

BODY IMAGE AND QUALITY OF LIFE AMONG MEN WITH PROSTATE
CANCER

by

Joanne Mary Harrington
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DEDICATION

To oncology patients everywhere

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ABSTRACT

It is estimated that more than 218,000 men will be diagnosed with prostate cancer in the year 2007. With a mean age at diagnosis of 72, and extended long-term survival, prostate cancer represents a significant health problem among older men. Despite the fact that the treatment for prostate cancer has significant effects upon one's physical appearance and functional ability, there exists a gap in the literature regarding body image in men with prostate cancer. Additionally, there is a large gap in our knowledge of the relationship of body image and QOL in men with prostate cancer.

The purpose of this study was to describe changes in body image and quality of life among men with prostate cancer, to describe the relationship between the two, and to explore the differences in body image and quality of life related to treatment, age, duration of therapy and body mass index.

The sample consisted of one hundred and thirty-two older men (\geq age 60) with prostate cancer, recruited from the oncology and urology out-patient departments at an urban Veterans Affairs Medical Center. The participants completed 2 established questionnaires, the Body Image Scale and the Quality of Life Index Cancer Version. Descriptive and inferential statistics were used in the analysis.

For purposes of analysis, the sample was grouped according to treatment with ADT as part of therapy for prostate cancer. The ADT-naive group composed 34.1% of the sample ($n = 45$); the ADT group composed 65.9% of the sample ($n = 87$). Whether or not one received ADT was correlated with body image change: those men who received ADT had a greater perception of negative change. There was, however, no difference in

quality of life between men who received ADT and men who did not. Neither age nor duration of therapy had any relationship with the perceptions of change in body image or quality of life. A significant negative correlation was demonstrated between body image change and quality of life overall, and with each of the domains.

CHAPTER I: BACKGROUND AND CONCEPTUAL FRAMEWORK

The purpose of this study was to describe changes in body image and quality of life among men with prostate cancer, to describe the relationship between body image and quality of life in men with prostate cancer, and to explore differences in body image and QOL related to treatment, age, duration of therapy and body mass index among men with prostate cancer. It is estimated that more than 218,000 men will be diagnosed with prostate cancer in 2006 (American Cancer Society [ACS], 2007). The mean age at diagnosis is 72 years (National Cancer Institute [NCI], 2006b) making this a much more common health problem among elderly men than younger men. The majority of men diagnosed and treated for prostate cancer survive for many years (NCI, 2006b). However, hormonal manipulation, a mainstay of treatment for prostate cancer, results in decreased testosterone and body feminization in men of an age when they are likely already experiencing age-related physical and psychological changes as they transition into their later years of life. Despite the high number of men affected by prostate cancer, the feminization of body characteristics associated with treatment, and the long-term survival of many men undergoing ADT, there is little research focusing on how these experiences interact with overall quality of life. Nurses participate in many phases of follow-up care for men with prostate cancer, but have little research foundation for enhancing quality of life among prostate cancer survivors. Results of this investigation

may provide a foundation for interventions to improve quality of life among men with prostate cancer.

This chapter provides background information about the pathophysiology and diagnosis of prostate cancer, treatment for prostate cancer, and the physical changes associated with ADT for prostate cancer. The last section introduces the conceptual model for the study, provides definitions of body image and quality of life, and presents the problem statement and study aims.

Overview of Prostate Cancer

Prostate cancer is the most common type of cancer among men in the United States (with the exception of skin cancer). The American Cancer Society estimates that there will be greater than 218,000 new cases of prostate cancer in the United States in 2007, representing 33% of all new cancer diagnoses among men in that year. A disease of elderly men, the probability of developing prostate cancer increases with age: rising from 1 in 38 at ages 40-59, to 1 in 14 at ages 60-69, and to 1 in 7 at ages 70 and older. Though the numbers of men affected are almost overwhelming, at 1 in 6, only 1 in 34 men will die of the disease (ACS, 2007).

Though prostate cancer represents 33% of all cases of cancer in men, death from prostate cancer represents only 10% of the total cancer deaths. It is estimated that 27,050 men will die of prostate cancer in the year 2007 (ACS, 2007). The difference between incidence and mortality is large, meaning those men with prostate cancer compose a significant percent of the cancer survivor population. In addition, the mortality rates are declining, with survival improving steadily (ACS, 2007; Jemal et al., 2006). The 5 year

survival rate increased from 67% during the years 1974 and 1976, to 100%, during the years 1995 and 2001 (Jemal et al., 2006).

In conclusion, given the median age of diagnosis (72 years), the probabilities of developing prostate cancer over a lifetime (1 in 6), decreasing mortality rates and increasing long-term survival, prostate cancer must be considered a chronic illness that threatens the health and well-being of a substantial proportion of elderly men in this society (Lepore, Eton, Helgeson & Schulz, 2003). Survival is extended, with new cases far exceeding deaths each year (Jemal et al., 2006).

Pathophysiology of Prostate Cancer

The prostate is a walnut-sized gland located in front of the rectum and under the bladder. This gland functions as part of the reproductive system in the male, responsible for the production of seminal fluid. The testicles, and to a lesser extent the adrenal glands, are responsible for the production of testosterone (NCI, 2005). The development and maintenance of this gland requires a functional androgen-signaling axis. Components of this axis include testicular synthesis and transport of testosterone to target tissues, conversion of testosterone to 5- α dihydrotestosterone (DHT), maturation of the androgen receptor (AR) and the subsequent transcriptional regulation of AR target genes. Function of this axis is also necessary for prostate cancer development (Buchanan, Irvine, Coetzee & Tilley, 2001).

Support for the role of androgens in the development of prostate cancer comes from several sources: (a) eunuchs, prepubertal castrates, and men with congenital abnormalities of androgen metabolism do not develop either benign prostatic hypertrophy

(BPH) or prostate malignancy; and (b) surgical or medical androgen blockade results in involution of BPH and carcinoma (Haas & Sakr, 1997).

The AR appears to be involved in genetic predisposition, disease progression, and the development of resistance to androgen deprivation therapy (Buchanan et al., 2001), although the exact mechanisms remain elusive (Chmelar, Buchanan, Need, Tilley & Greenberg, 2006). Polymorphism (DNA sequence changes that do not affect protein function) of the AR gene has been demonstrated by variability in the lengths of the codon CAG. Codons, which are made up of 3 base pairs of nucleotides, determine the sequence of amino acids in protein synthesis. CAG is a codon believed to have implications in prostate cancer: shorter CAG repeats have an increased sensitivity to androgens. In fact, the length of the CAG repeat mirrors the susceptibility to prostate cancer: African American men have the highest incidence of prostate cancer, and the shortest CAG repeats; Asian men have a lower risk of prostate cancer and the longest CAG repeats (Buchanan et al., 2001; Lopez-Otin & Diamandis, 1998; Robbins & Cotran, 2005).

Risk factors for the development of prostate cancer include age, race and family history (NCI, 2006a). Prostate cancer, rarely seen in men younger than age 40 (NCI, 2006a), increases continually with age (Lopez-Otin & Diamandis, 1998). In fact, prostate cancer increases faster with age than any other malignancy (Haas & Sakr, 1997). Lopez-Otin and Diamandis suggest that this reflects the continuation of testicular function in males throughout life. Certainly, age is permissive for an accumulation of genetic lesions in a variety of oncogenes and tumor suppressor genes.

Race also is a risk factor in the development of prostate cancer. In addition to disproportionately affecting the elderly, both the incidence and mortality reveal a disproportionate impact by race and ethnicity. Age standardized incidence and death rates, per 100,000, in the years 1998-2002 reveal the highest incidence and death rate among African American men, at 272, and 68, respectively; white men at 169 and 27.7; Hispanic-Latino men at 141.9 and 23; Asian American/Pacific Islanders at 101.4 and 12.1; and American Indian/Alaskan Natives at 50.3 and 12.1 (Jemal et al., 2006).

As noted in the previous discussion, when compared with Caucasians, African Americans have a incidence and mortality that is 47% and 128% higher, respectively, even when compared with Caucasians at an identical stage of presentation (Haas & Sakr, 1997). How much of this is explained by polymorphisms of the AR gene is unknown.

Family history is the third of three risk factors identified by the National Cancer Institute. Though familial clustering of prostate cancer has been reported, only 5-10% of cases are believed to be secondary to prostate cancer susceptibility genes. The risk of prostate cancer increases in men with a family history of breast cancer, due to the presence of the mutations BRCA1 and BRCA2, susceptibility genes for breast cancer (NCI, 2006a). Dietary factors have also come under increased scrutiny in the development of prostate cancer, with the evidence supporting a link between a high fat diet and the development of prostate cancer (Lopez-Otin & Diamandis, 1998). Likely a factor, circulating androgen levels are altered by dietary patterns.

In conclusion, the etiology of prostate cancer is multifactorial, under the control of cellular, genetic and biochemical events (Haas & Sakr, 1997); However, the AR

appears to be "...involved in all aspects of the disease, from initiation to development of treatment resistance" (Buchanan et al., 2001, p. 207).

Treatment Options

Treatment decisions are based upon the stage, or extent of the prostate cancer, the age of the man, and his associated co-morbidities. Two systems in common use for the staging of prostate cancer include the older Jewett system and the newer American Joint Committee on Cancer (AJCC). This latter system was defined in 1997, and updated in 2002. It is clinically useful as a measure to stratify newly diagnosed patients, employing Tumor-Node-Metastasis (TNM) system commonly used in other malignancies.

Additionally, the AJCC staging system includes pathologic grade of the tumor, expressed as a Gleason score. Gleason scores, ranging from 1-10, represent the degree of differentiation among the malignant cells that are present in a biopsy. The greater the Gleason score, the less differentiated the tumor; poorly differentiated tumors behave more aggressively, and thus portend a poorer prognosis. Tumors are staged from 1 through 4, with increasing stage indicative more extensive disease, and a poorer prognosis. Please see Appendix D for components (TNM, Histopathologic grade) of the AJCC staging system.

The treatment options include surgery, radiation therapy, hormonal therapy or watchful waiting (NCI, 2005). Candidates for surgical treatment include patients diagnosed as Stage I or II, in good health, and younger than age 70. Complications include urinary incontinence, urethral stricture, impotence, and the morbidity associated with general anesthesia and a major surgical procedure. The incidence of disease

recurrence is related to operative findings: extracapsular extension and positive margins increase the risk of recurrence. Cryosurgery, a newer surgical technique, involves less surgical morbidity, however, the long-term outcomes are not as established as either prostatectomy or radiation therapy (NCI, 2006d). This procedure involves the destruction of prostate cancer cells by intermittent freezing of the tissue with cryoprobes, followed by thawing. Complications of this procedure include bladder outlet injury, urinary incontinence, sexual impotence, and rectal injury.

Radiation therapy is offered to patients staged I, II or III. Patients determined to be poor surgical candidates, due to the presence of co-morbidities, may be offered radiation as definitive therapy. Similar to surgery, long term results are dependent upon the stage of disease. And again, this treatment modality is not without significant complications: acute cystitis, proctitis, and enteritis. Potency, initially preserved, may diminish over time. Interstitial brachytherapy may be offered to select patients -- those with low Gleason scores, low PSA, and stage T1 and T2 tumors. As with cryosurgery, the evidence as to efficacy remains undetermined at this time (NCI, 2006d).

Careful clinical observation, or watchful waiting, may be offered to asymptomatic patients of advanced age, or in those for whom co-morbidities preclude more aggressive therapy. Given the indolent nature of many prostate cancers, and the toxicities associated with therapy, this may be an acceptable and reasonable option for many men. As reported by the NCI, a retrospective analysis of the outcomes of men opting for watchful waiting demonstrated a 10-year disease specific survival of 94% for Gleason 2-4 and 75% for Gleason 5-7 tumors (NCI, 2006d).

The final treatment option to be discussed is hormonal therapy (androgen deprivation therapy [ADT], or androgen suppression [AS]). This may be administered as neo-adjuvant therapy for clinically localized disease concurrently with radiation therapy, as adjuvant therapy after the completion of primary therapy, as primary therapy in advanced disease, or after biochemical recurrence and failure of primary therapy (National Comprehensive Cancer Network [NCCN], 2007). Hormonal therapy is designed to interrupt the supply of testosterone to the prostate cancer cell, thus interfering with its growth.

Androgen deprivation therapy. More than 50 years ago, Huggins and colleagues documented the dependence of the prostate gland upon androgens. Androgens are important in growth regulation of the prostate gland, and in the pathogenesis of prostate cancer (Denis & Griffiths, 2000; Rashid, 2004). The mechanism is as follows, and is illustrated in Figure 1.

