

LATENT PROFILES OF PSYCHOLOGICAL WELL BEING AMONG CANCER
SURVIVORS: ASSOCIATIONS WITH INDIVIDUAL AND SEXUAL HEALTH
CHARACTERISTICS

BY

ASHLEIGH E. JONES

DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Community Health
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2019

Urbana, Illinois

Doctoral Committee:

Professor David R. Strauser, Chair
Professor Reginald Alston
Assistant Professor Chung-Yi Chiu
Assistant Professor Alex Wong, Washington University

ABSTRACT

A central component of a person's well-being that is significantly impacted by cancer and its treatments is sexual health. To improve the quality of life after cancer, efforts that embrace a sex-positive view and that are representative of survivor's needs and experiences are incumbent. One approach to help improve the sexual health needs of survivors is to understand the characteristics of survivors who are flourishing (i.e., doing well psychologically). Using the Mid-life in the United States (MIDUS) data, this study examined sexual health characteristics (e.g., sexual pleasure, sexual discomfort, level of intimacy) among a sample of cancer survivors grouped by individual patterns of psychological well-being (i.e., Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, Self-Acceptance) and examined demographic and sexual health factors that differentiate the groups. Four profiles of PWB were identified and include the *High* (29.5%) profile that had the highest rates of PWB; the *High-Moderate* (36%) that had the second highest rates of PWB; the *Low-Moderate* (22.5%) that had low rates of PWB; and the *Low* (12%) profile that had the lowest rates of PWB. Findings indicated that individuals in the higher well-being profile reported higher levels of sexual pleasure, emotional intimacy, and lower pain and discomfort. We found that sexual pleasure and intimacy are key aspects to consider when understanding PWB of cancer survivors. As such, one approach to improve cancer survivors PWB is to focus on enhancing individual levels of sexual pleasure, emotional intimacy and ways to reduce pain or discomfort. The current study underscores the importance of sexual health in relation to psychological well-being (PWB) among cancer survivors. Incorporating sexual health treatments among patients with chronic illness is needed to help improve patient PWB and overall quality of life.

Keywords: Cancer survivors; Psychological well-being; Sexual health.

This is for my mom who has taught me more than she'll ever know. And for my wonderful partner in life Joey who has been there for me every step of the way. I finally finished!

ACKNOWLEDGEMENTS

I would like to express appreciation to all the professors, staff members, and colleagues who I have worked with during my time as a doctoral student. I would like to offer a special thanks to my dissertation committee for their ongoing guidance and support. I am grateful for the privilege to have worked with them and thank them for helping me develop into the scholar I am today.

Thank you to all my family and friends who supported me throughout this process. A special thank you to my late father the first Dr. Jones, who I promised that I'd either be a doctor or a princess. I owe my deepest gratitude to my mother. Words cannot express the appreciation I have for all that she has done for me, her unconditional love and unwavering belief in me. Love you to the moon and back!

And last but certainly not least, to my partner in life/crime Joey, without your love, encouragement and support I may have given up a long time ago. Thanks for believing in me when I had doubts, thanks for supporting me when I had none, and thanks for all the coffee, food and love you have given me throughout this process. I am forever grateful.

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CHAPTER 1: INTRODUCTION

Cancer is a scary pestilence that cannot only end a person's life but can affect the long-term functioning and life satisfaction of survivors. Cancer directly impacts the life of individuals as well as the well-being of family, friends, loved ones, and anyone in contact with the individual (Glajchen, 2004; Northouse, 2005; Shell & Kirsch, 2001). Cancer affects the lives of people globally at staggering rates with 8.2 million cancer related deaths per year, with more than 60% of the world's new annual cases occurring in Africa, Asia, and Central and South America (Stewart & Wild, 2017). The number of new cancer related cases is expected to rise by 70% over the next two decades, with a projected estimate of 1.7 million new cases in the United States (National Cancer Institute (NCI), 2016; Stewart & Wild, 2017). However, advances in treatments are increasing survival rates exponentially making cancer no longer the death sentence it once was.

With increased survival rates cancer does not end with the disease. Being treated or cured is merely the beginning as long-term health impacts can persist well into the future (Gotay, & Muraoka, 1998; Yabroff, et al., 2007). Long-term effects can stem from several factors including type of treatment, type of cancer, age of diagnosis, sex differences, or a combination of these factors, all which can impact the differential survivorship of individuals (Hawkins, & Stevens, 1996; Hobbie, Ruccione, Moore, & Truesdaell, 1993; Hudson et al., 2003; Maunsell, Pogany, Barrera, Shaw, & Speechley, 2006; Ness et al., 2005; Schwartz, Hobbie, Constine, Truesdell, Constine, & Clark, 1994). In 2014, the number of people living beyond a cancer diagnosis was approximately 14.5 million and is expected to rise to nearly 19 million by 2024 (NCI, 2016). Cancer affects long term physical, cognitive, social, emotional, and sexual health thereby impacting an individual's well-being and quality of life.

Cancer has been thought of as a frightening time in a person's life where not only the body is susceptible to adverse changes but the mind and spirit as well. Typically, cancer research focuses on negative outcomes like dysfunction (Sadovsky et al., 2010; Schover et al., 2014; Stein, Syrjala, & Andrykowski, 2008), however, in a time where health is not merely the absence of disease a more complete picture of survivorship is needed. Although several studies advance health outcomes by focusing on adverse and negative effects of medical diseases and emotional disorders, using a positive health perspective to examine well-being among cancer survivors can help improve the quality of life and personal satisfaction for these individuals. Rather than alleviating disorders or dysfunctions, positive health perspectives emphasize helping individuals to improve themselves to enhance their life satisfaction, so they may "flourish" physically and psychologically (Ryff & Singer, 1998).

Psychological well-being (PWB) is a multidimensional model consisting of 6 dimensions of positive psychological functioning (Ryff, 1989). Several theoretical perspectives were incorporated in the conceptualization of PWB. These perspectives include: Allport's (1961) conception of maturity, Erikson's (1959) psychosocial developmental perspective, Jahoda's (1958) positive criteria of mental health, Jung's (1933) formulation of the individuation, Maslow's (1968) conception of self-actualization, and Rogers' (1961) view of the fully functioning person. These theory-based indicators are consistent with a eudaimonic perspective of happiness and are made up of six components that include autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff, 1989). Prior research has linked PWB with a range of health outcomes, including cardiovascular risk (Boehm & Kubzansky, 2012), inflammation (Friedman et al., 2007; Morozink et al., 2010), and sleep quality (Friedman, 2011; Friedman et al., 2005). While there has been debate on whether

objective or subjective well-being (i.e., happiness) better captures what it means to be “well,” several studies have demonstrated that Ryff’s measure of PWB not only encompasses a better understanding of well-being but also offers a more comprehensive representation of what well-being entails (Ryff, 2014). Although pleasant emotions such as happiness are ideal, it is not the ultimate goal but a byproduct of having a higher purpose, growth, and quality ties to others. These are the examples of well-being that are significant factors in keeping a person healthy even during challenging times (Mill, 1873/1989; Ryff & Singer, 2008) such as surviving cancer.

From a positive health perspective, a greater understanding of the multifaceted dimensions of a person’s quality of life should be considered regarding survivorship. One dimension that is central to well-being and can be significantly impacted by cancer and its treatments is a person’s sexual health. Physiological, psychological, and social dimensions of sexuality can be impacted by cancer and alteration of sexuality at all dimensions is possible. For example, side effects of treatment may affect sexual health, which can adversely impact intimate relationships with romantic partners thereby impacting one’s well-being. In addition, cancer can impact all areas of sexuality both positively (e.g., closeness with partner, appreciation for self/body image) and negatively (e.g., fertility issues, lack of drive, poorer body image; Dizon, Suzin, McIlvenna, 2014; Gilbert, Ussher, & Perz, 2010; Stein et al., 2008; Williamson, Harcourt, Halliwell, Frith, & Wallace, 2010; Wright, Coad, Morgan, Stark, & Cable, 2014).

Sexuality is a normative and positive aspect of human life that is an essential and integral part of one’s emotional and physical health (George, Norris, Nguyen, Masters, & Davis, 2014; Lindau et al., 2007; WHO, 2006). Sexuality is not only an important part of a person’s life but is a major component in Maslow’s hierarchy of needs (Maslow, 1943). The physical act of sex (i.e., coitus), as well as intimacy, closeness, and sense of belonging are central to humans. Further,

research has shown that sexuality is a key component of psychosocial well-being among survivors and their partners (Henson, 2002; Tierney, 2008; Street et al., 2010). While sexuality can include various dimensions (e.g., gender identity, eroticism, how we view ourselves as sexual beings, etc.), they are not always experienced or expressed (WHO, 2006) by the survivor, as a result a key factor of quality of life for many survivors may be lacking.

Life concerns due to the patients experience with the disease and side effects from treatments may overshadow sexual needs (American Cancer Society (ACS), 2017; Anllo, 2000; Olsson, Athlin, Sandin-Bojö, & Larsson, 2013). While the adverse effects of cancer in relation to sexual health have been at the forefront of research (Harrington et al., 2010; Reese, 2011), the notion of positive sexual health and sexuality are becoming more popular (Higgins & Hirsch, 2007; Philpott, Knerr, & Boydell, 2006; Santos-Iglesias, Byers, & Moglia, 2016; Schwartz & Young, 2009) and have been found to be critically important to sexual health research. Researchers have begun to expand theoretical approaches to include a greater emphasis on sexual well-being (Mona et al., 2011; Rosen & Bachmann, 2008; Stephenson & Meston, 2010). Due to this expanded focus that considers more than just limitations with performance related to the sexual response cycle; sexual well-being encompasses both sexual health and sexuality (e.g., sexual functioning, intimacy, and sexual affect and cognition) in ways that positively enrich and enhance communication, personality and love (WHO, 2006). Sexual well-being is multifaceted and has several components that require a multimodal approach to address specific health concerns among cancer survivors. Together sexual quality of life is a fundamental component of well-being for both survivors and their partners (Henson, 2002; Tierney, 2008). To improve the quality of life after cancer, efforts that embrace a sex-positive view that are representative of survivor's needs and experiences are incumbent. One option to improve the sexual health needs

of survivors is to understand the characteristics of survivors who are flourishing (i.e., doing well psychologically). A better understanding of what contributes to human flourishing and positive health during challenging times can inform intervention and prevention efforts that could help build and sustain sexual health assets to improve the quality of life of cancer survivors.

Increasing empirical evidence has indicated beneficial effects of PWB within clinical settings. Many factors, like adverse conditions (e.g. poverty, or chronic illness), can influence positive functioning conceptualized under the eudaimonic umbrella. One way to understand “what works” is to examine differences between the characteristics or attributes of groups of people on shared attributes (i.e., what are similarities and differences between groups based on “what works”). Specifically, describing differences between groups of cancer survivors who share particular characteristics (or relations among attributes) can help us understand more about “what works and for whom” which can in turn inform intervention and treatment efforts. We know that PWB of cancer survivors will differ between people which likely carries different implications regarding interventions. A better understanding of what makes groups of cancer survivors different from each other can provide further insights for targeted treatment efforts. One way to explore differences among groups of individuals is leveraging person-centered approaches using mixture models such as latent profile analysis (LPA). Person-centered analytic models are predicated on the assumption that the population is heterogeneous with respect to how the covariates operate and is different than describing associations among variables. By identifying differing group configurations of PWB among cancer survivors we can empirically uncover substantively meaningful groups that can help shed light on “what works and for whom.” Similarities and differences between the profiles will help in our understanding of the importance of sexual health on PWB.

