVEY INSTRUMENT

Maslach Burnout Inventory™

Instruments and Scoring Guides

Forms: General, Human Services, & Educators

Christina Maslach
Susan E. Jackson
Michael P. Leiter
Wilmar B. Schaufeli
Richard L. Schwab

Published by Mind Garden

info@mindgarden.com
www.mindgarden.com

APPENDIX B.

AWL SURVEY INSTRUMENT

Areas of Worklife Survey

by Michael P. Leiter & Christina Maslach

Published by Mind Garden, Inc.
www.mindgarden.com

APPENDIX C.

DEMOGRAPHIC INFORMATION

2. Type of employment with Sharp:

- ◯ Full Time
- ◯ Part Time

3. Sex:

- ◯ Male
- ◯ Female

4. Years of experience in Radiation Therapy

- ◯ 1-5
- ◯ 6-10
- ◯ 11-19
- ◯ 20+

5. Your age is:

- ◯ 21-35
- ◯ 36-50
- ◯ 51-70
- ◯ 70+

6. Highest level of education achieved?

- ◯ Certificate/Diploma
- ◯ Associate's degree
- ◯ Bachelors degree
- ◯ Masters degree
- ◯ Doctorate degree

APPROVED
By Sharp HealthCare Institutional Review Board at 1:49 pm, May 25, 2016

APPENDIX D.

LEADER INTERVIEW

Sharp HealthCare Institutional Review Board
APPROVED
25May2016

Managers interview with group results

1. After reviewing the scores for BO apparent amongst the RTT staff at Sharp, are you surprised with their comparison with the healthcare norms? Why or why not?
2. What are your thoughts on the correlations of BO with the demographic information collected?
3. Reviewing the 6 areas of worklife influences, are you surprised to see which category resulted as most influential in affecting BO amongst Sharp RTT's? Please explain.
4. After reviewing all results, what suggestions do you have which might have the greatest impact in reducing expression of BO in our departments? Please explain.
5. Please elaborate on all changes you plan to initiate and how you plan on executing the changes.

APPENDIX E.

CONSENT

Study Title: Burnout in Radiation Therapy: Examining the Six Leading Influences

Dear Radiation Therapist,

You are being asked to participate in research study. This study is being conducted by Gina Passmore, MS, RT(T). The purpose of my study is to discover which of the six influences are most powerful in impacting burnout in radiation therapists, and how oncology leadership can manipulate workplace factors to provide a better work environment for radiation therapists.

Approximately 20 Radiation Therapists within the Sharp Organization will take part in this study.

Your participation in this study involves completion of the Maslach Burnout Inventory for Health Services workers (MBI-HSS) one time. Your participation is expected to last approximately 15 minutes.

Risks associated with your participation are minimal. Your survey answers will be anonymous. You may feel uncomfortable when answering some of the questions on the survey. Your individual responses will not be shared with anyone at Sharp other than the investigators. Your individual responses will be aggregated with all other participants in the study. The aggregate data will be analyzed and results will be shared with oncology leadership of the various departments involved, and final results will be shared with the participants. These results, as part of my doctoral research project, will also be shared with my dissertation committee members and other members of the University of New England faculty and student population. Representatives of the Sharp HealthCare Institutional Review Board (IRB) may review the study at any time (including your individual responses) to assure that the study is being carried out appropriately.

There may be no direct benefit to you from your participation in this study. Information learned from analysis of the data obtained during this study may benefit Sharp patients or Sharp employees in the future.

If you wish to participate, your completion of the MBI via http://www.surveymonkey.com/r/AssessingBurnoutRadiationTherapy, will indicate that you have read this consent, have had a chance to ask questions, and that you consent to participate. Your participation in this study is voluntary, and if you do not wish to participate, you do not need to do anything further. There will be no penalty or loss of benefits to which you are entitled if at any time you choose not to participate.

If you have any questions, concerns, or complaints at any time, please feel free to contact Gina Passmore at gina.passmore@sharp.com or (858) 939-5053. If you have any questions, concerns, complaints, or questions about your rights as a participant in research you may contact the Sharp HealthCare IRB at 858-939-7195.

Thank you for your consideration.

IRB #1605804
Rev. 24May2016

APPENDIX F.

INSTITUTIONAL REVIEW BOARD- SHARP HEALTHCARE

1605804
Passmore
06/15/2016

Institutional Review Board
7930 Frost Street, Suite 300
San Diego, CA 92123
Phone 858-939-7195 / Fax 858-939-5067
http://sharpnet/irb/ / www.sharp.com/research
Email: research@sharp.com

May 25, 2016

Gina Passmore, MS, RT(T)
Radiation Oncology
3075 Health Center Dr.
San Diego, CA 92123

RE: IRB # 1605804 / RT Burnout
Burn Out in Radiation Therapy: Examining the Six Leading Influences

The Sharp HealthCare Institutional Review Board (IRB00000920; FWA00000084) has reviewed and approved your application for the above-referenced research activity in accordance with 45 CFR 46.110, Category 7. This approval includes:

- Protocol (Rev24May2016)
- Consent Letter (Rev24May2016)
- Alteration of informed consent allowed per 45 CFR 46.116(d)(1-4)
- Waiver of written (signed) informed consent allowed per 45 CFR 46.117(c)(1-2)
- MBI-Human Services Survey (MBI-HSS) ((c) 1991)
- Demographic Questions for Research (Rev20May2016)
- Management Interview (20May2016)

This action will be reported to all committee members at the 06/15/2016 meeting.