1. Gonadotropin-releasing hormone (GnRH) is produced by and released from the hypothalamus, to act upon the pituitary gland, stimulating the release of luteinizing hormone (LH).
2. LH stimulates the production of testosterone in the Leydig cells of the testes.
3. Testosterone is released into the circulation where it either remains unchanged, is converted to estradiol, or to dihydrotestosterone (DHT) by the enzyme 5 α -reductase. As occurs commonly in much of the endocrine system, negative feedback loops ensure that the production of testosterone remains regulated (Williams, Hernandez & Thompson, 2005).

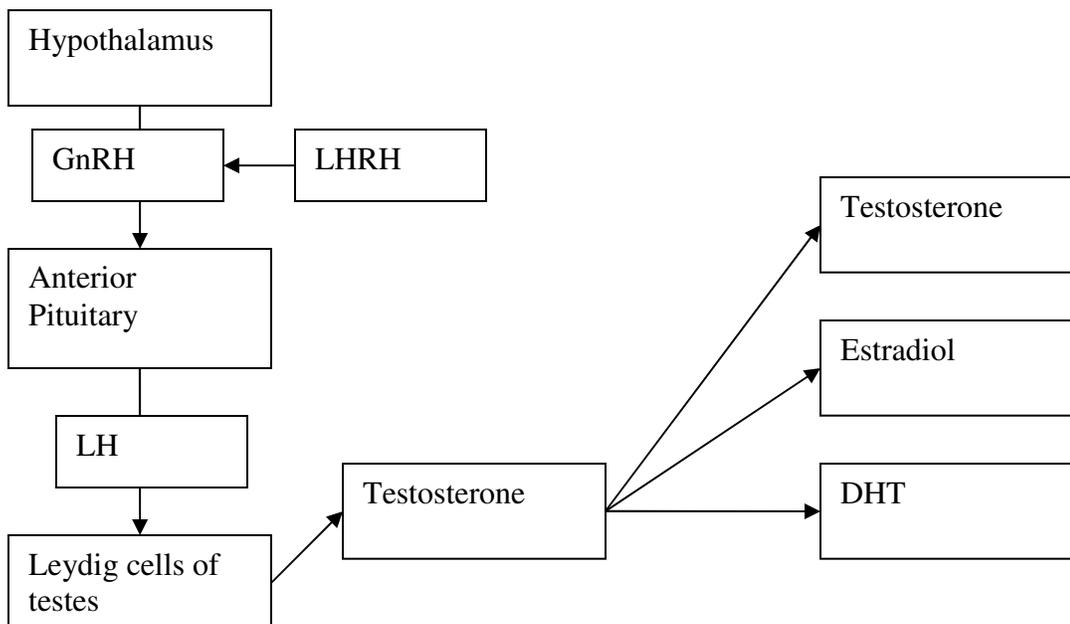


FIGURE 1. Pathway of Testosterone Production and Release

It is through the function of this feedback loop that ADT effectively decreases the production of testosterone. ADT, usually in the form of luteinizing hormone releasing hormone (LHRH), is administered to interrupt the supply of testosterone to the prostate cancer cell (Denis & Griffiths, 2000). The continuous exposure of LHRH agents to GnHR receptors in the anterior pituitary leads to a downregulation of GnRH receptors, with an eventual decrease in LH and thus decreased production of testosterone (Williams et al., 2005). Though this ensures a withdrawal of androgen support to the prostate cancer cell, the iatrogenic hypogonadal state which has been induced leads to significant and deleterious side effects.

ADT, and the resulting decreased systemic level of testosterone, is associated with an increased risk of diabetes, coronary artery disease, myocardial infarction and

sudden cardiac death (Keating, O'Malley & Smith, 2006), osteoporosis (Tan & Tan, 2004; Thompson, Shanafelt & Loprinzi, 2003), vasomotor symptoms, anemia, sarcopenia, gynecomastia, depression, cognitive decline, diminished quality of life, and sexual dysfunction (Sharifi, Gulley & Dehut, 2005; Thompson et al.). In addition to hypogonadal-induced impotence, men receiving ADT experience an additional, and significant deleterious side effect -- a significant reduction in libido (O'Connor & Fitzpatrick, 2005).

Men with prostate cancer, receiving ADT, demonstrated significantly higher body mass index and lower total and free testosterone, as compared with men with prostate cancer not receiving ADT. Additionally, those receiving ADT had a higher prevalence of metabolic syndrome, believed secondary to abdominal obesity and hyperglycemia (Braga-Basaria et al., 2006).

Basaria et al. (2002) examined the effects of long-term (greater than 12 months) ADT in three groups of men: (a) 20 men receiving ADT for prostate cancer; (b) 18 age-matched men with prostate cancer, not receiving ADT; and (c) 20 healthy and ambulatory age-matched controls. Those receiving ADT demonstrated significantly lower bone mineral density (BMD), higher fat mass, reduced upper body strength, and poorer sexual function as measured by the Watt's Sexual Function Questionnaire. In addition, the ADT group had lower quality of life (QOL) scores, as measure on Short Form-36 (SF-36).

In another study comparing 3 similar groups (ADT, non-ADT, and healthy controls), those receiving ADT (for at least 12 months) demonstrated a higher body mass index (BMI), increased glucose, insulin, leptin and levels indicative of insulin resistance

(HOMA). These findings indicate an increased risk of the development of insulin resistance and hyperglycemia, risk factors for cardiovascular disease, secondary to ADT (Basaria, Muller, Carducci, Egan & Dobs, 2005).

In an attempt to determine the effects of duration of ADT, Greenspan et al. (2005) evaluated the effects and duration of ADT in 152 men with prostate cancer (30 with acute ADT [< 6 months]; 50 with chronic ADT [> 6 months]; 72 not receiving ADT) and 43 healthy age-matched controls. This prospective study evaluated measures at baseline and at 12 months. Maximal deleterious effects upon body composition and bone mass were noted to occur in the first year of ADT. Findings of this study suggest a role for early preventative treatment to prevent ADT-associated bone loss; additionally, this study may have implications given the trend toward intermittent ADT. Intermittent therapy involves the interruption and restart of ADT over a period of several years, in an effort to decrease the associated deleterious side effects. However, the findings of this study may warrant a closer look at this practice.

In summary, ADT, the mainstay of treatment for metastatic disease (NCI, 2006b), is not without significant, deleterious side effects. ADT contributes to osteoporosis, anemia, loss of muscle mass, weight gain, decrease in high density lipoprotein (HDL) cholesterol and subjective complaints of breast tenderness and enlargement, hot flashes, decreased cognitive function, fatigue, and depression (ACS, 2006; Higano, 2003; O'Connor & Fitzpatrick, 2005). Higano also reports anecdotal clinical experience of loss of penile length or volume in addition to loss of testicular mass in men receiving ADT.

Additionally, men receiving ADT experience significant sexual side effects including decreased libido, and impotence (O'Connor & Fitzpatrick, 2005).

It is expected that the significant functional (impotence), psychological (decreased libido) and physical (decreased muscularity, increased adiposity, gynecomastia, decreased size and volume of penis and testes) effects will have a cogent influence upon body image in men with prostate cancer. There has been little research about how body image in prostate cancer may affect overall QOL, though there is some evidence that there may be a relationship between body changes and QOL among patients receiving therapy for other malignancies (Hopwood, 1993).

Body Image

Definitions of the concept of body image have been influenced by the perspectives of various disciplines, scientists and practitioners (Cash, Morrow, Hrabosky & Perry, 2004; Pruzinsky & Cash, 2002b). Historically, body image was studied within the realm of neuropathology, with focus upon forms of body experience, such as “phantom limb”, “autotopagnosia”, “hemiasomatognosia” and “agosognosia” (Cash, 2004). Schilder, in 1935, is credited with moving the study of body image beyond this narrow focus (Cash, 2004), with a definition of body image as “...the picture of our own body which we form in our mind, that is to say, the way in which the body appears to ourselves” as cited in (Fawcett & Frye, 1980; Price, 1998; White, 2000).

The concept has been expanded, and is considered to include perceptions and attitudes (Gleeson & Frith, 2006). Additionally, body image is described theoretically “...in terms of complexity and multi-dimensionality, and as a conscious and unconscious

human experience informed by historical, cultural, social, individual and biological factors (Gleeson & Frith, 2006, p. 80). Price's (1990) views are concurrent with this perspective, conceptualizing body image as a social process, subject to ongoing negotiation and interpretation. The definition of body image which encompasses multidimensionality, subjectivity and dynamism is that offered by Dropkin (1999): "...the dynamic perception of one's own bodily appearance, function, and sensations as well as feelings associated with this perception. It occurs largely at a subconscious level and is normally regulated by the condition of the body" (p. 310).

Quality of Life

The concept of quality of life (QOL), also, has been influenced by the perspectives of various disciplines, and populations. Correspondingly, the conceptual definition, and dimensions which comprise QOL reflect the differing perspectives. The World Health Organization (WHO) defines quality of life as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, standards, and concerns" as cited in (as cited in Bonomi, Patrick, Bushnell & Martin, 2000, p.1).

Commonly accepted dimensions include physical health, psychological well-being, social or socioeconomic resources, functional ability, spiritual well-being, and satisfaction with life (King, 2006). The definition of QOL used in this study is "...a person's sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her" (Ferrans, 1996, p. 296). Inherent in this definition of QOL is subjectivity, with a focus upon experiences, rather than conditions of life. The

individualistic philosophy is rooted in the notion that quality of life depends upon the unique experiences of each person (Ferrans, 1996). This assumes the importance of individual differences, based upon evaluation of personal satisfaction with one's life. The individualistic philosophy is appropriate to a study of men with prostate cancer, in that each experience is viewed through the lens of one's individual perspective. The experience of cancer is infinitely personal.

Evidence from other populations with cancer and from the limited literature about body image among prostate cancer survivors suggests that negative body image changes related to cancer treatment may result in decreases in overall quality of life in the years during and following treatment. Most of the studies, within the field of oncology, focus on women with breast cancer. The literature demonstrates that women with breast cancer experience negative changes upon their body image secondary to breast cancer and its treatment. In turn, body image has a salient effect upon QOL.

Avis, Crawford and Manuel (2005) evaluated questionnaires completed by young women with breast cancer in an attempt to describe QOL and identify factors associated with impaired QOL in this age group. Over 70% of women expressed unhappiness with their appearance. Body image was related to almost all QOL domains. However, there has been little investigation of perceptions about changes in body image upon quality of life among survivors of prostate cancer.

Problem Statement

Over 218,000 men are diagnosed with prostate cancer each year. ADT is intended to decrease testosterone to castration levels, in order to interrupt the supply of

testosterone to the prostate cancer cell (Denis & Griffiths, 2000). While this leads to tumor regression and symptomatic improvement, the benefits are accompanied by deleterious side effects (NCI, 2006c): the castration levels of testosterone achieved with ADT lead to significant changes in physical appearance. There is little research about the effects of long-term ADT treatment on body image and quality of life among prostate cancer survivors. This concern is reflected in the following quote:

“The body image effects of medical conditions and their treatment have profound quality-of-life consequences for millions of people. As health-care providers, our responsibility is to better understand these effects in order to design effective and efficient treatment programs that enhance quality of life. There is little question that our ignorance about the influence of body image on quality of life helps perpetuate untold amounts of human suffering. It is a noble and pressing challenge to understand and attempt to relieve this suffering.” (Pruzinsky & Cash, 2002a, p. 177).

Purpose of Study and Specific Aims

The purpose of this study was to describe changes in body image and quality of life among men with prostate cancer, to describe the relationship between body image and quality of life in men with prostate cancer, and to explore differences in body image and QOL related to treatment, age, duration of therapy and body mass index among men with prostate cancer.

The specific aims were to:

1. Describe perceived changes in body image among men with prostate cancer.
2. Describe perceived QOL among men with prostate cancer.
3. Explore the relationship between changes in body image and QOL in men with prostate cancer.

Conceptual Model

There is much support for conceptualizing body image within the larger construct of self-concept. This is evident in body image/self-concept literature, related research and conceptual models offered by authors such as Price (1990, 1995, 1998), White (2000), and Mock (1993) and Roy (1999). Each situates body image within a larger construct, such as self-image (Price), self-schema (White), or self-concept (Mock; Roy).

Price (1995) conceptualizes body image as an integral part of one's personal identity, important in the negotiation of one's self-image (1990). In fact, Price defines altered body image as "...a state of personal distress, defined by the patient, which indicates that the body no longer supports self-esteem..." (1998, p. 49). White offers a conceptual model of body image, in which body image schema (a cognitive structure representing the sum of experiences) is the most important construct within the self-schema (2000). Mock (1993) asserts that body image is an integral component of self-concept, which is "...the total perception an individual holds of self – who one believes one is, how one believes one looks, and how one feels about one's self" (p. 154). Lastly, Roy (1999) conceptualizes body image as an integral component of one's physical self, which is a sub-dimension of self-concept. The Physical Self is described as "...appraisal of one's own physical being, including physical attributes, functioning, sexuality, health and illness states, and appearance..." (p. 382). Mock's conceptualization of body image is remarkably similar to the physical self dimension as described by Roy asserting that body image is a "...mental picture of the physical self, and includes attitudes and

perceptions regarding one's physical appearance, state of health, skills and includes attitudes and perceptions.