PWB is a multidimensional scale (i.e., six domains) and LPA would allow us to use all six domains together how the scale was intended to be used (Ryff, 1989). Specifically, identifying profiles will allow the examination of how the individual dimensions function together in a collective manner while uncovering different profiles based on varying combination of PWB domains. Past research interested in groups of PWB have arbitrarily selected cutoff scores to group individuals in high, medium, and low groups typically using plus or minus one standard deviation or quartiles (Wood, & Joseph, 2010; Ryff, Radler & Friedman, 2015); however, this approach is subjective and does not account for the possibility of other configurations of groups or uncertainty in group assignment. LPA allows the data to empirically derive the profiles which is more robust than subjectively choosing cut points. As such, LPA is ideal for demonstrating the properties of the multidimensional PWB scale and will contribute to the literature that examines groups of PWB. Once profiles were identified we examined the groups on various health characteristics (i.e., sexual health) and compare differences. Taking a person-centered approach that compares group of people based on PWB will allow us to identify key entry points for intervention and treatment and ways to help promote and sustain positive aspects that improve the quality of lives of survivors.

Purpose

The purpose of the study is to describe and explore the heterogeneity (i.e., differences) among the different profiles (groups) of well-being in a sample of cancer survivors and in turn examine demographic and sexual health covariates of the profiles. Similarities and differences between the profiles on sexual health components will shed light on the importance of sexual health on individual PWB and can be used to identify individuals who are at-risk and may benefit from therapy designed to improve sexual health outcomes. The sexual health covariates

include sexual pleasure, sexual discomfort, and level of intimacy. In addition, demographic and health characteristics will also be examined as they have been known to influence positive functioning and will help us understand differences between groups of PWB. Figure 1 presents the conceptual model.

Research has shown that sexuality is a key component for psychosocial well-being among survivors and their partners (Henson, 2002; Tierney, 2008; Street et al., 2010). A more nuanced understanding of how a person's PWB can contribute to sexual health in cancer survivors is needed. Sexual well-being and health are aspects of wellness that while important to cancer survivors are often overlooked in the face of illness (ACS, 2017; Anllo, 2000; Olsson, Athlin, Sandin-Bojöö, & Larsson, 2013). Further, sexual health is often conceptualized in a deficit and cure model. This deficit model does not capture the complete story of survivors, as those with dysfunction can still enjoy sexual aspects of life. Taken together, a more positive health perspective regarding sexual well-being and health understanding is needed. Taking a positive health approach, in this study we examine differential profiles of psychological well-being, various demographic and sexual health characteristics of the profiles.

Research Aim & Hypotheses

The aim of this study is to examine the extent to which sexual health covariates are differentially associated with profiles (i.e. groups) of PWB among cancer survivors. To accomplish this aim, we will: (1) Identify the number of profiles (groups) of PWB that best fit the data; and (2) Examine demographic (i.e., Sex, Age, SES, Race, Type of Cancer, and Relationship Quality) and Health characteristics (i.e., Physical and Mental/Emotional Health, Physical and Mental/Emotional Health of Partner and Sexual Health) of PWB profiles. Principally, demographics and sexual health variables will be used to examine differences on the

various groups of PWB. We hypothesize that (1) more than one profile of PWB will emerge, and (2) that there will be demographic and sexual health differences between the profiles.

Definition of Key Terms

The following definitions are provided to ensure uniformity and understanding of the terms used throughout the study.

Cancer survivor - Cancer survivors are people who have been diagnosed with cancer and the individuals in their lives who are affected by the disease (this can include family members, friends, and caregivers) (CDC, 2018). Survivorship can include the cancer diagnosis, active treatment, cancer-free interval, after a recurrence or second cancer, and issues that accompany the end of life (CDC, 2018; Hudson, 2005; Mullan, 1985; Rowland & Bellizzi, 2008).

Positive Health – focuses on promoting strengths that contribute to a healthier, longer life that encompasses more than the absence of illness (Seligman, Peterson, Barsky, Boehm, Kubzansky, Park, & Labarthe, 2013).

Psychological well-being – is a multidimensional model of positive psychological functioning in which people feel their lives have a sense of purpose and direction, that they can manage the demands of their life situations, that personal talents and potential are being realized over time, able to have close, valued connections with significant others, having the strength to follow personal convictions (even if they go against conventional wisdom), and the capacity to see and accept one's strengths and weaknesses (Ryff, 1989; Ryff & Singer 1998; Ryff, Singer, & Love, 2004).

Sexual Dysfunction - "Sexual dysfunctions are a heterogeneous group of disorders that are typically characterized by a clinically significant disturbance in a person's level of sexual desire, ability to respond sexually, or experience of sexual pleasure. These include: delayed

ejaculation, erectile disorder, female orgasmic disorder, female sexual interest/arousal disorder, genito-pelvic pain/penetration disorder, male hypoactive sexual desire disorder, premature (early) ejaculation, substance or medication-induced sexual dysfunction, other specified sexual dysfunction, and unspecified sexual dysfunction.” (American Psychiatric Association, 2013).

Sexual Health - “...a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity and requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected, and fulfilled” (WHO, 2006).

Sexual Response Cycle – is a four-stage physiological response to sexual stimulation consisting (in the order they occur) of desire and excitement, plateau, orgasm, and resolution (Kaplan, 1979; Masters, & Johnson, 1966).

Sexuality - is a multidimensional construct that is an integral component of the human experience, central throughout the life course and expressed and experienced in thoughts, fantasizes, desires, gender identities and roles, how we view ourselves as sexual beings, sexual orientation, eroticism, pleasure, intimacy, behaviors (e.g. various sexual acts like kissing), reproduction and relationships (WHO, 1975, 2006; Wilmoth, 2006).

Well-being - is a multifaceted concept that includes subjective, social, and psychological dimensions as well as health-related behaviors and can be described as judging life positively, having a sense of fulfillment, positive functioning and feeling good (CDC, 2016; Diener, 2000; Ryff & Keyes, 1995).

CHAPTER 2: LITERATURE REVIEW

For well over 30 years we have known of the health benefits of sexuality (Onder et al., 2003; Palmore, 1982; Smith, Frankel, & Yarnell, 1997) and that it is a normative and positive aspect of human life that is essential and an integral part of one's emotional and physical health (George, Norris, Nguyen, Masters, & Davis, 2014; Lindau et al., 2007; WHO, 2006). During a time when treatment goals have begun to shift from simply preventing and treating diseases to that of enhancing positive aspects of life, understanding *what makes us well* is not only imperative but vital to insure optimal well-being (Ryff & Keyes, 1995). A better understanding of what contributes to this and positive health during these challenging times will in turn improve the quality of life of cancer survivors. In the effort to promote well-being after cancer, embracing a sex-positive view that is representative of survivor's needs and experiences are incumbent. Sexual well-being encompasses both sexual health and sexuality (e.g., one's sexual functioning, sexual motivation and sexual affect/cognition) that positively enrich and enhance communication, personality, and love (WHO, 2006). Further, sexual quality of life is a vital component of well-being as reported by survivors and their partners (Henson, 2002; Tierney, 2008). In line with a positive health approach, progress towards understanding positive human health begins with first assessing human flourishing (i.e., PWB, as formulated within the eudaimonic tradition) and then probing the several factors that may influence positive functioning (e.g., sexual health) to help improve survivors' quality of life. Rather than alleviating disorders or dysfunctions, positive health perspectives emphasize helping individuals to enhance their life satisfaction, so they may "flourish" physically and psychologically (Ryff & Singer, 1998). One potential protective factor that has been considered extensively in the health literature in terms of physical health and may also help to improve the PWB among cancer survivors

includes sexual health (i.e., one's sexual functioning (pain/discomfort), sexual motivation (emotional intimacy) and sexual affect/cognition (sexual pleasure)) as represented within those that flourish (i.e., psychologically well).

In line with a positive health approach, the current review will start with the paradigm shift from health to positive health. Ryff's (1989) model of psychological well-being as well as the theoretical underpinnings of each of the six domains of PWB will be examined. Following, the PWB of cancer survivors will be reviewed. Before reviewing the literature on sexual health and cancer we first need to understand the definition and meaning of sexual health, sexuality, and sexual well-being by reviewing the physiological responses to sexual stimulation (e.g. a brief history and the four main phases of the sexual response cycle with examples of how cancer and its treatments can impact each phase) as well as how problems (e.g. sexual dysfunctions) are addressed and conceptualized. Several of the health benefits linked to sexual activity are highlighted, followed by an overview of well-being as it relates to the positive approach of sexual health.

Moving from a *Health to Positive Health Approach*

Over 70 years ago the World Health Organization (WHO) proposed a definition that viewed health as “a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity” (WHO, 1947). While most research on health focused on dysfunction and the treatment of illnesses a more positive outlook regarding health care was needed. The WHO's constitution was to provide a depiction of “health for all” as it moved beyond the dominant negative notion of health based on an “absence” of pathology (Horton, 2009). However, the WHO's definition while groundbreaking, at the time is not without criticism

and limitations (Health Council of the Netherlands, 2010; Horton, 2009; Jadad & O'Grady, 2008; Larson, 1999).

One such criticism is that the nature of diseases has changed, and millions are currently living and thriving with chronic conditions. Health is not a “state of complete physical, mental, and social well-being” nor is it “merely the absence of disease or infirmity” (Horton, 2009). The word “complete” in relation to well-being as a condition, “would leave most of us unhealthy most of the time” (Huber et al., 2011). Adverse health conditions can occur even if disease is not present and one can experience lesser diseases and be healthy (Larson, 1999). Individuals are coping and living longer with diseases such as cancer (NCI, 2016). The WHO's definition thus becomes counterproductive as it declares people with chronic conditions and disabilities as not healthy (Huber et al., 2011) and thus minimizes the role of adaptation and coping. Health and illness can be thought of as separate dimensions and not simply opposites (Williams 1993). For example, an increase in coping capacity may be more relevant and realistic than complete recovery, especially in diseases such as cancer when long-term effects can persist throughout the person's life (Gotay, & Muraoka, 1998; Huber et al, 2011; Yabroff, et al., 2007). As such, the ability to adapt and to self-manage are preferable and should be included in definitions of health (Health Council of the Netherlands, 2010; Huber et al., 2011) as well as in intervention and treatment efforts. Since health and well-being are modifiable, understanding group characteristics of those that flourish, interventions can thus promote these health assets, such as sexual pleasure, and build on strengthening these assets thereby supporting a healthy life. This approach fits well with the eudaimonic approach of well-being as Ryff's (1989) measure of psychological well-being operationalize how much individuals see themselves thriving in their

personal life. Concern should be given to human capacities to maintain well-being and health in the face of significant life challenges such as cancer.

Psychological Well-Being

Although well-being is a dynamic concept that includes subjective, social, and psychological dimensions the best methods to conceptualize and measure health and other aspects of well-being are still being debated (Cooke, Melchert, & Connor, 2016). Past research on health and well-being relied heavily on the traditional medical model, and as a result focus has been on reducing disease and disability. This model was useful in the development of effective treatments for many illnesses but fell short in addressing that the absence of pathology does not necessarily correlate with positive dimensions of health and well-being (Keyes, 2002).