The following site(s) and site personnel are approved:

Site(s):
Chula Vista
Grossmont
Memorial

Site Personnel:
Gina Passmore MS, RT(T), Principal Investigator

The IRB reference number is 1605804 Passmore. Please include this reference number in all future correspondence to the IRB relative to this research activity.

As a reminder, it is the responsibility of the Principal Investigator to submit periodic status reports to the IRB. Periodic review of this research activity may be conducted via an expedited process.

Approval for this research activity will expire if periodic review is not conducted before 05/24/2017. Please provide a completed Continuation Request form with required supporting documentation via IRBANA no later than 05/04/2017 to ensure timely review and continuation of this research activity.

Changes or amendments to the research activity protocol, informed consent documents, and to other research activity-related documents, as well as new documents, tools or advertisements to be utilized as part of this research activity, must be reviewed and approved by the IRB before changes are implemented.

It is the policy of Sharp HealthCare IRB that the Principal Investigator(s) submit a copy of their reports, findings, manuscripts, abstracts, articles, presentations, etc., to the IRB prior to publication. Sharp HealthCare would expect that if the results of the research project came to publication, their role would be properly recognized in the research or have the opportunity to have the organization name withheld. This also gives the organization the opportunity to prevent disclosure of data or information that is beyond the scope of the research agreement.

Please contact the IRB Office at 858-939-7199 or 858-939-7195 if you have any questions.

Sincerely,
Caryn Burgess, CIP
IRB Specialist

APPENDIX G.

INSTITUTIONAL REVIEW BOARD- UNIVERSITY OF NEW ENGLAND

UNIVERSITY OF NEW ENGLAND

Institutional Review Board
Olgun Guvench, Chair

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207)602-2244 T
(207)602-5905 F

Portland Campus
716 Stevens Avenue
Portland, ME 04103

To: Gina Passmore

Cc: Carol Holmquist

From: Olgun Guvench, M.D., Ph.D.

Date: June 6, 2016

Re: IRB Protocol Approval: Initial

Project # & Title: 060616-003, Burnout in Radiation Therapy: Examining the Six Leading Influences

The Institutional Review Board (IRB) for the Protection of Human Subjects in Research has received and reviewed the materials you submitted in connection with the above referenced study including the requested revisions. Your study has been approved by the UNE IRB after expedited review. This study is a not greater than minimal risk study.

If you wish to change your protocol at any time, you must first submit the changes to the IRB and receive its written, unconditional approval before implementing them. This includes any changes to the version of the consent forms approved by the UNE IRB. If the subjects of your study are exposed to any unusual or unanticipated risk or injury as a consequence of participating in it, you must report such events to the IRB within one working day of the occurrence.

Approval for this study expires on the date indicated below. If you need to continue your research project beyond that date, please submit a formal request (as outlined on the IRB website) at least 60 days prior to the expiration date. Please notify the IRB if you terminate the study before completing it, or upon concluding it.

The IRB wishes you well with your research. Please contact the IRB (IRB@une.edu) with any questions.

Sincerely,

Olgun Guvench, M.D., Ph.D.
IRB Chair

IRB#: 060616-003
Submission Date: June 6, 2016
Review: Expedited
Approved 45 CFR 46.110(b)(1), 63 FR 60366 (f)(7)

Status Date: June 6, 2016
Proposal Expiration Date: June 5, 2017

APPENDIX H.

INSTITUTIONAL REVIEW BOARD AMENDMENT

UNIVERSITY OF NEW ENGLAND

Institutional Review Board
Olgun Guvench, Chair

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207)602-2244 T
(207)602-5905 F

Portland Campus
716 Stevens Avenue
Portland, ME 04103

To: Gina Passmore

Cc: Carol Holmquist

From: Olgun Guvench

Date: August 26, 2016

Re: IRB Protocol Approval: PAF #1

Project # &Title: 060616-003, Burnout in Radiation Therapy: Examining the Six Leading Influences

The Institutional Review Board (IRB) for the Protection of Human Subjects in Research has received and reviewed the amendment materials you submitted in connection with the above referenced study. Based on a review of these materials the UNE IRB has approved the amendments. These changes do not pose greater than minimal risk to participants.

If you wish to change your protocol at any time, you must first submit the changes to the IRB and receive its written, unconditional approval before implementing them. This includes any changes to the version of the consent forms approved by the UNE IRB. If the subjects of your study are exposed to any unusual or unanticipated risk or injury as a consequence of participating in it, you must report such events to the IRB within one working day of the occurrence.

Approval for this study expires on the date indicated below. If you need to continue your research project beyond that date, please submit a formal request (as outlined on the IRB website) at least 60 days prior to the expiration date. Please notify the IRB if you terminate the study before completing it, or upon concluding it.

The IRB wishes you well with your research. Please contact the IRB (IRB@une.edu) with any questions.

Sincerely,

Olgun Guvench, M.D., Ph.D.
IRB Chair

IRB#: 060616-003
Submission Date: August 16, 2016
PAF Review Level: Expedited
Status: Approved 45 CFR 46.110(b)(1), 63 FR 60366 (f)(7)

Status Date (PAF #1): August 26, 2016
Proposal Expiration Date: June 5, 2017