Foltz (1987) also conceptualizes body image as a component of self-concept, adopting the definition of self-concept as offered by Schain (1980), defining self-concept as the "...sum total of all that a person feels about himself/herself" (p. 303). Further elaborating, self-concept is viewed as consisting of four concept compartments: body, interpersonal, achievement and identification selves. The body compartment is composed of body image and physical function. The interpersonal compartment is composed of the psychosocial self; the ability to relate with the family and social environments, and includes the sexual self. The achievement compartment relates to one's ability to work, and the identification compartment of the self-concept relates to changes of religion or ethical orientation. Each compartment is vulnerable to changes secondary to cancer and cancer treatment. Thus, self-concept is altered through the body self.

Brodsky (1995) explored the psychosocial impact of testicular cancer in a qualitative study. Interviews were conducted with 11 survivors of testicular cancer. Findings of this qualitative study support the self-concept compartments as described by Foltz (1987): The experience of having testicular cancer affected men's "four selves: identification self, interpersonal self, body self and achieving self. Respondents viewed the impact of testicular cancer upon their body with shock, depression, self-consciousness and dismay. Interestingly, alopecia was one of the greatest sources of dismay. Respondents discussed distress at the stigma-inducing effects of appearance changes.

The conceptual model underpinning this research is depicted in Figure 2.

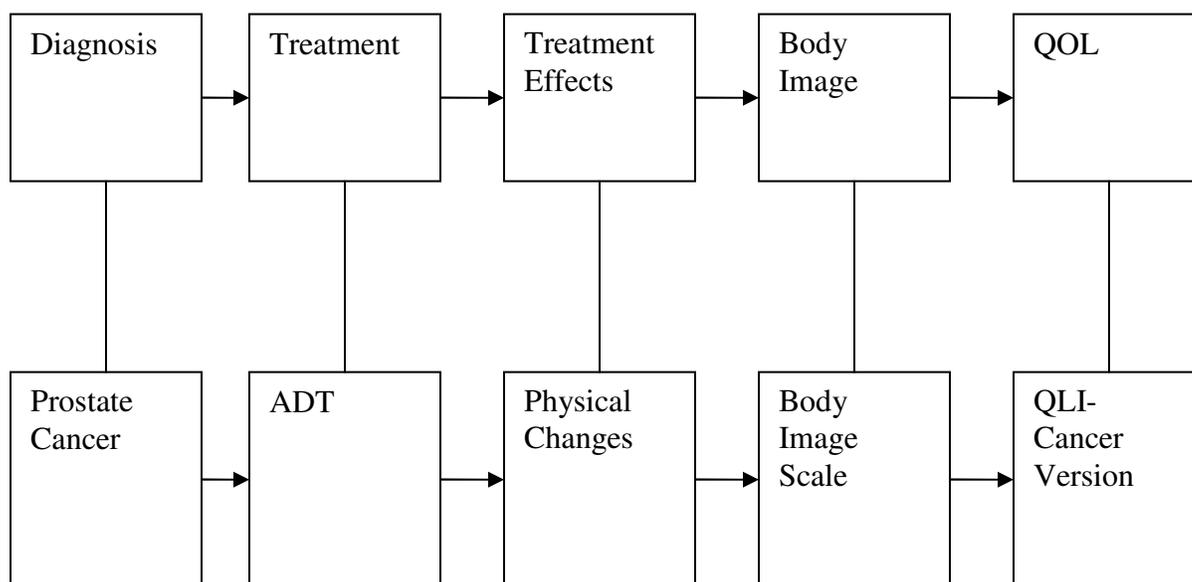


FIGURE 2. Conceptual Model

Definitions

Prostate cancer: Cancer that forms in tissues of the prostate (NCI, 2007)

Body Image: “.....the dynamic perception of one’s own bodily appearance, function, and sensations as well as feelings associated with this perception” (Dropkin, 1999, p. 310), as measured by the Body Image Scale.

Quality of Life: “...a person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her” (Ferrans, 1996, p. 296), as measured by the Quality of Life Index (QLI), Cancer Version-III.

Body Mass Index (BMI): a measure of adiposity, calculated as body weight divided by the square of total subject height (Gallagher et al., 1996).

In conclusion, men receiving ADT for prostate cancer represent a significant proportion of the population of elderly men in this country. While the effect of decreased testosterone upon the inhibition of tumor growth is intended, and beneficial, the effect is not specific: the effect of decreased testosterone has a widespread, systemic impact.

Deleterious side effects include changes in the appearance, and function, of one's body. Hopwood (2001) suggests that body image assessment is particularly important when body integrity or function is breached as a result of medical intervention. This study will assess the effect of the physical and functional changes upon perception of one's body image, describe QOL in this population, and explore the relationship between body image perception and QOL.

Significance to Nursing

ADT therapy places the man with prostate cancer at risk of negative health consequences: fatigue, depression, weight gain, loss of lean body mass, muscle atrophy, anemia, gynecomastia, osteopenia, decreased libido, decreased high density lipoprotein, hot flashes and impotence (Rashid & Chaudhary, 2004). Nursing is in a unique position of service to this population. An assumption of nursing is that the disease as well as psychological, social, spiritual and cultural factors affect human response to illness (King, 2000), and it is this human response to illness that is at the center of the nursing process.

Because treatment choices are accompanied by alterations in form and function of symbolically valued body parts, the human response to prostate cancer, and associated treatment, may be a change in body image. This change in body image is an important component of the complete burden of treatment, and can be expected to negatively influence one's quality of life. Oncology nursing, focused upon the human response to the challenges of cancer and its treatment, is in a pivotal position to influence QOL, an essential aspect of both nursing practice and nursing research (King, 2006). Therefore, it is imperative that nursing explore body image in this population, for body image can be expected to influence how men perceive themselves, and the world in which they live.

The findings from this study will fill a gap in our knowledge regarding the influence of ADT upon change in perceived body image, and the relationship between body image and QOL in men receiving ADT for prostate cancer. Ultimately, the findings of this study will provide a foundation for future studies exploring the relationship between body image and quality of life, and will contribute toward the development of interventions designed to improve QOL in this large population of men receiving ADT for prostate cancer.

CHAPTER II: REVIEW OF LITERATURE

This chapter will present a review of literature relevant to the study of body image and quality of life among men with prostate cancer. Because most men diagnosed with prostate cancer are age 70 or older, the first section will include a literature review regarding physical changes and other developmental aspects of aging for men. The second section will discuss the concept of body image and studies of body image among men with prostate cancer. The third section discusses the concept of quality of life among prostate cancer survivors. The last section summarizes extant research about body image and QOL among prostate cancer survivors, and the value of the proposed study.

Aging Men

“To learn that one is old is a long, complex, and painful experience” (Hareven, 1995, p. 119). Not only is the meaning of aging socially and culturally determined, but it also is related to biological phenomena (Fleming, 1998; Hareven, 1995). In fact, Turner (1995) suggests that the sociology of aging is in its “infancy”, and attests to a lack of understanding between the social and cultural and biological dimensions of life. He refers to embodiment as the melding of the two dimensions. But, because “...ultimately our bodies are not endlessly renewable” (p. 249) one must understand the biological aspects of aging. This fact contradicts the belief that aging is simply a social construct.

The American Geriatric Society [AGS] (2005) describes cellular, bodily and regulatory changes associated with aging. Cellular changes include decreased multiplication of cells, decreased function of cells that regulate immune function and apoptosis, and changes in cellular response to environmental toxins. Bodily changes

associated with aging include decrease in height, weight, and changes in posture and body composition. In men, weight increases until the mid-fifties, to decrease over the next several decades, most rapidly in the late sixties and seventies. Adiposity increases at an alarming rate, doubling between the age of 25 and 75. Additionally, body composition changes include sarcopenia, the age-related loss of muscle mass and strength. Changes in the regulation of body systems, for example, hydration, temperature, response to infection and control of blood pressure, are also noted with aging. However, AGS (2005) maintains that aging, in the absence of disease, is a “remarkably benign process”; Successful aging is influenced by factors such as “...a low probability of disease-related disability, a high level of functional ability, and active engagement in life” (Topp, Fahlman & Boardley, 2004, p. 411). The contribution of a healthy lifestyle, to the extent it positively influences factors of successful aging, cannot be understated.

An additional change associated with male aging is an age-related decrease in testosterone. Knowledge related to the health of normally aging men falls far behind that known about the health of normally aging women (O'Donnell, Araujo & McKinlay, 2004). Fleming (1998) refers to aging males as the “forgotten population.” Research regarding the hormonal sequelae of male aging lags far behind research regarding the hormonal sequelae of female aging. O'Donnell et al. assert that state of the science regarding testosterone, the least studied of all the hormones, is currently in a place similar to that of women's hormonal health issues of several decades ago. Leonard (2004) agrees, citing a paucity of attention to male menopause.

A landmark research effort for the disciplines of aging, urology and endocrinology, The Massachusetts Male Aging Study [MMAS] (1987-2004) was designed to document the changes associated with aging, in a random sample of normally aging men. The authors note a need for an understanding of the differences between biochemical and functional testosterone deficiency, given the current pressure for testosterone replacement (based upon biochemical deficiency). This concern mirrors the hormone replacement therapy (HRT) debate currently still raging (O'Donnell et al., 2004). Given the apparent disasters secondary to HRT, it becomes imperative to document the effects of biochemical and functional androgen deficiency. This community-based longitudinal study evaluated men, aged 40-70, over 3 time periods: (a) 1987-1989, (b) 1995-1997, and (c) 2002-2004. Fifty-two percent (1709) of the total eligible participants completed the in-home protocol. The primary outcome variables were serum hormone levels and erectile dysfunction (ED). Intermediary variables included health status, demographics, health care utilization, physiologic factors, behavior and lifestyle and psychosocial factors. In-home visits were utilized to collect physiologic data, medication inventories, and to gather psychosocial, personality and lifestyle information through interviews and self-administered questionnaires. The findings revealed the effect of age: (a) a decrease in all androgen levels; (b) an increase in complete ED, estimated at 10% overall, ranging from 5% at age 40 to 15% at age 70 years, with age emerging as the strongest predictor of ED; and (c) an increase in free prostate specific antigen (fPSA) with age (O'Donnell et al.).

The operational definition of androgen deficiency offered by the second Annual Andropause Consensus Meeting, 2001, reflects both biochemical and functional aspects. Twelve signs and symptoms associated with low testosterone comprise the androgen deficiency syndrome. These include: (a) loss of libido, (b) erectile dysfunction, (c) depression, (d) lethargy, (e) inability to concentrate, (f) sleep disturbance, (g) irritability, (h) osteoporosis, (i) loss of muscle strength, (j) regression of secondary sex characteristics, and (k) decreased interest in activities (Araujo et al., 2004).

What we do know is that (a) with advancing age testosterone levels decline (O'Donnell et al., 2004); (b) the presence of androgen deficiency is strongly related to age (Araujo et al., 2004); and (c) symptoms associated with the natural decline of testosterone include mood swings, depression, insomnia, irritability, impotence, decreased libido, weakness, lethargy, loss of lean body and bone mass, hot flashes, decreased sperm motility, and increasing frailty (Leonard, 2004). According to Thompson et al. (2003), the constellation of symptoms associated with androgen deficiency is greatly enhanced in men treated with medical or surgical castration for prostate cancer. Williams et al. (2005) add that the deleterious effects of ADT are magnified in an already-at-risk elderly population. Additionally, should the safety and efficacy of exogenous testosterone replacement prove to cure the “ills of aging”, this population of men will be denied this also.

Body Image

This section will begin with a brief overview of definitions of body image, followed by literature specific to body image among men in general, and then literature

specific to body image among aging men. Finally, the section will conclude with existing studies about body image among men who have been treated for prostate cancer.

Pruzinski (2004) in a review of body image, identifies three themes central to the understanding of this concept: (a) it is more than just perception of physical appearance, (b) it is inherently subjective, and (c) it is not static. And while authorities in the field generally agree that body image is a multidimensional construct, a consensus regarding identification of distinct dimensions has proven elusive.