There is an assortment of conceptualizations of well-being; however, the two most influential and distinct theoretical approaches in psychology include hedonic and eudaimonic (Lent, 2004; Ryan & Deci, 2001). Both Eudaimonia and Hedonia stem from Aristotle's work on the composition of the good life, with each approach characterizing well-being (Ryff & Singer, 2008). The hedonic approaches focus on pleasure and happiness (Ryan & Deci, 2001), with the most prominent model being subjective well-being. A tripartite (three-way) model consisting of satisfaction with life, the absence of negative affect, and the presence of positive affect (Diener, Emmons, Larsen, & Griffin, 1985) are the three constructs that proponents of this perspective use to conceptualize well-being. The eudaimonic approaches to well-being suggest that psychological health is achieved by fulfilling one's potential, functioning at an optimal level, or realizing one's true nature (Lent, 2004). The distinct difference between hedonic and eudemonic well-being is that the eudaimonic approach focuses on a larger number of life domains. For example, one of the most prominent eudaimonic models is the psychological well-being model

(PWB; Ryff, 1989; Ryff & Keyes, 1995). According to Ryff (1989) psychological well-being is a multidimensional process of self-realization that consists of six dimensions that include autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. These components may be related but have unique meanings (see Table 1). At the essence of Eudaimonia is the idea of “striving toward excellence based on one’s unique potential” (Ryff, & Singer, 2008) and was at the forefront in Ryff’s efforts in the conception of PWB that was explicitly concerned with the development and self-realization of the individual (Ryff, 1989). During a time when treatment goals had begun to shift from simply preventing and treating diseases to that of enhancing positive aspects of life, understanding *what makes us well* was not only imperative but vital to insure optimal well-being (Ryff & Keyes, 1995).

Ryff believed there was more to “being well” than feeling happy and satisfied with life. If one looks for happiness all the time, they will likely be disappointed (Aristotle, 1925; Diener, 2000; Ryff, & Singer, 2008). In addition, most individuals including those with disabilities, unemployed, and who were abused report themselves happy (Diener, 2000; Taylor & Brown, 1988). Understanding what contributes to well-being is influenced by ones’ context and environment and best construed through growth and human fulfillment (Ryff & Singer, 2008). With extensive review of philosophy and clinical, humanistic and life-span developmental psychology literature, Ryff derived the concept PWB to include six distinct components of positive psychological functioning (Ryff & Keyes 1995; Ryff & Singer, 1996). These six dimensions presented divergence to the existing indicators focused on happiness, feeling good, or life satisfaction and taken together encompass a breadth of wellness (Ryff, 2014). The dimensions include, (1) positive evaluations of oneself and one's past life (Self-Acceptance), (2)

a sense of continued growth and development as a person (Personal Growth), (3) the belief that one's life is purposeful and meaningful (Purpose in Life), (4) the possession of quality relations with others (Positive Relations with Others), (5) the capacity to manage effectively one's life and surrounding world (Environmental Mastery), and (6) a sense of self-determination (Autonomy). While there has been an increase in tools used to assess well-being, with even some developing from positive psychology, few were clearly formulated in theoretical foundations and overlook important aspects of positive functioning (Ryff, 1989). Ryff's model of PWB has strong conceptual foundations as well as extensive psychometric evaluation and can explain why this model has withstood extensive scrutiny over time and has been used across various domains of inquiry (Ryff, 2014). A summary of each dimension of well-being as well as the underlying theoretical conceptions are discussed.

Autonomy. Taken from Carl Rogers concept of a fully functioning person (1961), Abraham Maslow's self-actualization (1968), and Carl Jung's individuation (1933), individuals with autonomy are independent and able to live their life according to their own convictions (Ryff & Singer, 2008; Ryff, 2017). An autonomous person is self-reliant, can resist social pressures, regulate their behavior from within, and gain a sense of freedom from everyday norms (Ryff & Singer, 2008; Ryff, 2017; Neugarten, 1973). Contrarily, someone who does not have strong autonomy conforms to social pressures, are concerned with the expectations and evaluations of others, and constantly looks to others for guidance and direction (Ryff & Singer, 2008).

Self-acceptance. Possessing long-term awareness and acceptance of personal strengths and weaknesses is a central feature of self-acceptance (Ryff & Singer, 2008). Positive self-regard is a crucial component of self-actualization (Maslow, 1968), maturity (Allport, 1961), optimal

functioning (Rogers, 1961), and mental health (Jahoda, 1958). Being able to accept the good and bad aspects of one's past, current life, choices, and behaviors are consistent with self-acceptance (Erickson, 1959; Neugarten, 1973; Ryff, 2017). Someone that has low self-acceptance is often confused about their identity, self-critical, and wants to be different or change characteristics/aspects about themselves (Ryff & Singer, 2008).

Personal growth. Personal growth involves the continuous process of developing one's potential and is thought to be most in line with the meaning of Aristotle's eudaimonia (Ryff & Singer, 2008). Self-actualization (Maslow, 1968; Norton, 1976), positive mental health (Jahoda, 1958), and confronting diverse life challenges assist an individual in fulfilling personal potential (Ryff & Singer, 2008). High personal growth is characterized by the extent to which an individual makes use of their potential, is open to new life experiences, and grows and develops as a person over time (Rogers, 1961; Ryff & Singer, 2008; Ryff, 2017). Individuals with low personal growth do not feel the need to develop, are often bored or uninterested in life, and are at a personal standstill (Ryff & Singer, 2008).

Purpose in life. This aspect of well-being is concerned with having meaning (Jahoda, 1958) and a sense of purpose in one's life that contributes to a sense of direction (Allport, 1961). A challenge to living authentically is creating direction and meaning out of life (Sartre, 1956). Being able to change purpose or goals at different life stages (Erickson, 1959; Jung, 1933; Neugarten, 1973) and/or search for meaning during suffering and adversity (Frankl, 1959) attribute to living a purposeful life. Individuals with low levels of this quality of well-being lack values and beliefs that give life meaning, have no direction, few goals, and may not see a greater purpose in life (Ryff & Singer, 2008).

Positive relations with others. Love, empathy, and affection are emphasized in philosophical accounts of the “criterial goods” of a well-lived life (Becker, 1992). The ability to love is a central component of mental health (Jahoda, 1958). Key features of positive relations with others include having strong feelings of empathy, affection and the ability for great love, and the ability to form deep friendships and close relationships with others (Maslow, 1968; Ryff & Singer, 2008). Being capable of intimacy, having the ability to compromise in relationships with others, and having concern for the welfare of others is central to positive functioning (Ryff & Singer, 2008; Ryff, 2017). Individuals that lack quality relations with others are unwilling to compromise to sustain important relationships, have few close and/or trusting relationships with others, and are unable to show concern, affection, or intimacy (Ryff & Singer, 2008).

Environmental mastery. The capacity to effectively manage life situations and the surrounding world in accordance with one’s values and needs is important to positive functioning (Ryff, 2017). Further, having the ability to choose, create, and/or control environments to one’s personal needs, and taking advantage of new opportunities (Allport, 1961; Erikson, 1959; Jahoda, 1958; Neugarten, 1973) are necessary for living well (Ryff, 2017). A lack of resources to cope, problems with one’s environment, and frequent stress can all contribute to feelings of powerlessness over one’s environment and/or situation (Ryff & Singer, 2008). Adapting to problems and not being overwhelmed by stress assist in the effort to gain mastery in one’s surrounding environment (Ryff & Singer, 2008; Ryff, 2017).

Compared to traditional definitions, Ryff’s six dimensions of psychological well-being offer a more complete picture of well-being and what it means to *be healthy*. Psychological adjustment can not only be impacted by challenges such as cancer, but often unfold over the course of a lifetime (Seligman & Csikszentmihalyi, 2000). The conceptualization of six

dimension of well-being among individuals with chronic illness provides several avenues to improve the well-being of survivors. Understanding how groups based on PWB differ from each other on several sexual health components is essential. Understanding the different groupings of positive functioning could lead to further understanding of these essential components for skills needed to thrive under adverse conditions. The current study plans to add to this by utilizing Ryff's model of psychological well-being among a sample of cancer survivors.

Psychological well-being of cancer survivors. The concept of psychological well-being has been studied extensively and found to be important in the development of optimal health. Past research has linked psychological well-being with a variety of health outcomes, including inflammation (Friedman et al., 2007; Morozink et al., 2010), sleep quality (Friedman, 2011; Friedman et al., 2005), and cardiovascular risk (Boehm & Kubzansky, 2012; Surtees, Wainwright, Luben, Khaw, & Day, 2006) to name a few. For example, the association between eudaimonic well-being and cardiovascular disease in a patient population showed that in more than 20,000 participants aged 40-80 a greater sense of control was associated with a reduced risk of cardiovascular mortality 5 years later (Surtees et al., 2006). Further, in a study of older adults, self-efficacy or people's beliefs about their ability to exercise control over themselves and their environment (i.e., environmental mastery) was examined in relation to life stress and health (Montpetit & Bergeman, 2007). Self-efficacy partially mediated the relationship between stress and physical health, suggesting that having a sense of self-efficacy can affect both the way stress is interpreted and managed, thus impacting health outcomes (Montpetit & Bergeman, 2007).

Several studies have also examined well-being among cancer survivors (Carpenter, Brockopp, & Andrykowski, 1999; Cordova, Cunningham, Carlson & Andrykowski, 2001; Costa & Pakenham, 2012; Costanzo, et al., 2012; Holland & Holahan, 2003). In a study among women

diagnosed with breast cancer, Holland and Holahan (2003) used a cross sectional design to examine the relation among social support and coping with positive adaptation to breast cancer (defined as psychological well-being and positive health behavior). Perceived social support and approach-oriented coping strategies predicted higher psychological well-being (Holland & Holahan, 2003). In a study that viewed cancer as a psychosocial transition with potential for positive and negative outcomes, compared to matched controls, breast cancer survivors showed greater posttraumatic growth especially in the domains relating to others and appreciation for life (Cordova, Cunningham, Carlson & Andrykowski, 2001). Additionally, looking at the personal narratives among breast cancer survivors Carpenter, Brockopp, & Andrykowski (1999) identified survivors based on self-transformation. Findings revealed that individuals in the positive self-transformation group showed higher self-esteem and well-being than the other two groups (e.g., minimal transformation and feeling stuck).

In a national longitudinal study, Costanzo and colleagues (2012) examined psychosocial impairment and resilience or thriving among cancer survivors compared to individuals without a cancer history. This study focused on four psychosocial domains which include (1) distress, (2) psychological well-being, (3) social well-being, and (4) spirituality. Domains in which cancer survivors reported poorer functioning and decline in functioning following diagnosis as relative to the comparison group were classified as areas of impairment. Areas where equivalent functioning were selected were classified as resilience, and finally domains where cancer survivors reported superior functioning (both pre-post and relative to the comparison group) were classified as thriving. Findings showed that cancers survivors demonstrated impairment relative to the comparison group in mental health, mood, and some aspects of psychological well-being, although some areas of vulnerability were evident prior to cancer diagnosis

(Costanzo, et al., 2012). Conversely, survivors exhibited resilient social well-being, spirituality and personal growth. However, in another study, benefit finding (i.e., personal growth) among patients with thyroid cancer was associated with greater positive affect, wisdom, and spiritual well-being but not greater purpose in life or self-acceptance (Costa & Pakenham, 2012).

Well-being is greatly influenced by the surrounding contexts of people's lives (Ryff, & Singer, 2008). Several studies have highlighted the effects of cancer on an individual's level of well-being. Studies have also examined the predictors of psychological well-being as well as various health outcomes associated with different levels of psychological well-being. One important health outcome that has been found to be associated with well-being but less studied is sexual health.

Sexual Health of Cancer Survivors

There are several definitional issues with sexual health. While no definition is perfect the WHO's (2006) definition is the most commonly used: According to the current working definition, sexual health is:

“...a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.” (WHO, 2006)

Sexual health cannot be defined nor understood without a broad reflection of the underlying important behaviors and outcomes related to sexual health known as sexuality (WHO, 2006). Sexuality is a multidimensional construct that has physiologic, psychological, and

social dimensions, and includes the dynamic interactions between these dimensions (Tierney, 2008). Sexuality is a part of our everyday life and includes more than just the act of sex or reproduction (Canadian Cancer Society (CCS), 2017; WHO, 2006). According to the WHO, sexuality is an integral component of the human experience, central throughout the life course and expressed and experiences in thoughts, fantasizes, desires, gender identities and roles, how we view ourselves as sexual beings, sexual orientation, eroticism, pleasure, intimacy, behaviors, reproduction and relationships (2006). Various acts of sexual activity are included in sexuality such as hugging, touching, kissing, fantasy, masturbation, oral genital stimulation and intercourse. In addition, values, attitudes, relationships and style of dress are all expressions of sexuality (WHO, 1975; Wilmoth, 2006).

Although sexuality can include these dimensions, not all of them are always experienced or expressed (WHO, 2006). An individual's cultural norms, past experiences and developmental stage will influence sexual expression (Katz, 2007; Pelusi, 2006; Wilmoth, 2006). In the hierarchy of human needs, sexual activity was recognized by Abraham Maslow as a basic need, and placed love and connection to others on a high tier (Maslow, 1943). Regardless of ability, sexual orientation, age, or health status, humans are sexual beings and consequently sexuality should be respected as a fundamental right (WHO, 2006), among all people including those with chronic illnesses.

Prior to discussing sexual health and cancer in detail, it is important to understand the physiological responses to sexual stimulation (e.g. the sexual response cycle) and how problems (e.g. sexual dysfunction) are addressed. The next section presents (1) a brief history of the sexual response cycle, (2) the four main phases of the response cycle and how cancer and cancer

treatments can impact each phase, (3) and lastly, how sexual dysfunction is conceptualized and defined.

Sexual response cycle. Kinsey and colleagues (1948) work on sexual behavior in males and females not only challenged conventional beliefs about sexuality but were the first to touch on the phases of sexual functioning. The work of Masters and Johnson (1966) followed and have been credited with characterizing the sexual response as linear and consisting of 4 physiologic phases that include excitement, plateau, orgasm, and resolution. In the late 1970s an appreciation of the psychological component of sexuality lead Kaplan (1979) to modify Masters and Johnson's model to incorporate the concept of desire, and proposed a three-stage model of desire, arousal/excitement and orgasm. Not all experts agree that everyone follows this set pattern of sexual response. For example, some models have proposed a fifth phase in which cognitive appraisal of sexual encounters happen, others have suggested that the female sexual response cycle is not linear but circular in nature (Basson, 2001; Zilbergeld & Ellison, 1980).

Cancer can alter sexuality in terms of desire, excitement, orgasm, and resolution. While the impact of cancer and its treatments can disrupt more than just the phases of sexual response cycle, an understanding of this is needed before we can understand the complex interplay between physiological, psychological, and social dimensions of sexual health for survivors.

Sexual desire. Sexual desire (or libido) is one's interest in sex or sexual activity and can vary from person to person (Barton, Wilwerding, Carpenter, & Loprinzi, 2004; Kandeel, Koussa, Swerdloff, 2001). Desire is a complex phenomenon involving physiologic, behavioral, cognitive, and relationship components (Barton et al., 2004; Schiavi & Segraves, 1995). It includes fantasy or thoughts and has been strongly linked to arousal (Barton et al., 2004; Carey, 2006; Schiavi & Segraves, 1995). State of mind (feelings of depression, frustration, etc.) can impact an

individual's sexual desire (Anlio, 2000; Beckjord & Compas, 2007; Carey, 2006; CCS, 2017; Rosen, Bachmann, 2008; Thomas, 2003). Stress, fatigue and changes to sex hormone levels can reduce one's sexual desire, for instance, in men testosterone plays a strong role in desire and arousal (Barton et al., 2004). Cancer's that target sexual organs or treatment procedures that cause fatigue (such as chemo) may limit an individual's sexual desire and thus their ability to become aroused (Dizon, Suzin, McIlvenna, 2014). Treatments, like hormone therapy, that alter the body can impact an individual's sexual self-esteem resulting in lower sex drive (ACS; 2017; Gallbraith & Crighton, 2008; Hughes, 2008).

Excitement/Arousal. Arousal includes the subjective experience of excitement and pleasure (Tierney, 2003). Seeing someone you find attractive, having a sexual fantasy or thought, having your genitals or other sensitive areas kissed, touched or stroked may all lead to arousal (ACS, 2017; CCS, 2017). This arousal in conjunction with physiologic changes happening to the body, is our body's way of readying itself for sex. For men a sequence of neurovascular, cellular, and local genital changes occurs leading to an erection (Goldstein, Lue, Padma-Nathan, Rosen, & Steers, 2002; Kandeel et al., 2001; Lue, 2000). For women, increased blood flow to the genitalia results in vasocongestion, with vaginal lubrication increasing the clitoris enlarges and the vagina increases in depth and width (Katz, 2007; Schiavi & Segraves, 1995). Cancer and treatments can impact blood flow to genitals resulting in altered arousal or excitement, in addition surgeries, medical therapies and radiation can all influence sexual arousal (Dizon, Suzin, McIlvenna, 2014; Sadovsky et al., 2010; Tierney, 2008).

Orgasm. Orgasm is the sexual climax, which is a period of intense sexual pleasure felt in the genitals followed by the release of sexual tension with a series of rhythmic muscular contractions (Gallo-Silver, 2000; Schiavi & Segraves, 1995). In men, orgasm is a two-stage

process of emission and ejaculation (the muscles around the base of the penis begin to squeeze in rhythm pushing semen through the urethra and out the penis (ACS, 2017; Syme, Mona, & Cameron, 2013; Tierney, 2008). For women, clitoral or vaginal stimulation causes orgasm (Wallen & Lloyd, 2011). Just as changes to sexual desire and arousal are impacted by cancer and its treatments, the ability to orgasm can suffer as well (Anlio, 2000). Surgery may change the ability to be aroused or have an orgasm (ACS, 2017; CCS, 2017).

Resolution. Relaxation follows after sexual arousal and orgasm have been achieved, where contentment and an evaluation of the sexual experience are components of the final phase (Gallo-Silver, 2000; Zilbergeld & Ellison, 1980). An individual's heart rate, breathing and blood pressure return to normal and often feelings of satisfaction and drowsiness occur (ACS, 2017; CCS, 2017). Men usually need a longer resolution or refractory period as compared to women before being able to become aroused again (CCS, 2017). In this period men are unlikely to have another orgasm, where women may be able to have multiple orgasms (one after the other) often with little time between (ACS, 2017).

Conceptualization of sexuality & dysfunction. Historically, sexuality has been conceptualized from a biological and "intercourse centered perspective" (Masters, & Johnson, 1970; Syme, Mona, & Cameron, 2013) with traditional conceptualizations focused on remediating sexual dysfunction in terms of the sexual response cycle (Tiefer, 1991). This biomedical approach is still apparent within the way we define and diagnose sexual dysfunction. The current diagnostic system retains a pathology-focused model for sexual disorders (American Psychiatric Association [APA], 2013). Sexual dysfunctions are disorders that may affect one or more of the phases of the sexual response cycle and are characterized by physiologic or psychological changes that negatively influence sexual functioning thus resulting in

physiological distress or stress within relationships (APA, 2013; Tierney, 2008). Diagnoses for disorders of the sexual response cycle include, Hypoactive sexual desire disorder, Female sexual arousal disorder, Male erectile disorder (ED), Orgasmic disorders, and Genito-pelvic pain/penetration disorder previously known as sexual pain disorders (e.g. dyspareunia and vaginismus; APA, 2013).

Although the sexual response cycle focuses on sexual activity and provides a standardized framework for assessing and diagnosing sexual dysfunction, sexuality is a broader concept (Tierney, 2008). The impact of cancer and its treatments on individuals' sexuality is multifaceted requiring a more complex understanding of post cancer sexuality than the biomedical model can provide (Syme, Mona, & Cameron, 2013). For instance, moving beyond simply referring to the physiological sexual function or performance (Cleary, & Hegarty 2011) aspects of sexual health. To understand the effects of a disease like cancer one must consider the multidimensional concept of sexuality and not simply the act of sexual intercourse or activity (Tierney, 2008). Cancer survivors may experience a range of physical, psychological, and social long-term and late effects that can persist throughout survivorship (Gotay, & Muraoka, 1998; Stein, Syrjala, & Andrykowski, 2008; Yabroff, et al., 2007). Among these concerns, and among the most commonly cited by survivors, are symptoms that impact the survivors' sexual well-being (DeSimone, Spriggs, Gass, Carson, Krychman & Diaz, 2014). Sexual well-being relates to how people experience their sexual selves and relationships (Lee, & Lee-Ann, 2016) and is a term that is used to encompass sexuality and sexual health issues (Davis & Taylor, 2006) such as sexual intimacy or pleasure.

Traditional conceptualizations of sexuality have been very much like those of health and well-being, based on the biomedical model that focuses on rectifying the disease processes and

dysfunction. For sexual health, this has largely been dominated by addressing unwanted outcomes such as sexual transmitted infections (STIs), unintended pregnancy, and sexual violence and coercion (Carpenter, 2010; Dixon-Mueller, 1993; Higgins & Hirsch, 2007; Philpott, Knerr, Boydell, 2006; Pick, Givaudan, & Kline, 2005). The diagnosis and treatment of altered sexual health is further challenging due to the complex interrelationships between physiological, psychological, and social dimensions of sexuality (Tierney, 2008). Common sexually-related alterations of cancer by each domain are as followed; (1) physiological dimension can include but is not limited to erectile dysfunction, painful intercourse, lowered arousal, fatigue, loss of fertility, menopause, diarrhea, skin changes, nausea, genital pain, and decreased physical stamina (Tierney, 2008; Treanor, & Donnelly, 2014); (2) psychological dimension can include but is not limited to changes in body image, fear of relapse, decreased self-confidence, depression, anxiety, grief, worry about loved ones, and concerns about the reaction of the sexual partner (Baker, Denniston, Smith, & West, 2005; Holland, & Reznik, 2005; Krebs, 2006; Knobf, 2006; Thaler-DeMers, 2001); and social dimensions can include but are not limited to struggling to resume sexual activity, concerns about discomfort during sexual experiences as well as the sexual partner worrying about hurting the survivor can all impact sexuality (Hughes, 2008; Tierney, 2008).