Fawcett and Frye (1980), in an exploratory study, demonstrated the independence of two dimensions of body image: perception and attitude. Perception was identified as the direct mental picture of one's physical appearance; attitude was identified as encompassing a broad spectrum of feelings, attitudes, and emotional reactions toward the body. Included within the attitudinal dimension is cathexis (feelings toward one's body) and valuation of one's body. Both Mock's (1993) and Dropkin's (1999) definitions of body image demonstrate inclusion of such dimensions: (a) "...a mental picture of the "physical self" and includes attitudes and perceptions regarding one's physical appearance, state of health, skills, and sexuality" (p. 154); and (b) "...as the dynamic perception of one's own bodily appearance, function, and sensations as well as feelings associated with this perception" (p. 310).

Jarry and Ip (2005) include a third dimension, a behavioral component, to the attitudinal and perceptual dimensions comprising body image. The behavioral component includes behaviors such as grooming, designed to ensure that the body is "presented" in a socially acceptable fashion. The authors view the attitudinal component as composed of

two dimensions: satisfaction with appearance, and investment. This view is compatible with that of Cash (2004), who also includes evaluation and investment as components of the dimension of attitude.

The existence of a behavioral component is also supported by the body image model proposed by Price (1990, 1995, 1998). Price proposes that body image is maintained through a balance of body real, body ideal and body presentation. Body presentation represents the way the body is presented to the outside environment. This dimension may be significant, and represented in the endorsement of breast and testicular prostheses, and the wearing of wigs. Additionally, this dimension may be a component determining body image differences between perceptions of one's clothed or naked body.

Foltz (1987) also argues for the importance of investment, among other factors, in consideration of body image. She asserts that body image is influenced by factors such as: (a) type of body alteration, (b) sociocultural significance of the altered body part, (c) individual concept of the importance of the body part, (d) age, (e) sex, and (f) marital status. The first three named factors may be captured in the dimension "investment" (Cash, 2004; Jarry and Ip, 2005). White (2000) alleges that there has been a lack of attention to this dimension, particularly in the oncology population. Because all physical attributes are not of equal psychological importance, alterations in particularly symbolic parts may lead to a greater disturbance in body image. The penis and testes, as "...bodily signifiers of distinction from femininity" (Oliffe, 2005) may be symbolic representations of masculinity (Chapple & Ziebland, 2002); an alteration in the form and function of

these organs may lead to a significant impact upon one's body image, and correspondingly, one's self-concept.

This impact of illness upon the physical body may be what Cash (2004) captured in his definition of body image: "Body image refers to the multifaceted psychological experience of embodiment, especially but not exclusively one's physical appearance" (p. 1). And perhaps embodiment is the integration of body image into self-concept.

Body Image in Men

Body image perception has been examined in women (Adams, Turner & Bucks, 2005; Grogan & Richards, 2002; Oberg & Lornstam, 2003), initially with exploration of the relationship between eating disorders and body dissatisfaction (Adams et al.). However, there exists a gap in the body of knowledge related to body image perception in men (Adams et al., Tykla, Bergeron & Schwartz, 2005). Development has been hampered by initial attempts to describe body image in men with instruments which are reflective of aspects of female body image concerns (Davison & McCabe, 2005; Olivardia, Pope, Borowiecki & Cohane, 2004) -- a drive for thinness (Adams et al.; Franzoi & Koehler, 1998) -- whereas men are typically more concerned with muscularity (Olivardia et al.). Additionally, there has been a general agreement that "...social pressures on women to be a particular shape and size are more pronounced than pressures on men" (Grogan & Richards). However, recent findings have placed this supposition in doubt.

Phillips and Castle (2001) report an increase in men "...dissatisfied with, preoccupied with, and even impaired by concerns about their appearance" (p. 1015). This

is reflected with an increase in cosmetic surgery in males and in the incidence of men with eating disorders (Hayslip, Cooper, Doougherty & Cook, 1997).

Olivardia et al. (2004) examined body image and psychological traits in 154 college men, to understand predictors of steroid and other performance-enhancing substance use. Anthropometric measures, and responses to Somatomorphic Matrix (SMM), Beck Depression Inventory –Short Form (BDI) and the Eating Disorders Inventory (EDI), and demographic, exercise and steroid use behavior assessments were analyzed to determine satisfaction with body appearance, the association between poor body image and depression, body dissatisfaction and eating behaviors and the relationship between self-esteem and body satisfaction. Results indicated substantial levels of body dissatisfaction among college-aged males. Self-esteem was significantly negatively correlated with many body dissatisfaction variables. Notably, self-esteem was positively correlated with perceived muscularity. Roots of this body image dissatisfaction have been hypothesized to be a result of increasing societal and media pressures (Hayslip, 1997; Gleeson & Frith, 2006; Grogan & Richards, 2002; Olivardia et al.; Souza & Ciclitira, 2005). For example, male action figures demonstrate increased muscularity; the Playgirl centerfold male has replaced 12 pounds of fat with 27 pounds of muscle, and the population of undressed men in advertisements has increased from 3% of ads in 1950s to 35% in the 1990s (Olivardia et al.). Because body image is formed within a social context (Reas & Grilo, 2004), the discrepancy between real and ideal may lead to body image dissatisfaction.

The pressure for increased muscularity, for both adults and teenagers, was demonstrated in content analysis of focus group interview in which body image emerged as a salient issue and the participants described pressure to look lean and muscular, with a “fear of fat” (Grogan & Richards, 2002). In a study by Adams and colleagues (2005), the majority of men acknowledged the existence of body ideals, the importance of muscularity, and increasing pressure to conform to societal norms and ideals.

Cash et al. (2004) examined changes in facets of body image among 3,127 college students from 1983 through 2001. This cross-sectional study used archival data from 22 published and unpublished studies, at one university, using the Multidimensional Body-Self Relations Questionnaire (MBSRQ). Facets of body image evaluated included overall body-image evaluation, satisfaction with discrete body areas and attributes, preoccupation with being or becoming overweight, and cognitive-behavioral investment in one’s physical appearance. Participants were 30 years of age or younger, and included black and non-black (White, Asian, Hispanic and other ethnicities) men and women. The results demonstrate stability of a “multifaceted body-image dissatisfaction” in 16% of males over that period of time examined.

In summary, body image in men has historically been poorly researched and consequently, is poorly understood. Generally, as in women, the exploration in body image has occurred among young, college aged students. The extant literature provides evidence of the existence of body image concerns in this population. Body image in elderly males may be different. Body image in the elderly has not been adequately investigated (Deeny & Kirk-Smith, 2000). Findings of a review of empirical studies

investigating body image in older adults support the position that older men do experience body dissatisfaction with age Tiggemann (2004).

Body Image in Aging Men

“Gendered ageism”, a belief that signs of aging are more negatively experienced by women (Oberg & Lornstam, 2003), provides an additional bias interfering with exploration of body image in elderly males. A study by Oberg and Lorenstam (2003) was designed to test hypotheses regarding negative attitudes toward old age, among younger respondents, and the existence of gender differences in the attitudes. Mailed surveys were returned by 63% of the randomly sampled group of 1997 Swedes between the ages of 20 and 85. Respondents were given a choice of 4 responses (agree to a great extent – do not agree at all) to statements reflecting attitudes toward embodied aging. Though not defined in this study, embodiment has been defined as “...a form of experiencing the world and making meaning through health-related changes in one’s body” (Shearer, 2006). In response to questionnaires, 43% of respondents agreed with the statement that women who look old lose their sexual attractiveness; only 34% of respondents agreed with a similar statement regarding elderly men (Oberg & Lornstam). Ginn and Arber (1995), authors of the text *Connecting Gender and Aging*, agree with the existence of gendered ageism, acknowledging the existence of a “double standard of aging”.

This concept of gendered ageism was explored in a study by Franzoi and Koehler (1998). The authors compared 132 younger adults with 142 elderly adults across 35 different aspects of their own bodies. Results from analysis of the Body Esteem Scale (BES) demonstrated that although men had generally more positive body attitudes than

females, this difference was less prominent in the elderly. This, however, was believed to be secondary to the decreased importance, among older women, of weight-related issues (Franzoi & Koehler). The findings reflect the importance of investment in body image: with age, investment, or degree of importance placed in body image may decrease.

Janelli (1993) also explored gender differences in body image among elderly inpatients in long-term care facilities. This exploratory study compared body image perception between 39 older men (patients at a veteran's medical facility) and 50 older women (residents of a long-term care facility), using the measures Body Cathexis-Self-Cathexis (BC-SC) and the Draw-a-Person (DAP) Technique. Older women demonstrated a less positive perception of their body image as compared to men, when assessed by the Draw-a-Person (DAP) Technique. The author suggests that this finding is congruent with American cultural values and gender influence upon perception of one's body.

Janelli (1992) evaluated body image in 39 elderly patients residing in a veterans' hospital long-term care unit. Two age groups (60-74 and 75 and older) were compared on BC-SC and the DAP. There were no significant differences based upon age. In fact, the data suggested that older men (older than 60) are fairly satisfied with body parts and aspects of self. The author admits to limitations based upon the setting and instruments used.

Drummond (2003) studied the meaning of the male body, and its implications upon aging men's health. Individual and focus group interviews were conducted with the 6 men, all aged 58 or older, who were members of a formal exercise group. Analysis of interviews revealed themes of importance regarding men and body image: function of the

body, both in terms of what it could do, and could no longer do, was deemed of more importance than appearance. This was felt to reflect the male view of the “body as a machine” or the “instrumental body”. Interestingly, the men in this study were less concerned with self-comparisons with an archetypal male physique, than with the way in which their bodies performed from a physical perspective. However, the importance of function may have been over-emphasized in that the men were members of an exercise group.

Similarly, exploring the perception of body image in the elderly, Deeny and Kirk-Smith (2000) conducted telephone interviews with 9 respondents (ages 65-78 years) recovering from major surgery, in an attempt to understand the changes that they perceived in their bodies, and how this change was expressed. Two bipolar dimensions emerged in analysis of the interviews with the respondents aged 65 to 78. The first, related to body function was verbalized as “badly failed” and “well mended”. The second, descriptive of the body as integral to health and self, was verbalized as “out of sorts” and “in tune”. The authors argued that the aging body, more susceptible to insult from health conditions, may suffer greater psychological effects than their younger counterparts; thus, there exists a need to understand the impact of this change.

In conclusion, body image in men, and in particular aging men, suffers from a profound lack of understanding. What we do know is that aging, compounded by the effects of additional androgen depletion, exerts salient effects upon the physical, metabolic and psychological state of the man. These effects are hypothesized to affect one’s body image perception.

Body Image in Men with Breast Cancer

A sentinel study, noteworthy for its exploration of the physical effects of disease upon psychological and social dimensions in men, was conducted by (Iredale, Brain, Williams, France & Gray, 2006) in a multiphase study investigating the experiences of men with breast cancer in the United Kingdom. Additionally, the study included quantitative assessment of the perception of body image change with the Body Image Scale (BIS).

In Phase 1 of the study, focus groups of men and women with breast cancer, and health professionals, were convened to compare experiences of men and women. Content analysis from interviews with 6 men with breast cancer identified seven major issues: delay in diagnosis, shock, stigma, body image, causal factors, and the provision of information and emotional support (France et al., 2000).

In Phase 2, 161 men with breast cancer completed questionnaires assessing anxiety and depressive symptoms, cancer-specific distress, body image, coping, information and support needs, and clinical and demographic variables (Brain, Williams, Iredale, France & Gray, 2006). Body image was assessed in this study with the Body Image Scale (BIS), a 10 item scale designed for use in cancer patients. Multiple regression analysis identified altered body image as the most salient factor associated with depression.

In Phase 3, follow-up interviews were conducted with 30 men with breast cancer; and in Phase 4, two focus groups were reconvened. Joint analysis of data, from the two phases, revealed a considerable level of embarrassment associated with the diagnosis of

breast cancer (Iredale et al., 2006). These findings indicate a significant impact of diagnosis upon body image.

Body Image in Men with Prostate Cancer

There exists a gap in the literature regarding body image in men with prostate cancer. And this is in spite of the fact that the treatment for prostate cancer has significant effects upon physical appearance and functional ability. Oliffe (2005) explored the experience of impotence and its effect on perceived masculinity, sexuality and intimate relationships in a qualitative study of 15 men with prostate cancer. Analysis of in-depth semi-structured interviews revealed participants' distress, and surprise, at post-surgical changes in their penis. The author posited that this illuminates a discrepancy that exists between the amount of information provided in pre-surgical discussions of breast loss for women, and the amount provided in pre-surgical discussions of prostatectomy-induced changes for men.

Hedestig, Sandman, Tomic and Widmark (2005) interviewed 10 men undergoing external beam radiation therapy for prostate cancer. Men in this study acknowledged the importance of appearance of the body. Participants discussed feelings of exposure and mutilation as a result of waning erectile ability; and admitted to an unwillingness to expose their bodies, "...because the penis is so little."