Sexuality and sexual health issues following cancer are complex as survivors are at risk for alterations in sexuality and sexual health because of changes in the physiologic, psychological and social dimensions of sexuality (Melo, Carvalho, & Pelá, 2006; Tierney, 2008). Given the multifaceted nature of sexual health (dysfunction) in cancer survivors interventions need comprehensive assessment and treatment plans to address a diverse array of sexual health needs (Bober et al., 2015; Thygesen, Schjødt, & Jarden, 2012). As such, a better understanding

of whether sexual pleasure, emotional intimacy and low levels of pain/discomfort can be leveraged to improve well-being.

Sexual Health and Well-Being

This section highlights the health benefits linked to sexual activity and a brief overview of sexual health and well-being as it relates to the study's positive health approach.

Health benefits of sex. For over 30 years we have known that there are health benefits associated with sexual activity and longevity (Onder et al., 2003; Palmore, 1982; Smith, Frankel, & Yarnell, 1997). In a 25-year follow-up study, it was found that greater sexual frequency predicted a lower annual death rate in men, whereas enjoyment of intercourse predicted lower mortality among women (Palmore, 1982). Physical health is positively correlated with sexual activity (Lindau et al., 2007) and there is strong link between a healthy sex life and higher quality of life across the lifespan (American Association of Retired Persons (AARP), 1999 Laumann et al., 2005; Lindau et al., 2007). Further, researchers have found that sexual activity is associated with positive outcomes within a relationship, physical and mental health, and quality of life (Bouman, Arcelus & Benbow, 2006; Brody, 2010; Chao et al., 2011; Gott & Hichliff, 2003; Malatesta, 2007). In a study that examined the relation between health and several dimensions of sexuality in middle age and older adults, people in very good or excellent health were 1.5 to 1.8 times more likely to report an interest in sex than those in poorer health (Lindau & Gavrilova, 2010). Health benefits such as improved immune system (Charnetski & Brennan, 2004), lower blood pressure (Brody, 2006; Light, Grewen, & Amico, 2005), lower heart disease, attacks, and improved cardiovascular function (Hall, Shackelton, Rosen, & Araujo, 2010; Ebrahim et al., 2002; Liu, Waite, Shen & Wang, 2016), lessen pain (Uryvaev & Petrov, 1996; Lee, Macbeth, Pagani & Young, 2009), may reduce risk of prostate cancer (Giles et al., 2003;

Leitzmann et al., 2004), improved sleep and reduced stress (Brody, 2006; Kling, 2017) have all been attributed to sexual activity.

In a worldwide study of sexual attitudes, beliefs and sexual behaviors 27,500 men and women were surveyed and relationships between subjective sexual well-being and a variety of predictors and outcomes of sexual behavior, including overall happiness were found (Laumann et al, 2006). Sexual well-being was positively associated with both physical and mental health, sexual activity levels, and the relationship context (Laumann et al, 2006). Brody and Costa (2009) found in a sample of 2,810 Swedish adults that penile-vaginal intercourse (PVI) was positively associated with sexual satisfaction, life satisfaction, partnership, and mental health.

Just as sexual activity has been linked with improved health benefits, sexual dysfunction has been found to impair quality of life (Laumann, Paik, Rosen, 1999). Poor health has been shown to contribute to lower levels of desire and genital pain. Appa and colleagues (2014) reported a strong relation between the total number of chronic conditions reported by women and the likelihood of reporting low interest or satisfaction with sexual activity and difficulty with lubrication, and orgasm.

Despite the well-documentation of sexual dysfunction in cancer survivors, interventions to enhance sexual function, health, and well-being are lacking and typically address either physical or psychological consequences of treatment (Bevans et al., 2017; Bober et al., 2015; Bober, Recklitis, Michaud, & Wright, 2018; Brotto, Yule, & Breckon, 2010; Taylor, Harley, Ziegler, Brown, & Velikova, 2011; Thygesen, Schjødt, & Jarden, 2012). In addition, clinicians tend to focus on disease outcomes and lack the experience in handling more intimate issues, and hence, certain problems such as intimacy and sexuality have been largely neglected (Hordern & Street, 2007). There is a crucial need to take an integrative approach to managing sexual

dysfunction and in turn promoting sexual well-being with cancer survivors. Consistent with our understanding of sexuality as a multidimensional construct, delivery of information about sexuality is optimized when it is not only targeted to a survivor's physical needs but is also congruent with each survivors' experience of self-efficacy, and the cultural context (Bober & Varela, 2012). One way to improve a person's well-being is through incorporating and understanding the multifaceted needs of the individual best suited for promotion of health assets.

Sexually well. When viewed holistically and positively sexual health is about well-being (WHO, 2006). A vital component of well-being as reported by survivors and their partners is sexual quality of life (Henson, 2002; Tierney, 2008). Sexual intimacy and sexual activity result through a complex interplay of psychological, biological, social and cultural factors. Quality of sex life can be looked at by understanding sexual pleasure, whether emotional intimacy is included and pain to name a few. These aspects are important to consider as sexuality and intimacy can reduce emotional distress and improve psychosocial response to a cancer diagnosis (Hordern, & Currow, 2003; Wimberly et al., 2005) leading to improvements in the survivor's overall quality of life.

It is of no surprise that the quality of one's sex life has been linked to health improvements and thus improved quality of life (AARP, 1999; Bouman, Arcelus & Benbow, 2006; Brody, 2010; Chao et al., 2011; Gott & Hichliff, 2003; Laumann et al., 2005; Lindau et al., 2007; Malatesta, 2007). Sexual satisfaction is not only important for individual pleasure but also to over-all well-being. Research has shown that there is an association between sexual functioning and well-being (Zebrack et al., 2009; Lee et al., 2016). While past studies have demonstrated that lower levels of sexual activity and sexual problems are negatively associated with well-being, these studies define sexual health from a behavioral (e.g., how frequently do

you engage in sexual activities) and impairment perspective (e.g., difficulty becoming sexually aroused) and do not get at the multifaceted nature but only the physiological aspect of sexual health (Zebrack et al., 2009; Lee et al., 2016). In a study conducted by Lee and colleagues (2016) better sexual health and functioning were associated with positive subjective well-being. This study used a measure that examined quality of life as opposed to psychological well-being and while having looked at a few domains that fall under the eudaimonic umbrella (e.g., autonomy, self-realization) several key components related to human flourishing were missing (e.g., positive relations with other, environmental mastery). Conversely, there is a need to understand more nuanced details of how psychological well-being (formulated within the eudaimonic tradition) are related to sexual health as well as the beneficial effects for well-being due to factors such as sexual pleasure and intimacy-and not just sexual function and behaviors.

One way to understand “what works” is to examine differences between the characteristics or attributes of groups of people on shared attributes (i.e., what are similarities and differences between groups based on “what works”). Specifically, describing differences between groups of cancer survivors who shared characteristics (or relations among attributes) can help in our understanding of “what works and for whom” which can in turn inform intervention and treatment efforts. Potential protective factors that has been considered extensively in the health literature in terms of physical health and may also help to improve the PWB among cancer survivors specifically is understanding how sexual pleasure, emotional intimacy and pain/discomfort (i.e., sexual health/well-being) are characterized within those that are doing psychologically well.

PWB of cancer survivors will likely differ between people which may carry important implications regarding intervention efforts. A better understanding of what makes the groups of

cancer survivors different from each other can provide insights for targeted treatment efforts. One way to explore these differences among groups of individuals is using person-centered models such as latent profile analysis (LPA). Given the multidimensionality of PWB scale (i.e., six domains), being able to identify groups would allow for the examination of how the dimensions interact together that will highlight various groups of PWB (i.e., aspects of PWB). To demonstrate the properties of the multidimensional PWB scale we will use latent profile analysis to empirically derive the profiles which is more robust than subjectively choosing the groupings. Being able to describe differences among cancer survivors who share characteristics (or relations among attributes) can help us understand more about “what works and for whom.” Since we know that PWB of some cancer survivors can differ from those of others and these may carry different implications in terms of interventions, understanding the characteristics of cancer survivors and their environments is important. Person-centered analytic models such as LPA assume that the population is heterogeneous with respect to how the covariates operate and thus uncover a different meaning than describing associations among the variables PWB and sexual health. Once these groups (i.e., profiles) are identified we can examine them in relation to various sexual health covariates to examine how the groups differ. Similarities and differences between the profiles will help in our understanding on the importance of PWB, in addition, by examining characteristics of the profiles and what makes them different from each will provide unique information for possible entry points for intervention. We need creative interventions that improve sexual dysfunction and strengthen “what works for whom” to give survivors a chance at a healthier life.

In line with a positive health approach, by focusing on people and understanding the characteristics that differentiate groups of survivors based on their PWB will allow us to identify key strategies to help promote and sustain positive aspects of PWB to support cancer survivors.

CHAPTER 3: METHODS

Procedures and Participants

Data for the current study were drawn from the Midlife in the United States (MIDUS) survey, conducted in 1995-1996 (Wave 1), 2004-2005 (Wave 2), and 2013-2014 (Wave 3). MIDUS is a national survey of more than 7,000 Americans that collected data on psychological, social, and behavioral factors related to physical, mental health, well-being, and sexuality (Brim, Ryff, & Kessler, 2004; Ryff et al., 2007). The collective aim was to investigate the role of behavioral, psychological, and social factors in age-related variations in health and well-being in a national sample of Americans (Brim, Ryff, & Kessler, 2004; Ryff et al., 2007). Participants completed a telephone interview and self-administered questionnaires regarding demographic information, cancer status, and sexuality among a series of other questions across various individual and social domains. The current study used only individuals with a diagnosis of cancer, which was determined by an affirmative response to the question “*Have you had cancer?*” In the present study, we follow the Center for Disease Control and Prevention (CDC) Cancer Survivorship’s definition of a cancer survivor to include individuals diagnosed with cancer from the time of diagnosis through the remainder of life (CDC, 2018). The current study used wave 2 (2004 - 2005) of the MIDUS data that included the largest sample of cancer survivors (N = 657) and were ages 35 to 84. Wave 2 assessed cancer type of participants and was used as a control in all the models.

Measures

Demographic variables. Several demographic variables were used to help understand the group characteristics of psychological well-being; these include, sex, race, age, socio-economic status (SES), cancer type and relationship quality. Sex is coded such that males are the

reference group. Race is coded such that White is the reference group. Age, socio-economic status, and relationship quality will be grand mean centered. Type of cancer is coded such that Prostate cancer is the reference group.

Psychological well-being. The self-reported psychological well-being scale was completed as part of the MIDUS I, II and III survey assessments. The psychological well-being measure is made up of six subscales of well-being that include positive relations with others, self-acceptance, autonomy, personal growth, environmental mastery, and purpose in life. Previous studies have evaluated the psychometric properties of the scale among several populations both young and older (Ryff & Keyes, 1995). Each subscale consists of 7 items that include both positive and negative worded items. Item values were coded such that higher scores indicated higher levels of well-being. Sample items for each dimension include, *Autonomy*, “I tend to be influenced by people with strong opinions”; *Environmental Mastery*, “I am quite good at managing the many responsibilities of my daily life”; *Personal Growth*: “I think it is important to have new experiences that challenge how you think about yourself and the world”; *Positive Relations with Others*: “People would describe me as a giving person, willing to share my time with others”; *Purpose in Life*, “Some people wander aimlessly through life, but I am not one of them”; and *Self-Acceptance*: “In many ways I feel disappointed about my achievements in life” (reverse scored). Sample questions for each of the six dimensions can also be found in Table 1. Each of the six dimensions were assessed with seven response options ranging from “*agree strongly*” to “*disagree strongly*”. Cronbach alphas indicated adequate reliability across all six dimensions ($\alpha = .70 - .84$; Ryff et al., 2007).