In-depth interviews were conducted with 15 Israeli men in an attempt to understand the changes in spousal relationships as a result of hormonal therapy for prostate cancer. Participants reported that changes in their personality and bodily appearance created an emotional distance in the spousal relationship. Participants

verbalized “disgust” with their bodies; and a lack of “masculine coping skills” perceived as related to the treatment (Navon & Morag, 2003).

Harden et al. (2002), in a study exploring the experiences of couples with prostate cancer, support these findings. Six focus groups, consisting of men with prostate cancer (n=22) and their spouse-caregivers (n = 20) were convened. Analysis of data revealed the effect of prostate cancer upon the couple. Men felt the effect of the hormones on their “sense of power”. Women reported a decreased sense of femininity as husbands lost interest in them as sexual partners.

Chapple and Ziebland (2002) conducted unstructured interviews with 52 men with prostate cancer. Men who received hormonal treatment reported profound effects upon libido, energy, body shape, ability to work and competitiveness. Interviews revealed a perceived loss of masculinity secondary to impotence, decreased libido and breast enlargement. The authors conclude that the impact of illness upon the physical body must be considered.

Evidence from oncology literature supports the importance of body image upon sexuality, constructions of femininity and masculinity, self-confidence, attractiveness, and various aspects of social and psychological distress. What is missing is the effect upon QOL.

Quality of Life Among Men with Prostate Cancer

This section will begin with a brief overview of QOL, followed by literature specific to QOL in men with prostate cancer, and completing with a review of studies of

body image and QOL among men with prostate cancer. QOL shares similar conceptual characteristics with body image: that of multidimensionality and subjectivism.

Although the definition and conceptualization of QOL may differ based upon the perspective, discipline and the population of interest, most experts agree that QOL is a multidimensional concept (Aaronson et al., 1990) which includes dimensions of physical health, psychological well-being, social or socioeconomic resources, functional ability, spiritual well-being, and satisfaction with life (King, 2006). Aaronson et al. suggest that these dimensions may be subdivided to include components specific to the population being studied and the research question at hand. King would agree, stating that the focus of the various dimensions might include particular aspects of QOL that are affected by the disease and/or treatment.

An associated term, often used interchangeably with QOL, is health related quality of life (HRQOL). This latter term is representative of a more disease- and treatment-related focus than QOL (Bonomi, Patrick, Bushnell & Martin, 2000). HRQOL is a more narrowly focused definition of QOL. This study used the more encompassing and global definition of QOL.

The second characteristic inherent within this concept is that of subjectivity. Experts agree that QOL is subjective, with the individual as the best source of information (Aaronson et al., 1999). This represents a departure from tradition, when instruments, such as the Karnofsky Performance Scale (KPS) were used as measures of QOL. This scale was designed to measure the patient's ability to engage in physical activity, thus serves as a measure of functional performance. It is composed of 100

points, with 100 representing full, unimpaired activity level. Graded by the physician, it does not reflect the patient's perceived quality of life (Padilla & Grant, 1985) . In addition to its unidimensionality, as a measure of function, it has demonstrated poor congruency between clinician-based and client based ratings of QOL (Haberman & Bush, 2003).

Ferrans (1996) offers a definition of QOL, reflective of characteristics of multidimensionality and subjectivity, capturing attributes deemed necessary, is appropriate for use in this study: "...a person's sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her". However, there is a dearth of studies using a global definition of QOL in this population.

QOL, in this population, has been studied less than in patients with other neoplasms (Herr, 1997; Kornblith, Herr, Ofman, Scher & Holland, 1994). And when studied, the focus has been upon disease-specific, physical complications (Eton & Lepore, 2002; Kornblith et al.; Weber & Sherwill-Navarro, 2005), such as the incidence of treatment-induced incontinence, impotence (Galbraith, Arechiga, Ramirez & Pedro, 2005) and urinary and bowel problems (Andel & Kurth, 2003; Clark et al., 2003; Dacal, Sereika & Greenspan, 2006; Eton & Lepore; Galbraith et al.; Green, Pakenham, Headley & Gardiner, 2002; Miller et al., 2005; Penson et al., 2003; Potosky et al., 2004; Potosky et al., 1999; Potosky et al., 2001; Rosenfeld, Roth, Gandhi & Penson, 2004). Because the focus has been upon HRQOL, and not QOL, we do not know the complete burden of androgen deprivation therapy upon QOL.

One of the largest studies evaluating HRQOL in prostate cancer was The Prostate Cancer Outcomes Study (PCOS). The purpose of this study was to investigate variations

in the initial treatment of prostate cancer, and to describe HRQOL outcomes in a large, heterogeneous cohort of newly diagnosed prostate cancer patients treated in community medical practices (Potosky et al., 1999). More than 11,000 men, diagnosed between October 1, 1994 and October 31, 1995, were eligible for the PCOS. A pre-specified sampling design was used to ensure adequate representation of eligible patients and a sufficient number of minority participants. Sixty-two percent of men (3,486) from a sampled total of 5,672 completed survey questionnaires at 6, 12 and 24 months after initial diagnosis. The PCOS survey instrument was designed to focus on urinary, bowel and sexual dysfunction. Selected scales from the Medical Outcomes Study (MOS) were included; however, to "...minimize respondent burden and to focus on disease-specific function, we excluded three scales of the SF-36 [physical and social function scales and general health perceptions]" (p. 1721). The five scales which were included focused upon bodily pain, depression/anxiety, vitality, role limitations related to physical health, and role limitations related to emotional health (Potosky et al.).

Several studies report on findings from this large database. Comparisons were made between men receiving androgen deprivation therapy (ADT) and men receiving no therapy (Potosky et al., 2002); and men receiving ADT with orchiectomy and men receiving ADT by luteinizing hormone-releasing hormone [LHRH] (Potosky et al., 2001); and men in each of 4 primary therapies: watchful waiting, hormone ablation (ADT), radiotherapy and radical prostatectomy (Penson et al., 2003).

ADT, achieved with LHRH, was associated with increased impotence, more physical discomfort, and a decline in vitality (Potosky et al., 2002). LHRH patients

reported more breast swelling, more physical discomfort and worry about cancer or its treatment, and assessed their overall health as poor or fair more frequently than did orchiectomy patients. They were also less likely to consider themselves free of prostate cancer (Potosky et al., 2001). When comparing primary therapies, an independent association between primary treatment and general HRQOL was not demonstrated, however, men with sexual dysfunction had significantly reduced HRQOL in all domains (Penson et al., 2003).

Another large study, Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE), compared HRQOL outcomes in a cohort of men receiving ADT with a cohort who opted for surveillance. HRQOL was evaluated with the SF-36 (8 scales assessing general physical function, role function-physical, bodily pain, general health, energy/fatigue, social function, role function-emotional, mental health, and comparative health) and the UCLA Prostate Cancer Index (a disease specific instrument assessing urinary function, urinary bother, bowel function, bowel bother, sexual function, and sexual bother). Questionnaires from 699 participants were analyzed. The men receiving ADT reported poorer urinary and sexual function and a higher rate of distress associated with this poorer function, than men receiving surveillance (Lubeck, Grossfeld & Carroll, 2001).

Another study examining the influence of ADT upon QOL in asymptomatic men with non-metastatic prostate cancer was conducted by Herr and O'Sullivan (2000). Longitudinal data regarding QOL in this sample of 144 men was assessed with the European Organization for Research and Treatment of Cancer (EORTC) Prostate Cancer

Quality of Life Questionnaire, the intrusion subscale of the Impact of Event Scale, and Selby's Quality of Life (QL) Uniscale. The EORTC questionnaire was designed to measure physical function, physical symptoms, fatigue/malaise, psychological distress, sexual problems and the impact of disease on the family. The intrusion subscale measured cognitive-emotional distress related to cancer. Selby's QL Uniscale was a global assessment of quality of health. The men who received ADT (n=79) reported more fatigue, loss of energy, emotional distress and a lower overall quality of life than men who deferred hormone therapy (n=65). Because the patients were asymptomatic from a disease standpoint, the data suggest that ADT was responsible for the negative effects experienced.

Green et al. (2002) studied the effect of different pharmacologic treatments upon HRQOL in a sample of men with prostate cancer (N=65). Men were randomized to one of 2 androgen suppressing (AS) therapy (LHRH analog or steroidal antiandrogen), or to close clinical monitoring. Included in the study were 16 community volunteers matched for age and general health. It was hypothesized that men receiving AS therapy would report greater sexual impairment compared with close clinical monitoring or community controls. Dimensions of HRQOL were measured with various instruments, including measures of emotional distress (Depression Anxiety Stress Scales), existential satisfaction (Satisfaction with Life Scale), physical/urinary function, social role and cognitive function (EORTC-QLQ-C30), and sexual function (supplemental module to EORTC-QLQ-C30). A repeated measures group x time (baseline and at 6 months) was used to analyze data. Men receiving AS demonstrated significantly worse sexual

deterioration as compared to patients assigned to close clinical monitoring or community volunteers. Additionally, AS was associated with decreases in sexual, social/role and subjective cognitive functions; and increases in physical/urinary function.

Another longitudinal study examining the impact of ADT upon HRQOL in asymptomatic men revealed similar findings (Andel & Kurth, 2003). The objective of the study was to explore the impact of ADT, initiated at diagnosis, compared with no therapy, on general and disease-specific HRQOL. Men with prostate cancer (N=91) completed the EORTC Quality of Life Questionnaire (QLQ-30), the Selby Uniscale, the International Prostate Symptom Score (IPSS), the Sexual Behaviour Questionnaire (SBQ) and investigator-constructed questions about the occurrence of hot flashes. Six multi-item scales comprised the EORTC QLQ-30: physical function (PF), role function (RF), emotional function (EF), social function (SF), and global health status/QOL. The Selby Uniscale is self-rated visual analogue scale referent to one's energy level in comparison to others. The IPSS is a questionnaire which accesses urinary symptoms, and the SBQ contains 6 items referent to relationships and sexuality. Data were collected approximately 6 months after the initial diagnosis was made, and every 12 months, thereafter, until death. Men receiving ADT demonstrated significantly worse sexual, emotional, and physical function, experienced more hot flushes and had a worse overall HRQOL, compared with patients receiving no therapy. Again, it is significant that asymptomatic men became symptomatically worse as a result of medical intervention. And of import, the duration of survival was similar.

The effect of duration of ADT upon HRQOL was examined in a study comparing men who received ADT for less than 6 months, those receiving ADT for greater than 6 months, and healthy controls (Dacal et al., 2006). This cross-sectional study evaluated 96 males on measures of body composition, testosterone levels and QOL. The Short Form - 36 (SF-36) was used to measure QOL. Body image, however, among the 8 dimensions measured (physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional and mental health) was not assessed. An additional component to this study was the measurement of physiologic characteristics: body composition (dual-energy x-ray absorptiometry) and gonadal status (serum total and free testosterone). ADT was associated with significantly poorer QOL in aspects of physical function, general health and physical health component summary than men not receiving ADT. The expected effect of ADT on physical characteristics was confirmed: those receiving ADT had a higher percentage of body fat, and a lower percentage of lean body mass. There was no difference in HRQOL based on duration of ADT.

In addition to duration of ADT, the timing of ADT has been evaluated for an effect on QOL (Green et al., 2004). In a repeated measures randomized study, HRQOL was evaluated in 4 treatment arms: leuprorelin (LHRH), goserelin (LHRH), cyproterone acetate (aa), or close clinical monitoring (watchful waiting). Among the 62 men who completed the one year study were 15 community volunteers (of similar age) without prostate cancer. Cognitive and psychosocial assessments were conducted by a clinical psychologist, unaware of the patient's group. Measures of QOL (depression anxiety stress scales, satisfaction with life scale, physical and symptom function, subjective

cognitive function and sexual function), memory, attention and executive functions were assessed. AS was associated with worse HRQOL, in the domains of cognitive and sexual function. Additionally, both cyproterone acetate and close clinical monitoring were associated with increased emotional distress.

ADT may also be administered in combination with radiation therapy after failure of prostatectomy. The effects of salvage radiotherapy and androgen suppression (AS) on QOL was examined in a 74 patient study (Pearce et al., 2005). The EORTC QLQ-30 and an additional prostate cancer-specific module were completed at baseline (prior to treatment) and at 3 and 6 weeks into radiation therapy, 2 months after the start of AS, and every 4 months for 2-years. Significant effects were noted in bowel and urinary function, as measured by a prostate cancer-specific scale. It is noteworthy, however, that the prostate specific module instrument used assessed only urinary, sexual and bowel function. Of the 5 domains comprising the EORTC QLQ-30, only the physical and role functional domains demonstrated a significant change from baseline, decreasing during AS.

Review of the literature regarding QOL in men receiving ADT for prostate cancer is notable in that body image is absent from almost all QOL assessments. In fact, the BIS scale, to be used in this study, was developed by the EORTC to address just this deficit. In a population that experiences significant effects upon physical appearance and function, the existence of this gap is remarkable.