Physical and mental health. Physical and mental health were examined by self-reported physical health; self-reported mental and emotional health; spouse’s or partner’s physical health

as reported by the survivor; and spouse's or partner's mental and emotional health as reported by the survivor. Response options included 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor.

Sexual health. Sexual health encompasses both sexual health and sexuality and included sexual pleasure, sexual pain and discomfort, and level of intimacy.

Emotional intimacy was assessed by the question, "To what extent would you say that your sexual relationship(s) include emotional intimacy?" Responses ranged from "a lot" to "not at all."

Sexual pleasure was assessed by the question, "How often do you experience pleasure in your sexual interactions?" Responses ranged from "never" to "always."

Pain and discomfort were assessed by the question, "How often do you experience pain or discomfort in your sexual interactions?" Responses ranged from "never" to "always."

Analytic Plan

Proposed model. Using a sample of cancer survivors the current study identifies and examines characteristics and differences among groups (i.e., latent profiles) of psychological well-being and examines demographic and sexual health factors that differentiate the groups. Specifically, the current study has two goals. First, to examine the heterogeneity (i.e., differences) of psychological well-being among a sample of cancer survivors using Latent Profile Analysis (LPA). LPA is a person-centered approach that allows for the identification of different profiles of PWB whose group characteristics can be examined and compared (using multinomial logistic regression) on sexual health items. The sexual health covariates include sexual pleasure, sexual discomfort, and level of intimacy. Figure 1 presents the proposed model that shows latent PWB

profiles are identified first then demographic, physical and mental health, and sexual health covariates are examined to understand differences between the PWB profiles.

Class enumeration. To create profiles of psychological well-being we used Latent Profile Analysis (LPA) using a subsample of cancer survivors ($N = 657$). LPA is a class of mixture models that examines heterogeneity in data and identifies sub-groups (i.e., profiles) of individuals that exists within the data (Lanza, Tan, & Bray, 2013; Masyn, 2013, Vermunt, 2010). Specifically, following Asparouhov and Muthén's (2014) manual three-step approach using Mplus 7.4, we fit a series LPA models to determine the number of profiles that fit the data best using six continuous measures of PWB that include autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The three-step approach allows one to specify complex mixture models, like LPA with covariates without the variables influencing the classifications of the latent profile model (Nylund-Gibson, Grimm, Quirk, & Furlong, 2014).

To establish the final number of latent profiles with the best fit we started with a 1-class model and added profiles until we no longer obtained good fit or until the model did not converge. To assess model fit we used several model fit indices that included -2 Log Likelihood (-2LL), Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), Consistent Akaike Information Criteria (CAIC), Approximate Weight of Evidence Criterion (AWE), the Lo-Mendell-Rubin adjusted likelihood ratio test (LMRT), and the bootstrapped likelihood ratio test (BLRT). Lower values of -2LL, AIC, BIC, CAIC, and AWE indicate better model fit. (Nylund, Asparouhov, & Muthen, 2007). The LMRT and BLRT tests whether a model with k profiles fit better than a model with $k-1$ profiles (Lo, Mendell, & Rubin, 2001). Entropy indicates

the degree of separation between profiles and is an indication of the quality of the profiles (Nylund-Gibson et. al., 2014).

Once we determined the best fitting model and identified the number of latent profiles, we examined demographic and sexual health covariates using the *auxiliary* statement in Mplus 7.4. This created a new data set that included all specified variables in the *auxiliary* command, the latent class probabilities, and the modal class assignments. Using the new data set, we fixed the logits for the classification probabilities for the most likely latent class membership to ensure that the parameters from the latent profile model are not also characterized by the auxiliary variables (Nylund-Gibson et. al, 2014).

Demographic and sexual health characteristics. Once we identified our best fitting LPA model, we assessed covariates of each group using multinomial regression and report the odds of being in one PWB profile compared to another. We examined differences between profiles on a series of demographics variables that included sex, race, age, SES, cancer type and relationship quality. We also examined physical and mental health and sexual health covariates among each PWB group. All models were run using the Robust Maximum Likelihood Estimator (MLR) to adjust for non-normality in the data.

Missing data. To minimize bias due to missing data, we used Full Information Maximum Likelihood (FIML) available in Mplus 7.4 (Muthén & Muthén, 1998 - 2012). Rather than remove individuals like listwise deletion, FIML treats all observed indicators as latent factors allowing individuals to contribute whatever data they have available to the likelihood function. Under the missing at random assumption (MAR), estimates obtained from the FIML model will be unbiased.

CHAPTER 4: RESULTS

Descriptive Statistics

Descriptive information for all variables is presented in table 3. The sample of cancer survivors ($N = 558$) were predominantly older ($\bar{x} = 63.78$ years), White (94.4%), females (59.3%), whose annual household income was approximately 40,000 dollars ($\bar{x} = 40.74$). The different cancer types include Prostate Cancer (12.2%), Reproductive cancers including Breast, Cervical, Ovarian, and Uterine Cancers (29.2%), Skin Cancer or Melanoma (38%), and Colon, Lung, Lymphoma/Leukemia, and Other Cancers (28.7%).

Latent Profiles of Psychological Well-Being among Cancer Survivors

Results of the Latent Profile Analysis (LPA) indicated that a four-profile model of Psychological Well-Being (PWB) best fit the data (see Table 4). Of the models with a significant LMRT, the four-profile solution had the lowest -2LL, AIC, BIC, CAIC, and AWE. Entropy for the four-profile model was .81, indicating acceptable class separation (Grimm et al., 2016). The four latent profiles included a *High PWB profile*, that had the highest average scores across all PWB dimensions, a *High-Moderate PWB profile*, that had slightly lower averages on PWB dimensions, a *Low-Moderate PWB profile*, that had low averages on PWB dimensions, and a *Low PWB profile*, that had the lowest averages among all PWB dimensions. Table 5 presents each of the PWB means for each profile and figure 2 visualizes the profiles in a plot.

Comparing Demographic and Health Differences of Psychological Well-Being Profiles

We examined several demographic and physical, mental, and sexual health characteristics to better understand differences between the profiles of PWB (High, High-Moderate, Low-Moderate, Low). Table 6 presents the estimates, standard errors, and odds ratios for a multinomial logistic regression that examines various demographic and health covariates with

the four identified PWB profiles. Consistent with positive psychology, High PWB was selected as the reference group to evaluate differences among PWB profiles.

Demographic Characteristics

Age and Sex were not associated with differences in PWB profiles. There was a negative association of SES on the Low ($b = -0.04$, $SE = .02$, $OR = 0.96$) and Low-Moderate ($b = -0.04$, $SE = .02$, $OR = 0.97$) profiles compared to the High PWB profile. That is, individuals with higher SES had higher odds ($OR = 1.04$, 1.03) of being in the High PWB profile compared to the Low and Low-Moderate PWB profiles. Increases in relationship quality were associated with lower odds of being in the Low ($b = -0.61$, $SE = .13$, $OR = 0.54$) and Low-Moderate ($b = -0.44$, $SE = .12$, $OR = 0.64$) PWB profile compared to the High PWB profile. Said differently, a one unit increase in relationship quality was associated with 1.85 higher odds of being in the High PWB profile compared to the Low and 1.56 higher odds compared to the Low-Moderate profile.

Comparing cancer types using prostate cancer as the reference group there were no differences between cancer type and PWB profile for reproductive, skin, or other cancer compared to prostate except for skin cancer for the Low-Moderate profile. More specifically, compared to prostate cancer, individuals with skin cancer had a marginally ($p = .072$) lower odds ($b = -0.86$, $SE = .48$, $OR = 0.42$) of being in the Low-Moderate PWB profile compared to the High PWB profile. That is, compared to prostate cancer, individuals with skin cancer had 2.38 higher odds of being in the High PWB profile compared to the Low-Moderate profile. No differences between the High-Moderate and High PWB profiles were found.

Physical and Mental Health Covariates

Higher levels of physical and mental health were associated with lower odds of being in the Low ($b = -0.41$, $SE = .21$, $OR = 0.67$; $b = -1.31$, $SE = .27$, $OR = 0.27$) and Low-Moderate (b

= -0.32, $SE = .16$, $OR = 0.73$; $b = -1.00$, $SE = .17$, $OR = 0.37$) PWB profiles compared to the High PWB profile. That is, individuals that reported higher levels of physical health reported 1.49 times higher odds of being in the High PWB profile compared to the Low and 1.37 times higher odds compared to the Low-Moderate profile. Similarly, individuals that reported higher levels of mental health reported 3.70 times the odds of being in the High PWB profile compared to the Low and 2.70 times the odds compared to the Low-Moderate profile. Since significant others are a large part of any intimate relationship and can affect the well-being of their partners we also assessed the physical and mental health status of spouses and partners. Higher levels of mental health of spouses and partners were associated with lower odds of being in the Low ($b = -0.83$, $SE = .24$, $OR = 0.44$) and Low-Moderate ($b = -0.41$, $SE = .20$, $OR = 0.67$) PWB profile compared to the High PWB profile, but not spouse's or partner's physical health. That is, individuals that reported higher levels of spouse's or partner's mental health reported 2.27 times higher odds of being in the High PWB profile compared to the Low PWB profile and 1.49 times higher odds compared to the Low-Moderate PWB profile. No difference between the High-Moderate and High PWB profiles were found.

Sexual Health Covariates

Three features of sexual health that included emotional intimacy, pain and discomfort, and sexual pleasure were examined to understand their associations with the various PWB profiles. Emotional intimacy ($b = -0.87$, $SE = .26$, $OR = 0.42$) was associated with lower odds of being in the Low PWB profile compared to the High PWB profile. That is, individuals that reported higher level of emotional intimacy had 2.38 higher odds of being in the High PWB profile compared to the Low PWB profile. Pain and discomfort ($b = 0.54$, $SE = .32$, $OR = 1.72$) was associated with higher odds of being in the low PWB profile compared to the High PWB

profile, although, the effect was marginally significant ($p = .084$). Sexual pleasure ($b = -0.66$, $SE = .28$, $OR = 0.52$) was associated with lower odds of being in the Low-Moderate PWB profile compared to the High PWB profile. That is, individuals that reported higher levels of sexual pleasure had 1.92 higher odds of being in the High PWB profile compared to the Low-Moderate PWB profile. No difference between the High-Moderate and High PWB profiles were found.

CHAPTER 5: DISCUSSION

The findings in the current study underscore the importance of sexual health in relation to psychological well-being (PWB) among cancer survivors. The purpose of the study was to understand individual and health (i.e., sexual health) characteristics of a sample of cancer survivors grouped by individual patterns of PWB (i.e., Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, Self-Acceptance). While most survivors were doing well (65.5%), a portion of survivors are not flourishing in comparison to their peers.