QOL and Body Image in Men with Prostate Cancer

There have been only two studies investigating the relationship between body image and QOL among men treated for prostate cancer. The first was undertaken by Clark et al. (1997) and designed to construct a patient-based measure of the impact of disease and treatment-related QOL in men after treatment. Focus groups (15 with patients, 2 with spouses) were convened to develop questionnaire items that were important to men treated for metastatic prostate cancer. Analysis of the data revealed three domains of life quality were important in metastatic prostate cancer: physical and emotional aspects of self-image, anxiety about the effects of treatment, and concern with the process of decision-making and treatment. Reported bodily changes included loss of muscle tone, weight gain, breast enlargement, loss of body hair, and hot flashes. Items derived from these domains, in addition to items assessing symptoms, co-morbidities, and generic measures of functional status and well-being, were combined in a survey and mailed to a convenience sample of 410 patients with metastatic prostate cancer. The 201 participants who completed the surveys were almost evenly divided between white (53%) and black (42%). Psychometric analysis identified 9 reliable and valid indicators of prostate cancer-specific QOL: body image, sexual problems, spouse affections, spouse worry, masculinity, cancer-related self-image, cancer distress, cancer acceptance, and regret of treatment decision. Body image was moderately correlated with both masculine image ($r = 0.46$) and self-image ($r = 0.53$). From these identified domains, a 33 item scale was developed, to be used as a disease- and treatment-sensitive health-related quality of life instrument (Clark et al.).

Continuing the work begun by Clark et al. (1997), Fowler, Collins, Corkery, Elliott and Barry (2002) evaluated the effect of ADT administered after prostatectomy, in men with prostate cancer. Those who received ADT after prostatectomy were compared with those who were not treated with ADT on 7 multi-item measures of HRQOL: impact of cancer and treatment, concern regarding body image, mental health, general health, activity, worries about cancer and dying, and energy. A mailed survey was returned by 82% (n =1089) of those identified through the Medicare Provider and Analysis and Review (MedPAR). Findings revealed statistically significant decrements associated with androgen deprivation therapy among all 7 HRQOL measures. This study stands alone in its inclusion of a body image scale among measures of HRQOL.

Numerous studies have documented decrements in QOL among men receiving ADT. QOL has been found to be worse in men receiving ADT when compared with men receiving surveillance only (Andel & Kurth, 2003; Herr & O'Sullivan, 2000; Lubeck et al., 2001; Potosky et al., 2002); in men undergoing medical when compared with surgical castration (Potosky et al., 2002); and in men receiving flutamide as compared to placebo after surgical castration (Moinpour et al., 1998). Comparison of men receiving different pharmacologic methods of androgen suppression, and close clinical monitoring revealed again detrimental effects upon QOL in those receiving androgen suppression (Green et al., 2004). Duration of ADT therapy was not determined to have a significant effect upon QOL, though in comparison with healthy controls, those receiving ADT demonstrated a poorer QOL (Dacal et al., 2006).

However, what has not been adequately assessed in the androgen-deprived population are ADT-specific QOL indicators, such as changes in physical appearance, and the impact of those changes. A review article examining QOL in patients with prostate cancer confirms this observation (McPherson, Swenson & Kjelberg, 2001). Within the article is a table of general and treatment-specific QOL instruments endorsed for use in patients with prostate cancer. In only one of the studies presented is an instrument included which measures body image, though this has been identified as a concern in this population: Body image, self-image, and cancer-related self-image emerge when patients are asked about which quality of life issues are important (Clark et al., 1997).

Conclusion

Analysis of qualitative data emerging from focus groups or interviews have identified body image as a concern in males with testicular cancer (Chapple & Ziebland, 2002; Gurevich, Bishop, Bower, Malka & Nyhof-Young, 2004; Sheppard & Wylie, 2001), breast cancer (France et al., 2000), and prostate cancer (Chapple & Ziebland, 2002; Clark et al., 2003; Clark et al., 2001; Kelly, 2004; Navon & Morag, 2003; Oliffe, 2005).

We have been informed of the salient impact of body image upon indicators of QOL in women with breast cancer. Although the sequelae of physical changes following ADT is well documented, knowledge related to these changes is missing. Additionally, there is a large gap in our knowledge of the relationship of body image and QOL in men with prostate cancer. This study will provide a foundation for understanding the effects of

physical changes upon one's body image, and the subsequent effect of these changes upon QOL. In turn, findings from this study may begin to lay a foundation for the development of interventions designed to improve QOL in this large population of men receiving ADT for prostate cancer.

There is some evidence that exercise has the potential to impact body image, and would be a further area of research. Taylor and Fox (2005) evaluated the effectiveness of an exercise intervention on the physical self-perception of 40-70 year old participants. Physical self-perception was measured with a short version of the Physical Self-Perception Profile (PSPP). The 142 participants were randomized to an exercise or control group. Those in the exercise group demonstrated greater physical self-worth, physical condition, and physical health at 16 and 37 weeks as compared to the control group.

Pinto and Trunzo (2004) assessed mood states and body esteem in groups of breast cancer survivors. Body esteem was measured with the Body Esteem Scale (BES), a 35 item questionnaire that assesses sexual attractiveness, physical condition, and weight concerns. Those women who reported regular exercise ($n = 40$) reported significantly more positive attitudes toward their physical condition and sexual attractiveness than sedentary women ($n = 79$). In addition, the women who exercised demonstrated less confusion, fatigue, depression and total mood disturbance.

CHAPTER III: METHODS

The purpose of this study was to describe changes in body image and quality of life among men with prostate cancer, to describe the relationship between body image and quality of life in this population, and to explore the differences in body image and QOL related to treatment, age, duration of therapy and body mass index. This chapter will present the methodology of this exploratory, descriptive study. Information presented will include description of the sample (including recruitment procedures), and setting; discussion of the protection of human subjects; and research questions. Data collection methods will include a description of each instrument. And lastly, information regarding the data analysis plan, designed to answer each research question, will complete this chapter.

Design

An exploratory, descriptive design was used to explore body image and quality of life in men with prostate cancer. The design offers convenience, efficiency (in terms of time and money), effectiveness, and realism. Descriptive studies often lay the foundation for further, more rigorous study (Polit & Hungler, 1983). Given the large gap in knowledge related to the effects of body image changes related to ADT, and the relationship between these changes and QOL, there is a need to begin to lay a foundation for further studies.

Sample

Men enrolled in the urology or oncology ambulatory care clinics at the Veterans Affairs Medical Center (VAMC) were recruited for participation in this study. Inclusion

criteria included men with a diagnosis of prostate cancer, ability to read and write English, and age greater than 60 years old. Exclusion criteria included the diagnosis of a significant cognitive co-morbidity (i.e., dementia, Alzheimer's disease).

Setting

The setting for this study was the Ambulatory Care Services (ACS) of a large urban Veterans Affairs Medical Center (VAMC). Established in 1997, the Ambulatory Care Service (ACS) consists of four primary care clinics within the main facility, and five community-based outpatient clinics. In addition to the primary care and community-based clinics, the ACS includes three in-house specialty clinics: internal medicine, surgery and medical sub-specialty clinics. Hematology-Oncology clinic is included within the medical sub-specialty clinics; Urology is included within the surgical clinic. The ACS provides healthcare to 48,000 different veterans at approximately 410,000 visits per year.

Recruitment

Participants were recruited from the oncology and urology services of the ACS. Patients with a diagnosis of prostate cancer were offered a flyer advertising the study, by their provider or clinic nurse. In addition, flyers were posted in each exam room in the urology, oncology and out-patient nursing (OPD) clinics. Interested, potential, participants were offered an introduction to the principal investigator (PI) at the conclusion of the clinic visit. Screening for eligibility to participate, further explanation of the study, and answering of participant questions took place in a private room located in the clinic area. Alternatively, potential participants were offered a choice to delay this

discussion. Those electing this option indicated this by supplying contact information on the advertising flyer, and placing the advertising flyer into a locked box, labeled “Harrington Study”. The boxes were located at checkout areas. The flyers were collected at the end of each clinic day. Follow-up phone calls were made to explain the study, answer questions, and set up an appointment date for consent and completion of the questionnaires.

Upon completion of informed consent, the participants were given the paper and pencil questionnaires for completion, and an envelope in which to place the completed questionnaires. These envelopes were collected by the PI. Each set (Demographic; Disease; BIS, QLI) of questionnaires was given a unique code to assure confidentiality of the participants. This code list was maintained and double password protected on the PI’s computer in her office. Flyers with identifying information were destroyed. The code list remains the only link between the participant and their responses. The code list remains the only link between the participant and his questionnaires.

Protection of Human Subjects

Some issues related to the dual role of the PI in this study were addressed with the Institutional Review Board (IRB). The basic principles of the Belmont Report include respect for persons, beneficence and justice (Dunn & Chadwick, 2002). Voluntariness of consent, a necessary component of informed consent, is reflected in the principle of respect for persons. As the PI was involved in the diagnosis, treatment and care of some of the participants, it was necessary to insure, and maintain, a clear boundary between the researcher and the clinician roles of the PI. Otherwise, coercion and undue influence,

albeit unintentional, may result. Thus, the PI was not involved in recruitment of potential participants: rather, the study was introduced via an informational flyer offered to potential participants by staff members not participating in the research.

The principle of beneficence demands that an evaluation of risk/benefit guide the research (Dunn & Chadwick, 2002). The disclosure of sensitive information, i.e., how one views one's body image, was treated with confidentiality and sensitivity, and with an awareness of personal vulnerability engendered with disclosure of this personal information and insight. Confidentiality was maintained throughout the study. Benefits to participation may have included greater insight in one's own body image.

The principle of justice, fairness of distribution (Dunn & Chadwick, 2002), also was addressed in sample selection. Eligible participants received equal opportunity to participate in the study. Potential participants were informed of the study via informational flyers posted, and available, in the exam rooms of their oncology or urology providers, or in the clinic treatment area. Thus, even if not invited by their providers, potential participants would be aware of the study, and have the opportunity to participate. Advertising the study and requesting volunteers broadened the potential sample, and ensured fairness of distribution. This ensured that those patients receiving goserelin acetate injections in an outlying clinic will have the benefit of participation in the study.

Research Questions

1. Is there a perceived change in body image in men with prostate cancer?
 - 1a. Is there a difference in perceived change in body image related to treatment in men with prostate cancer?
 - 1b. Is there a relationship between perceived change in body image and age in men with prostate cancer?
 - 1c. Is there a relationship between perceived change in body image and duration of therapy in men with prostate cancer?
 - 1d. Is there a relationship between perceived change in body image and BMI in men with prostate cancer?
2. What is the perceived quality of life in men with prostate cancer?
 - 2a. Is there a difference in perceived quality of life related to treatment in men with prostate cancer?
 - 2b. Is there a relationship between perceived quality of life and age in men with prostate cancer?
 - 2c. Is there a relationship between perceived quality of life and duration of therapy in men with prostate cancer?
 - 2d. Is there a relationship between perceived quality of life and BMI in men with prostate cancer?
3. What is the relationship between perceived change in body image and QOL in men with prostate cancer?

3a. What is the relationship between perceived change in body image and health and functioning QOL?

3b. What is the relationship between perceived change in body image and psychological/spiritual QOL?

3c. What is the relationship between perceived change in body image and social and economic QOL?

3d. What is the relationship between perceived change in body image and family QOL?

Data Collection Instruments

Demographic and Disease-Related Data

Socio-demographic and disease-related information were collected via two instruments designed for this purpose (See Appendix C). The Socio-demographic instrument facilitated the collection of information regarding age, ethnicity, education, and marital and employment status. The Disease-related instrument facilitated the collection of information regarding date and cancer stage at diagnosis, initial therapy, date of initial therapy, initiation of ADT, duration of ADT, and BMI, and documentation of dementia.

Body Image Scale (BIS)

The Body Image Scale (BIS) is a ten item scale developed to measure changes in body image in cancer patients (see Appendix C). The scale has four possible responses: 0 corresponds to “not at all”; 1 corresponds to “a little”; 2 corresponds to “quite a bit” and 3 corresponds to “very much”. BIS scores are calculated by adding the score obtained on

each item, yielding a range of possible scores from 0-30, with higher scores indicating a greater degree of body image change. This scale, constructed in collaboration with the EORTC Quality of Life Study Group, was initially tested in a heterogeneous group of British cancer patients. It was re-tested, following revisions, in 682 breast cancer patients. Psychometric analysis revealed high reliability (Cronbach's alpha 0.93), and good clinical validity. Clinical validity measures included response prevalence (the frequency of positive scores for each item), discriminant validity (ability to discriminate on the basis of known group comparisons), sensitivity to change and consistency of scores. Response prevalence met the EORTC response rate criterion of 30%: all items were answered with a score of >0 by 30% of respondents. Discriminant validity was demonstrated by evaluating the difference in median scores between women treated by mastectomy and those receiving conservative surgery ($P < 0.0001$, Mann-Whitney). Sensitivity to change was demonstrated by comparison of scores over time (2 weeks and 4 months) [$P < 0.001$, Wilcoxon signed ranks test]. Consistency of scores was demonstrated with similar BIS scores across type of surgery, among women receiving care at several breast cancer treatment centers. The lowest scores were in the groups women who had conservative surgery; the highest in patients treated by mastectomy. Factor analysis revealed a single factor accounting for >50% of variance (Hopwood, 2001).