Using Latent Profile Analysis, four profiles of PWB were identified and include the *High* (29.5%) profile that had the highest rates of PWB; the *High-Moderate* (36%) that had the second highest rates of PWB; the *Low-Moderate* (22.5%) that had low rates of PWB; and the *Low* (12%) profile that had the lowest rates of PWB. Overall, findings showed that individuals in the High PWB profile reported higher levels of intimacy, less pain and discomfort, and more sexual pleasure than those in the low-profile groups (i.e., Low and Low-Moderate). There were no differences found between the High and High-Moderate PWB profiles. In terms of other health characteristics higher levels of physical and mental health were associated with the High PWB profile. Interestingly, in terms of spouse's or partner's health, spouse's or partner's mental health was associated with higher PWB profiles but not spouse's or partner's physical health.

In general, survivors in the sample (N = 558) were more likely to be older, white women, within an average income of \$40,000. In addition, higher annual household income was associated with the High PWB group compared to the low groups but not age or sex. There were several cancer types in the data that were grouped based on the number of survivors within each cancer type and past literature. For example, reproductive cancers that include breast, cervical,

ovarian and uterine were combined because of cancer and treatment on female reproductive organs (U.S. Department of Health & Human Services, 2017). Prostate cancer was used for the male reproductive cancer group. Skin or melanoma and other cancers types were combined based on frequency. However, when comparing cancer types, no differences were found except skin cancer had lower odds of being in the Low PWB profile compared to prostate cancer.

Profiles of Psychological Well-Being among Cancer Survivors

The identification of four profiles (High, High-Moderate, Low-Moderate, and Low) supports the first hypothesis that more than one PWB profile would emerge in the data and is consistent with previous studies. Studies have examined profiles of PWB within other health characteristics (e.g., depression, self-rated health) and found between three and five PWB profiles (Bhullar et al. 2014; Ryff, Radler & Friedman, 2015; Wood, & Joseph, 2010). These studies used various samples including college students and middle age to older adults to examine PWB profiles and associations with depression (Bhullar et al. 2014; Wood, & Joseph, 2010) and using the general MIDUS dataset (Ryff, Radler & Friedman, 2015). However, two of these studies subjectively grouped individuals based on arbitrary cutoffs that grouped individuals into high, medium, and low groups, typically using plus or minus one standard deviation or quartiles (Wood, & Joseph, 2010; Ryff, Radler & Friedman, 2015). This approach is subjective and does not account for the possibility of other configurations of groups or uncertainty in group assignment. To our knowledge, our study is the first study to examine PWB profiles within a sample of cancer survivors using statistical methods to derive the number and characteristics of the PWB profiles using LPA. Allowing the data to empirically derive the PWB profiles is more robust than arbitrarily choosing cut points; further, this method is also ideal for demonstrating the multidimensional properties of the PWB scale. For example, considering the unique pattern

of the six PWB constructs across the groups, survivors in the low profiles (Low-Moderate and Low PWB profiles) showed particularly low levels of environmental mastery compared to the high profiles (High-Moderate and High PWB profiles). Further, the Low PWB profile also showed particularly low levels of self-acceptance. It is interesting to note that while more than one profile was found there was not a middle group based on PWB as found in other studies that use arbitrary cut points (Ryff, Radler & Friedman, 2015). Survivors in this sample were either doing well (High and High-Moderate PWB profile) and those that are not doing well (Low and Low-Moderate PWB profile).

Comparing Demographic and Health Differences of Psychological Well-Being Profiles

Once profiles were identified we examined various demographic and health covariates, particularly sexual health, to understand differences between the four PWB profiles.

Demographic Characteristics

Interestingly, when comparing cancer types the only difference was between skin and prostate cancer, such that, prostate cancer had higher odds of being in the Low-Moderate PWB profile compared to the High PWB profile. While other studies that examine cancer types have found differences in well-being, these studies were mostly on one cancer type (e.g., breast, or thyroid) (Carpenter, Brockopp, & Andrykowski, 1999; Cordova, Cunningham, Carlson & Andrykowski, 2001; Costa & Pakenham, 2012) or using as a comparative sample that compared survivors to a matched control (Costanzo et al., 2012). It could be the case that in comparison to other cancer types within this sample differences were only found for prostate and skin/melanoma because the prognosis and treatment types of the two cancers differ. Impact from treatments may have different implications on survivors depending on the type of cancer, thus differentially impacting individual PWB. However, by controlling for cancer types our results

show that regardless of the type of cancer sexual health is significantly associated with higher PWB.

In addition, having high relationship quality was associated with higher odds of being in the High PWB profile compared to the Low and Low-Moderate PWB profiles. This is consistent with past research that has found associations between psychosocial factors such as relationship satisfaction and PWB and sexual satisfaction (Thomas, Hess, & Thurston, 2015). This finding highlights the importance of relationship quality on higher rates of PWB.

Health Characteristics

In terms of physical and mental/emotional health of the survivor, results were consistent with other studies showing that individuals who reported lower levels of physical and mental health had higher odds of being in the Low or Low-Moderate profiles compared to the High PWB profile. Said differently, individuals who reported better health were more likely to have higher PWB. Past research has linked psychological well-being with a variety of health outcomes, including inflammation (Friedman et al., 2007; Morozink et al., 2010), and cardiovascular risk (Boehm & Kubzansky, 2012; Surtees et al., 2006). In addition, Keyes (2005) reported that mentally healthy adults, those with high levels of multiple aspects of well-being and limited psychological distress, had few chronic conditions compared to adults lacking well-being across all ages. Our study and these past studies suggest that efforts aimed at improving individual physical and mental health may find success in improving PWB among a variety of patients contending with chronic illnesses.

Since significant others can be a large part of any intimate relationship and can affect the well-being of their partners we also assessed the physical and mental health status of the cancer survivor's spouse and partners. An interesting finding was that spouse's and partner's mental

health was associated with being in a higher PWB profile but not physical health. Other studies have found that in older adults, loss of physical health and quality of relationship can result in lower well-being (Vanhoutte & Nazroo, 2014). More work is needed to examine the association between spouse's/partner's physical health and individual rates of PWB. However, considering information about the spouse or partner's physical and mental/emotional health can provide further insights into one's level of PWB.

Sexual Health Characteristics

Findings indicate that having higher sexual pleasure, emotional intimacy and lower pain and discomfort is associated with having higher well-being. As such, one option to improve cancer survivors PWB is to focus on enhancing individual levels of sexual pleasure, emotional intimacy and ways to reduce pain or discomfort. These findings are consistent with previous studies showing that sexual health (e.g., higher desire, more frequent sexual activities and fewer functional problems) is significantly associated with higher rates of subjective well-being (Lee et al., 2016). Just as sexual well-being was positively associated with both physical and mental health (Laumann et al, 2006), sexual dysfunction has been found to be highly associated with negative experiences in sexual relationships and overall well-being (Laumann, Paik, Rosen, 1999) as well as decrements in health-related quality of life (HRQOL) (Zebrack et al., 2009).

Our study is the first study to examine profiles of PWB in terms of sexual health and highlights an understudied area that could be used in practice to significantly improve individual levels of PWB. For example, sexuality and intimacy have been found to reduce emotional distress and improve psychosocial response to a cancer diagnosis (Hordern, & Currow, 2003; Wimberly et al., 2005) thus resulting in improvements in the survivor's overall quality of life.

Future studies should continue to examine the associations between sexual health and PWB among various populations to confirm and extended the current findings.

Seldom are these alterations in sexuality and sexual health isolated to a single variable and neither should interventions aimed at improving sexual health and well-being. There is a need for a more nuanced understanding of how PWB is related to various aspects of sexual functioning. Our findings suggest that treatment efforts should incorporate sexual health, particularly around enhancing intimacy and pleasure within cancer treatments. Despite what we know about how sexual functioning and satisfaction is affected by cancer and cancer treatments, practitioners remain reluctant to discuss sexual health in post-treatment efforts (Ussher et al., 2013). Barriers to communication, lack of training, preparation, and time to discuss sexuality with survivors have all been cited reasons for the lack of sexual health focus in treatment efforts (Park et al., 2009; Bober et al., 2009). However, survivors have practical questions about the effects post-treatment that are frequently unanswered and there is little to no direct discussion with doctors about sexual health issues (Hendren et al., 2005).

By establishing a broader view of sexuality and intimacy may empower individuals and couples to experience success to gradually resuming more intense sexual connectedness (Syme, Mona, & Cameron, 2013). Psychoeducation is one strategy that can be used to inform survivors and partners about cancer and sexuality, as many are unaware of the impact of cancer (e.g., lack of intimacy). In addition, clinicians tend to focus on disease outcomes and lack the experience to handle more intimate issues, and hence, certain problems such as intimacy and sexuality have been largely neglected (Hordern & Street, 2007). Reinitiating sexual intercourse may not necessarily be the goal of treatment and thus extending the couple's definitions of sexuality and intimacy within the context of chronic illness, as intimacy can be achieved without sex,

erections, or orgasms (ACS, 2018; Kukkonen, & Sarin, 2011) is needed by clinicians. In addition, partners of survivors can be supportive by offering physical closeness and touching when the survivor's energy is low, willing to try more gentle activities and new positions that feel good to both the survivor and partner, as well as kindness, affection, and respect (ACS, 2018).

It is recommended by the American Society of Clinical Oncology (ASCO), and American Cancer Society (ACS) that individual or couples counseling be offered for those wishing to improve relationship or intimacy issues (ASCO, 2017; ACS, 2018). In addition, and/or in conjunction with counseling other recommendations are communication interventions, scheduling intimacy dates without sexual intercourse, and sensate focus foreplay with gradual progression toward sexual intercourse (Carter et al., 2017).

Sensate focus was developed as a skills-based couples' therapy by Masters and Johnson (1966) that increases awareness of sexually pleasurable regions for each partner and emphasizes communication of each other's preferences and pleasurable experiences via a sequence of body-touching exercises. Both partners touch, massage, and caress their partner's body but avoid any erogenous areas and sexual activity. The process gradually advances to genital touching and massage and progress until intercourse is permitted, but only when both are in agreement. This process can take many weeks and includes frequent homework assignments. Engaging in these exercises allows couples to experiment and explore sexual activities that did not involve intercourse as well as practice communicating openly with one another regarding their experiences (Reese, Keefe, Somers, & Abernethy, 2010). In addition, sex education can be included and when tailored to the survivor's cancer can aid in teaching couples about the sexual changes that have occurred in the survivor's body and how best to deal with them (Kukkonen, &

Sarin, 2011). Further, relaxation- based or mindfulness training can facilitate the experiencing of pleasure (Brotto, Basson, and Luria, 2008).

There is a crucial need to take an integrative approach to managing sexual dysfunction and in turn promoting sexual well-being with cancer survivors. Consistent with our understanding of sexuality as a multidimensional construct, delivery of information about sexuality is optimized when it is not only targeted to a survivor's physical needs but is also congruent with each survivors' experience of self-efficacy, and the cultural context (Bober & Varela, 2012). One way to improve a person's well-being is through incorporating and understanding the multifaceted needs of the individual best suited for promotion of health assets. One such promotion could be that of using mindfulness strategies aimed at present-moment awareness and graduated exposure to increasingly intimate behaviors while practicing relaxation (Brotto, Basson, and Luria, 2008; Gallo-Silver, 2000). This in conjunction with traditional sex therapy practice result in a sensual mindfulness intervention (Gallo-Silver, 2000; Mona et al., 2011). For example, a study incorporated sensual mindfulness into a psychoeducational group for female cancer survivors to increase sexual arousal and found that the intervention increased women's ability to experience pleasure and to tune into existing, but previously ignored, genital arousal (Brotto, Basson, and Luria, 2008). More practical efforts that focus on improving the various aspects of sexual health among individuals with chronic diseases are needed as sexual health is a major part of PWB and overall healthy living.