Of issue in the use of this instrument, is the fact that it has never been tested in a population of prostate cancer patients, though it has been used in men with colorectal and testicular cancers. In anticipation of use of the instrument in this study, face validity for the instrument was tested in 5 adult men (2 with prostate cancer, a hospital social worker,

oncology patient care assistant and a healthy community volunteer) in the spring of 2006. This study involved assessment of the instrument's face validity, readability, cultural and gender bias. Among the men, it was a well-accepted questionnaire, and determined to be of value in a study assessing body image change in men with prostate cancer. Cronbach's alpha was used to assess internal consistency of the instrument in this study.

Quality of Life Index (QLI)

The Quality of Life Index (QLI) is a questionnaire consisting of 33 items in each of 2 sections, for a total of 66 items (see Appendix D). The first section measures satisfaction in 4 domains; the second measures the importance, to the individual, of the 4 domains. The four domains include health and functioning, psychological/spiritual, social and economic, and family (Ferrans, 1996). Responses to items in the first part of the scale range from "very dissatisfied" to "very satisfied" on a 6-point Likert scale. Responses for items in the second part of the scale range from "very important" to "very unimportant" on a 6-point Likert scale. QLI scores are calculated using a weighted scale which pairs a satisfaction response with an importance response. The weighted scale calculations yield an overall QOL score, and separate subscales for each domain. Scores range from 0-30, with higher scores indicating better QOL. Initial testing in a breast cancer population revealed high reliability (Cronbach's alpha 0.95) overall, and in each of the 4 domains: health and functioning (0.90), socioeconomic (0.84), psychological/spiritual (0.93) and family (0.66). Acceptable concurrent validity ($r = 0.80$) and construct validity was demonstrated (Ferrans, 1990). Concurrent validity was established by correlation between the QLI and a measure of satisfaction. Construct validity was established using the

known group technique: those with less pain, less depression, and evidence of coping better with stress demonstrated higher mean QOL scores. This instrument is used in 18 countries by nurses, physicians, psychologists, among other health care professionals, and has been translated into 9 languages (Ferrans, 1996).

Additionally, this instrument has been used in men with prostate cancer, and has demonstrated acceptable reliability and validity (Wallace, 2003). A convenience sample of 19 men completed mailed surveys designed to explore uncertainty, anxiety, appraisal of uncertainty, and to explain the health-related and affective QOL of men undergoing watchful waiting. Although specific information relating to the psychometric performance of the QLI in this study is not available, the author notes that internal consistency for the multiple scales used in this study (Mishel Uncertainty in Illness Scale-Community Form [MUIS-C], State-Trait Anxiety Scale, Appraisal Scale, University of California Prostate Cancer Index [UCLA-PCI] and QLI) in this study was 0.78-0.88.

Data Analysis

A combination of descriptive and inferential statistics was used to answer the research questions.

Research Question 1

Research question 1, “Is there a perceived change in body image in men with prostate cancer?” was answered by compilation of scores on the BIS.

Research question 1a, “Is there a difference in perceived change in body image related to treatment in men with prostate cancer?” was answered by t-test.

Research question 1b, “Is there a relationship between perceived change in body image and age in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between BIS score and age.

Research question 1c, “Is there a relationship between perceived change in body image and duration of therapy in men receiving ADT for prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the BIS and duration of therapy (in months).

Research question 1d, “Is there a relationship between perceived change in body image and BMI in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the BIS and BMI.

Research Question 2

Research question 2, “What is the perceived quality of life in men with prostate cancer?” was answered by computation of scores on the QLI overall, and for each domain.

Research question 2a, “Is there a difference between perceived QOL related to treatment in men with prostate cancer?” was answered by t-test.

Research question 2b, “Is there a relationship between perceived QOL and age in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and age.

Research question 2c, “Is there a relationship between perceived QOL and duration of therapy in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and duration of therapy.

Research question 2d, “Is there a relationship between perceived QOL and BMI in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and BMI.

Research Question 3

Research question 3, “What is the relationship between perceived change in body image and QOL in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between BIS scores and QLI overall.

Research question 3a, “What is the relationship between perceived change in body image and health and functioning QOL?” was answered by calculation of the Pearson product moment correlation between BIS scores and scores in the health and functioning domain.

Research question 3b, “What is the relationship between perceived change in body image and psychological/spiritual QOL?” was answered by calculation of the Pearson product moment correlation between BIS scores and scores in the psychological/spiritual domain.

Research question 3c, “What is the relationship between perceived change in body image and social and economic QOL?” was answered by calculation of the Pearson product moment correlation between BIS scores and scores in the social and economic domain.

Research question 3d, “What is the relationship between perceived change in body image and family QOL?” was answered by calculation of the Pearson product moment correlation between BIS scores and scores in the family domain.

In conclusion, this exploratory descriptive research study explored the perception of change in body image, QOL, and the relationship between this perception and quality of life in a convenience sample of men with prostate cancer. Additionally, the study explored the effects of treatment, age, duration of therapy and BMI upon perception of change in body image and QOL. It was expected that the findings of this study will contribute, in a significant way, to the body of knowledge regarding the experiences of men with prostate cancer.

CHAPTER IV: RESULTS

This chapter will present results of data analysis. The first section will describe the sample, utilizing descriptive statistics. The second section will present the results of preliminary data analysis related to instrument reliability, sample grouping and normality of variables. The third section will present the results of data analysis related to each research question. The chapter will conclude with a summary of findings of the analysis.

Sample

The sample consisted of one hundred and thirty-two men with prostate cancer, at least 60 years of age, recruited from the oncology and urology out-patient departments at an urban Veterans Affairs Medical Center. Non-Hispanic White men composed 75% of the sample. Over half of the sample was married (56%). Approximately equal numbers of men were widowed (18.9%) or divorced (20.5%). Retired men composed 75% of the sample, with the next largest group composed of men working part-time (16%). Most of the sample, (82.6%), had education at the high school level or above; however, almost 38% of the sample was composed of men for whom high school was the highest level of education achieved. Table 1 illustrates the demographic characteristics of the sample population.

TABLE 1. Demographic Data

Variable ^a	Sample: (N=132)
Age	
Range	60 - 91
Mean	73
SD	7.75
Marital Status	
Married	74 (56%)
Never Married	5 (3.8%)
Widowed	25 (18.9%)
Divorced	27 (20.5%)
Widowed/divorced	1(.8%)
Race	
American Indian	3 (2.3%)
African American	16 (12.1%)
Hawaiian	1 (.8%)
White	106 (80.3%)
Refuse	5 (3.8%)
Missing	1(.8%)
Ethnicity	
Hispanic	15 (11.4%)
Non-Hispanic	114 (86.4%)
Missing	3 (2.2%)
Employment	
Retired	99 (75%)
Full-time	9 (6.8%)
Part-time	21 (15.9%)
Unemployed	3 (2.3%)
Education	
8 years or less	8 (6.1%)
9-11 years	15 (11.4%)
High school	50 (37.9%)
13-15 years	41 (31.1%)
16 or greater	18 (13.6%)

^aNever married, widowed/divorced, American Indian, Hawaiian, Hispanic, full-time employment, unemployed and 8 years or less education had less than 5 responses per cell.

Preliminary Data Analysis

Instrument Reliability

Prior to beginning data analysis to answer research questions, the reliability estimates of the two main measures were evaluated. The two instruments, the Body Image Scale, and the QLI and each of the subscales, were evaluated using Cronbach's alpha as a model of internal consistency. Reliability estimates were obtained for the Body Image Scale and the QLI overall, and each of the subscales (Health and Functioning [HFSUB], Psychological/spiritual [PSPSUB], Social and economic [SOCSUB], and Family [FAMSUB]).

Reliability of QLI

Calculation of Cronbach's alpha on the QLI and social and economic subscale was somewhat problematic due to the large numbers of cases with missing data. Listwise deletion reduced the number of cases to unacceptably low levels for the overall QLI and SOCSUB. Analysis of missing data revealed a pattern: the two items referent to employment had large numbers of missing data. Missing data for item 21 (having a job) totaled 68% and 64%, for satisfaction and importance, respectively; missing data for item 22 (not having a job) totaled 64% and 22.7%, for satisfaction and importance, respectively. Responses to the two items were used in the scoring of the overall QLI and the SOCSUB. The responses to items 21 and 22 were examined for consistency, given that the two items were mutually exclusive. There was, however, no reliable pattern of consistency identified: many participants responded to both, or neither, choice. Therefore, a decision was made to delete the two items referent to employment. The reliability

coefficient for the overall scale was essentially unchanged by the deletion of the two items; however, the reliability coefficient was decreased for SOCSUB with the deletions (see Table 2).

TABLE 2. Comparison of QLI and SOCSUB Reliability Coefficients

Instrument	n	Cronbach's Alpha
Overall QLI		
31 items	15	.96
33 items	70	.95
SOCSUB		
6 items	98	.77
8 items	19	.90

Analysis revealed acceptable reliability coefficients for the overall scale and each of the subscales: QLI (with items 21 and 22 deleted) was .95; Health and Functioning was .908; Social and Economic (with items 21 and 22 deleted) was .771; Psychological/spiritual was .926; and Family was .769.

Reliability of Body Image Scale

Calculation of the reliability co-efficient for the BIS was also somewhat problematic. Item 10 "Have you been dissatisfied with the appearance of your scar" was only applicable for those participants for whom prostatectomy was the treatment. Thus, for most of the sample (n = 108) "not applicable" was the appropriate choice. However, "not applicable" was not clearly delineated as a choice; many participants, without a prostatectomy scar, checked the square indicating "not at all". A decision was made to score "not applicable" as equivalent to "not at all". Cronbach's alpha for the BIS (with item #10 "not applicable" coded as "0") was .89.

Sample Grouping

The second step in data analysis was revision of how the sample would be grouped for purposes of data analysis. In the original proposal, 5 groups were planned, based upon treatment: (a) prostatectomy, (b) radiation therapy, (c) primary hormonal therapy, (d) salvage hormonal therapy, and (e) watchful waiting. However, during recruitment, the participants did not fall clearly into the predetermined groupings. There was an almost universal application of ADT, with more variability in the sequencing of ADT than was expected. However, there was a clear distinction between men who had received ADT versus those who had never received ADT (termed ADT-naïve).

Those in the ADT group had received this therapy in diverse patterns: (a) as primary therapy, intermittent or continuous, (b) as salvage therapy, intermittent or continuous; (c) concomitantly as part of radiation therapy, and (d) prior to prostatectomy. In addition, the participants were captured at different phases of treatment: (a) while “on” ADT or “off” ADT if receiving intermittent ADT, or (b) while receiving ADT in anticipation of and prior to radiation, during radiation, or for a variable period of time after the completion of radiation. The effects of ADT were likely to be consistent, regardless of the treatment pattern, supporting analysis with ADT (ever-ADT) versus those who were ADT-naïve.

Preliminary analysis was performed to assess whether the ever-ADT group differed from the ADT-naïve group. Analysis using t-test for age, and Chi Square for the remaining demographic variables (race, ethnicity, education, employment and marital status) determined the equivalence of the two groups. The ever-ADT group composed

65.9% of the sample (n = 87); The ADT-naïve group composed 34.1% of the sample (n = 45). (See Table 3).