Limitations

The current study has several limitations that should be noted. To begin, all assessments were self-reported and subject to reporter bias. Studies that incorporate multiple reporters or physical and behavioral measures could provide further and more robust insight. The findings

were also cross-sectional and do not account for changes over time. Studies that incorporate longitudinal designs are needed to assess the continuity or discontinuity in PWB over time. In addition, most of the sample were older White females which limit the generalizability of the findings. More work is needed that examines PWB profiles among a more diverse sample to better understand if the current findings generalize to other races. Although we controlled for cancer type, we were unable to examine PWB profiles for specific cancer types due to low sample sizes within cancer type. Future studies should examine PWB profiles within specific cancer types. However, in the current study it appears that PWB is rather consistent across cancer types given the lack of significant differences between cancer types and PWB profiles. Further, the current study only examined three sexual health covariates. Other aspects of sexual health should be considered in future work to better understand nuance differences among the different dimensions of sexual health.

Conclusions

The goal of the current study was to examine the association between sexual health with different profiles of PWB. Findings indicate that among cancer survivors, sexual pleasure and intimacy are key aspects to consider when understanding a person's PWB. In order to understand what is working well we needed to understand what allows people to flourish under adverse conditions like cancer. In line with a positive health approach, this study provides a more nuanced understanding of human flourishing (e.g., PWB) and how sexual health can aid even during adversity. Future studies should further examine the various factors that influence positive functioning (e.g., relationship quality, sexual pleasure, etc.) to see whether these associations are consistent over time and could be translated into treatment strategies. Together the current study

underscores the pressing need to incorporate sexual health treatments among patients with chronic illness in an effort to improve patient PWB and overall quality of life.

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APPENDIX A: TABLES AND FIGURES

Table 1: Summary of Dimensions and Sample Questions from Ryff's (1989) Psychological Well-Being Scale

Dimensions	Description	Sample Questions from Measure
Autonomy	Independent in thought and action whilst living in accord with personal convictions	<i>I tend to worry about what other people think of me</i> <i>I judge myself by what I think is important, not by the values of what others think is important</i>
Environmental Mastery	Ability to manage complex environments to suit personal needs and values	<i>I have difficulty arranging my life in a way that is satisfying to me</i> <i>I have been able to build a living environment and a lifestyle for myself that is much to my liking</i>
Personal Growth	Continue to grow and develop making use of personal talents and potential	<i>I gave up trying to make big improvements or changes in my life a long time ago</i> <i>I think it is important to have new experiences that challenge how you think about yourself and the world</i>
Positive Relations with Others	Established quality ties with others and secure connections with significant others	<i>I have not experienced many warm and trusting relationships with others</i> <i>Most people see me as loving and affectionate</i>
Purpose in Life	Pursuing meaningful goals with a sense of purpose and direction in life	<i>I sometimes feel as if I've done all there is to do in life</i> <i>I have a sense of direction and purpose in life</i>
Self-Acceptance	Positive evaluations of multiple aspects of oneself and one's past behaviors and choices both good and bad	<i>In many ways I feel disappointed about my achievements in life</i> <i>In general, I feel confident and positive about myself</i>

Table 2: Components of Sexual Health, Summary and Definition and Questions about Sexual Health from MIDUS (1989) Survey

Sexual Health Components	Description and Definition	Questions from MIDUS
Sexual Pain and Discomfort	Pain or discomfort when engaging in sexual interactions	<i>How often do you experience pain or discomfort in your sexual interactions?</i>
Intimacy	Closeness that allows shared feelings, trust and caring	<i>To what extent would you say that your sexual relationship(s) include emotional intimacy?</i>
Sexual Pleasure	A range of enjoyable experiences that derive from any erotic interaction and feel good	<i>How often do you experience pleasure in your sexual interactions</i>

Table 3: Means (or *n*) and Standard Deviations (or %) of All Variables

	Means (or <i>n</i>)	SD (or %)
Demographics		
Sex		
Female	331	59.3%
Male	227	40.7%
Age in years	63.78	11.76
Annual Household Income	40.74	14.69
Race		
White	527	94.4%
Nonwhite	31	5.6%
Relationship Quality	8.37	1.98
Type of Cancer		
Prostate Cancer	68	12.2%
Breast, Cervical, Ovarian, and Uterine Cancers	163	29.2%
Skin Cancer/Melanoma	212	38.0%
Colon, Lung, Lymphoma/Leukemia, and Other Cancers	160	28.7%
Psychological Well Being		
Autonomy	37.13	6.82
Environmental Mastery	38.12	7.42
Personal Growth	37.90	7.23
Positive Relations with Others	40.74	7.07
Purpose in Life	37.52	7.05
Self-Acceptance	37.75	8.46
Sexual Health		
Sexual Pleasure	3.13	0.86
Emotional Intimacy	3.21	0.91
Pain/discomfort	1.32	0.64
Physical and Mental Health		
Physical Health	3.24	1.09
Mental/Emotional Health	3.70	0.94
Spouses Physical Health	2.29	1.13
Spouses Mental/Emotional Health	2.82	1.06

Note. Cancer types sum to larger than the total sample because some individuals report more than one cancer type.

Table 4: Model Fit Indices for 1 through 5 Latent Profile Models

Classes	-2LL	AIC	BIC	CAIC	AWE	LMRT <i>p value</i>	BLRT <i>p value</i>	Entropy
1	22874.61	22898.61	22950.50	22962.50	23062.39	-	-	1
2	21443.68	21481.68	21563.84	21582.84	21741.01	.001	.001	.912
3	21070.38	21122.38	21234.81	21260.81	21477.25	.001	.001	.873
4	20940.52	21006.52	21149.22	21182.22	21456.93	.004	.001	.810
5	20870.73	20950.73	21123.71	21163.71	21496.68	.322	NC	.816

Note. -2LL = Negative 2 log likelihood; AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria; CAIC = Consistent Akaike Information Criteria; AWE = Approximate Weight of Evidence Criterion; LMRT = Lo-Mendell-Rubin Test; BLRT = Bootstrapped Log Likelihood Ratio Test; NC= No Convergence.

Table 5: Psychological Well-Being Means by Latent Profile ($N = 558$)

Variable Means	Class 1: Low (12%)	Class 2: Low- Moderate (22.5%)	Class 3: High- Moderate (36%)	Class 4: High (29.5%)
Autonomy	28.53	34.63	38.06	41.33
Environmental Mastery	25.26	32.92	39.91	45.02
Personal Growth	28.67	33.41	38.75	43.94
Positive Relations with Others	29.86	36.40	42.18	46.63
Purpose in Life	27.67	32.31	38.94	43.67
Self-Acceptance	22.04	32.64	39.71	45.54

Table 6: Estimates, Standard Errors, and Odds Ratios of All Variables Examining Associations with Profiles of Psychological Well-Being

Variables	Low			Low-Moderate			High-Moderate		
	Est.	SE	OR	Est.	SE	OR	Est.	SE	OR
Demographics									
Age	-0.02	0.02	0.98	0.01	0.01	1.01	0.01	0.01	1.01
Sex	0.10	0.49	1.10	-0.07	0.36	0.93	0.02	0.36	1.02
SES	-0.04**	0.02	0.96	-0.04*	0.02	0.97	-0.01	0.02	0.99
Relationship Quality	-0.61***	0.13	0.54	-0.44***	0.12	0.64	-0.17	0.13	0.85
Cancer Type									
Reproductive Cancer	-1.13	0.95	0.32	-0.97	0.61	0.38	0.33	0.62	1.39
Skin Cancer	-0.89	0.83	0.41	-0.86 [†]	0.48	0.42	0.29	0.52	1.33
Other Cancer	-0.59	0.83	0.56	-0.28	0.49	0.76	0.14	0.55	1.16
Physical and Mental Health									
Physical Health	-0.41*	0.21	0.67	-0.32*	0.16	0.73	-0.06	0.15	0.94
Mental Health	-1.31***	0.27	0.27	-1.00***	0.17	0.37	-0.54	0.17	0.59
Spouses Physical Health	0.14	0.24	1.15	0.12	0.19	1.13	-0.17	0.16	0.84
Spouses Mental Health	-0.83***	0.24	0.44	-0.41*	0.20	0.67	-0.06	0.19	0.95
Sexual Health									
Emotional Intimacy	-0.87***	0.26	0.42	-0.31	0.25	0.73	-0.29	0.26	0.75
Pain and Discomfort	0.54 [†]	0.32	1.72	-0.53	0.39	0.59	-0.33	0.32	0.72
Sexual Pleasure	-0.38	0.30	0.68	-0.66**	0.28	0.52	-0.32	0.27	0.73

Note. “High” Psychological Well-Being is the reference profile. Prostate cancer is the reference group for cancer type and male is the reference group for sex.

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 1: Conceptual Latent Profile Model with Demographic and Health Covariates

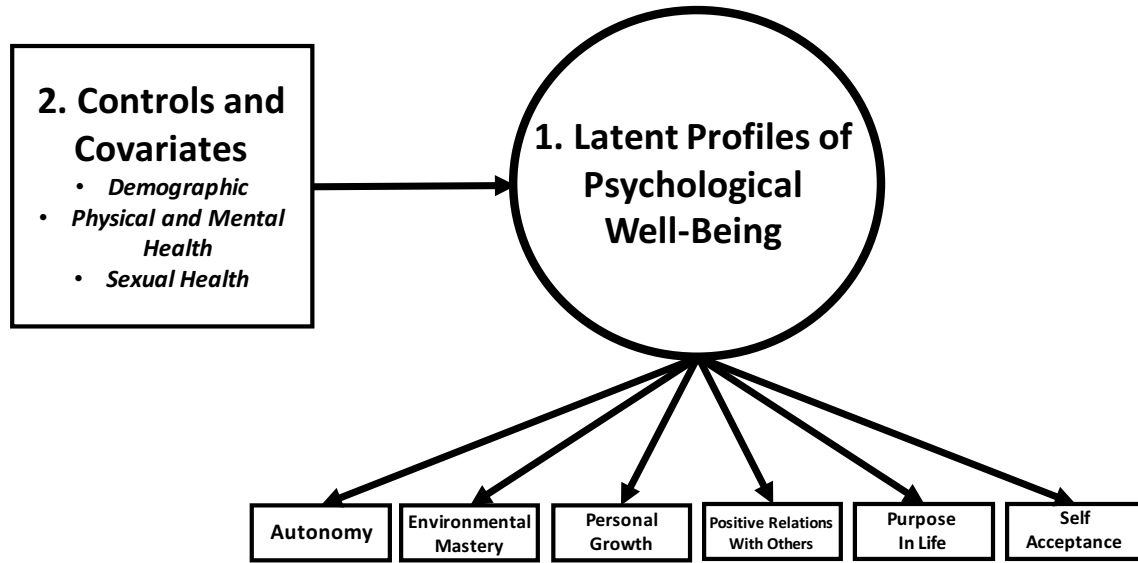


Figure 2: Plotted Psychological Well-Being Means for each Latent Profile