TABLE 3. Demographic Data Group Comparisons

Variable	Ever-ADT (n = 87)	ADT-naïve (n = 45)
Age		
Range	60 -91	60-88
Mean	74	71.73
SD	7.93	7.21
Marital Status		
Married	48 (55.2%)	26 (57.8%)
Never Married	3 (3.4%)	2 (4.4%)
Widowed	18 (20.7%)	7 (15.6%)
Divorced	18 (20.7%)	9 (20%)
Widowed/divorced	0 (0%)	1 (2.2%)
Ethnicity		
American Indian	3 (3.4%)	0 (0%)
African American	11 (12.6%)	5 (11.1%)
Hawaiian	1 (1.1%)	0 (0%)
White	68 (78.2%)	38 (84.4%)
Refuse	4 (4.6%)	1 (2.2%)
Missing	0 (0%)	1 (2.2%)
Employment		
Retired	70 (80.5%)	29 (64.4%)
Full-time	6 (6.9%)	3 (6.7%)
Part-time	10 (11.5%)	11 (24.4%)
Unemployed	1 (1.1%)	2 (4.4%)
Education		
8 years or less	7 (8%)	1 (2.2%)
9-11 years	9 (10.3%)	6 (13.3%)
High school	35 (40.2%)	15 (33.3%)
13-15 years	24 (27.6%)	17 (37.8%)
16 or greater	12 (13.8%)	6 (13.3%)
Stage at Diagnosis		
Stage 1	0 (0%)	1 (2.2%)
Stage 2	35 (40.2%)	29 (64.4%)
Stage 3	20 (23%)	4 (8.9%)
Stage 4	11 (12.6%)	0 (0%)
Unknown	21 (24.1%)	11 (24.4%)

Assumptions of Parametric Tests

The last preliminary analysis was performed to assess the normality, linearity and independence of the variables age, BMI, duration of ADT (ever-ADT), and each of the scale scores (BIS, QLI, HFSUB, SOCSUB, PSPSUB, FAMSUB). Age was the only variable which met the assumptions of the parametric tests. Therefore, transformation of the variables was attempted. We were able to achieve normality with the cubed transformation of the QLI scores and the squared transformation of the HFSUB scores. Normality was more closely approximated using the square root of the BIS scores, duration of therapy and BMI variables; and by square of the SOCSUB, PSPSUB and FAMSUB scores. These transformed variables were used in the analyses with inferential statistics, although we did violate some of the assumptions of parametric tests (i.e., normality).

Data Analysis to Answer Research Questions

Research Question 1: Body Image Change

Research Question 1, “Is there a perceived change in body image in men with prostate cancer?” was analyzed using descriptive statistics. The range of possible scores on each item was “0” (not at all) to “3” (very much), yielding a total score range of 0 – 30, with higher scores denoting increased negative change or dissatisfaction with body image. The mean score for the sample was 6.13 (sd = 6.49). The highest means were achieved on the items referent to a perceived change in sexual attractiveness (1.15), masculinity (.91), feeling less whole (.9) and dissatisfaction with one’s body (.77). Although no clinical threshold of body image dissatisfaction has been identified, the

mean score of 6, in this sample, indicates little negative body image change on this scale (see Table 4).

TABLE 4. Total and Items Scores on Body Image Scale^a

Item	N	Min-Max	Mean	SD
Self-conscious about appearance	131	0 - 3	.5725	.83233
Less physically attractive	131	0 - 3	.6412	.98503
Dissatisfied with appearance when dressed	131	0 - 3	.4427	.75611
Less masculine	131	0 - 3	.9084	1.04108
Difficult to look at oneself naked	131	0 - 3	.4046	.82068
Less sexually attractive	130	0 - 3	1.1538	1.19080
Avoidance of people because of appearance	131	0 - 3	.1985	.60025
Feeling less whole	130	0 - 3	.9000	1.08442
Dissatisfied with body	131	0 - 3	.7710	.98890
Dissatisfied with appearance of scar	130	0 - 2	.1803	.30588
TOTAL BIS	128	0 - 27	6.1328	6.49212

^a Non transformed scores

Body Image Change and Treatment

Research question 1a “Is there a difference in perceived change in body image related to treatment in men with prostate cancer?” was calculated using the t test. The independent-samples t-test was calculated comparing the mean scores of the participants who received ADT as part of their therapy with those participants who were ADT-naïve. Analysis for differences in scores for perceived body image found a significant difference between the means of the two groups ($t(126) = -2.623, p = .01$). The mean of the ever-ADT group was higher ($m = 2.23, sd = 1.44$) than the mean of the ADT-naïve group ($m = 1.52, sd = 1.44$). The higher scores indicated more negative changes in body image among men receiving ADT than the ADT-naïve sample.

Body Image Change and Age

Research question 1b, “Is there a relationship between perceived change in body image and age in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between BIS score and age for the total sample. There was no significant correlation between perceived change in body image and age $r(126) = -.146, p = .100$. The lack of correlation was similar for the ever-ADT group ($r(83) = -.175, p = .110$) and the ADT-naïve group ($r(41) = -.237, p = .126$).

Body Image Change and Duration of Therapy

Research question 1c was “Is there a relationship between perceived change in body image and duration of therapy in men with prostate cancer?” Duration of therapy was measured in months. The range was 240 months, reflecting a duration of therapy from zero (one injection only) to 240 months. The mean duration of ADT was 40.5 months. There was no correlation between perceived change in body image and duration of therapy in those men receiving ADT ($r(83) = .166, p = .130$).

Body Image Change and BMI

Research question 1d, “Is there a relationship between perceived change in body image and BMI in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between BIS score and BMI. BMI means were similar for the sample overall, the ever-ADT group and the ADT-naïve group: 28.55, 28.51 and 28.64, respectively. The range of scores was also similar among the groups: 28 (17 – 45) for the overall sample, 25 (17 -42) for the ever-ADT group, and 24 (21-45) for the ADT-naïve group. There was a statistically significant (positive) correlation between

perceived change in body image and BMI ($r(125) = .174, p = .05$). The greater the BMI, the greater the perception of change in body image. This relationship between BIS and BMI was significant only in the total sample; it was not significant in either the ever-ADT group ($r(82) = .193, p = .079$) or the ADT-naïve group ($r(42) = .169, p = .279$).

Research Question 2: Quality of Life

Research question 2 was, “What is the perceived quality of life in men with prostate cancer?” Data analysis included computation of scores on the QLI overall, and for each domain. QLI scores were calculated using a weighted scale which pairs a satisfaction response with an importance response. The weighted scale calculations yield an overall QOL score, and separate subscale scores for each domain. Scores range from 0-30, with higher scores indicating more satisfactory QOL. There is no clinical threshold for quality of life scores. The lowest mean occurred in the subscale HFSUB (see Table 5)

TABLE 5. Subscale and Total Scores on QLI^a

Scale	Overall Sample	Ever-ADT	ADT-naive
QLI			
n	132	87	45
Mean	22.35	22.00	23.02
SD	5.11	4.87	5.53
Range	23.44	18.86	22.66
HFSUB			
n	132	87	45
Mean	20.70	20.06	21.93
SD	6.08	5.90	6.31
Range	29.25	23.81	28.63
SOCSUB			
n	131 ^b	86 ^b	45
Mean	23.80	23.98	23.44
SD	4.87	4.68	5.24
Range	19.50	18.67	19.50
PSPSUB			
n	129 ^b	85 ^b	44 ^b
Mean	23.23	22.86	23.97
SD	6.19	5.93	6.68
Range	28.93	22.93	28.93
FAMSUB			
n	131 ^b	87	44 ^b
Mean	23.99	23.83	24.32
SD	5.89	5.79	6.12
Range	30	24.00	30.00

^aNon transformed scores. ^bUnable to determine score due to missing values.

Quality of Life and Treatment

Research question 2a, “Is there a difference between perceived QOL related to treatment in men with prostate cancer?” was calculated using the t test. The independent-samples t-test was calculated comparing the mean scores of the participants who received ADT as part of their therapy with those participants who were ADT-naive. No significant difference was found ($t(130) = 1.523, p = .13$). The mean of those men receiving ADT (m

= 12101.69, sd = 6641.91) was not significantly different than the mean for the ADT-naïve ($m = 14032.85$, $sd = 7394.01$). There was no difference in the mean quality of life scores in the two groups.

Quality of Life and Age

Research question 2b, “Is there a relationship between perceived QOL and age in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and age. A Pearson correlation coefficient was calculated examining the relationship between participants’ scores on the QLI and age. No significant correlation was found ($r(130) = .124$, $p = .155$). The lack of correlation was similar for the ever-ADT group ($r(85) = .199$, $p = .065$) and the ADT-naïve group ($r(43) = .050$, $p = .745$).

Quality of Life and Duration of Therapy

Research question 2c, “Is there a relationship between perceived QOL and duration of therapy in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and duration of therapy. A Pearson correlation was calculated examining the relationship between participants’ QLI scores and duration of therapy. There was no significant correlation between quality of life and duration of therapy ($r(85) = -.038$, $p = .726$).

Quality of Life and BMI

Research question 2d, “Is there a relationship between perceived QOL and BMI in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between scores on the QLI and BMI. There was a significant

(negative) relationship found between QOL and BMI ($r(129) = -.174, p = 0.47$). The greater the BMI the less satisfactory one's QOL. This relationship between BIS and BMI was significant only in the total sample; it was not significant in either the ever-ADT group ($r(84) = -.178, p = .101$) or the ADT-naïve group ($r(43) = -.178, p = .241$).

Research Question 3: Body Image and Quality of Life

Research question 3, “What is the relationship between perceived change in body image and QOL in men with prostate cancer?” was answered by calculation of the Pearson product moment correlation between BIS score and overall QLI score. A moderate negative correlation was found ($r(126) = -.597, p = .01$), indicating a significant linear relationship between the two variables. Those participants with greater perceived negative change in body image had less satisfactory quality of life. This negative relationship was similar for the ever-ADT group ($r(83) = -.571, p = .01$) and the ADT-naïve group ($r(41) = -.620, p = .01$).

Body Image Change and Health and Functioning

Research question 3a, “What is the relationship between perceived change in body image and health and functioning QOL?” was answered by calculation of the Pearson product moment correlation between BIS score and health and functioning (HFSUB) domain score. Analysis revealed a significant, moderate negative correlation ($r(126) = -.600, p = .01$) between BIS and HFSUB scores. Those participants with higher scores, indicating greater perceived negative change in body image had lower scores for quality of life in the health and functioning domain. This negative relationship

was similar for the ever-ADT group ($r(83) = -.567, p = .01$) and the ADT-naïve group ($r(41) = -.618, p = .01$).

Body Image Change and Psychological/Spiritual QOL

Research question 3b, “What is the relationship between perceived change in body image and psychological/spiritual QOL?” was answered by calculation of the Pearson product moment correlation between BIS score and psychological/spiritual (PSPSUB) domain score. A moderate negative relationship was found ($r(123) = -.541, p = .01$), indicating a significant linear relationship between the two variables. Those participants with a greater perceived negative change in body image had less satisfactory quality of life in the psychological/spiritual domain. This negative relationship was similar for the ever-ADT group ($r(81) = -.492, p = .01$) and the ADT-naïve group ($r(40) = -.607, p = .01$).

Body Image Change and Social and Economic QOL

Research question 3c, “What is the relationship between perceived change in body image and social and economic QOL?” was answered by calculation of the Pearson product moment correlation between BIS score and social and economic domain score. The correlation of $r(125) = -.469$ was statistically significant ($p = .01$), indicating that participants with a greater perceived negative change in body image had less satisfactory quality of life in the social and economic domain. This negative relationship was similar for the ever-ADT group ($r(82) = -.487, p = .01$) and the ADT-naïve group ($r(41) = -.481, p = .01$).

Body Image Change and Family QOL

Research question 3d, “What is the relationship between perceived change in body image and family QOL?” will be answered by calculation of the Pearson product moment correlation between BIS scores and scores in the family domain. A statistically significant, negative correlation of -.328 was found ($r(125) = -.328, p = .01$), indicating that those participants with a greater perceived negative change in body image had less satisfactory quality of life in the family domain. This negative relationship was significant only in the ever-ADT group similar for the ever-ADT group ($r(83) = -.358, p = .01$); it was not significant in the ADT-naïve group ($r(41) = -.263, p = .093$).

Additional Findings

Based upon statements offered during the consenting process, there may be additional dimensions of the experience of being treated for prostate cancer that were not captured with the measures used in this study. For example, in response to my introduction regarding my interest in the impact of prostate cancer upon men’s lives, one participant so succinctly stated “Ah, well nothing is ever the same again, is it?” Another stated “Ah, the shot.....you definitely don’t want that.” It is not clear that this emotion, emanating from one’s personal experience of prostate cancer, was captured in a pen-and-pencil questionnaire.

Further, the findings of this study point to the need for exploration of the effect of prostate cancer upon one’s spouse. Fifty-one percent of the participants identified themselves as “very dissatisfied” with their sex life; 33% identified their sex life as “very important”. These statistics, coupled with the realization that 56% of the sample was

married or partnered, speaks loudly to the need for further exploration of the effect of this change upon the spousal relationship. Sixty-seven percent of those who were very dissatisfied were married. Several spouses suggested that they too had experienced changes, and thus, should also participate in the study. I believe prostate cancer, a “couples’ disease”, is deserving of further exploration as such.

Summary

The purpose of this descriptive, exploratory study was to describe changes in body image and quality of life among men with prostate cancer, to describe the relationship between body image and quality of life in men with prostate cancer, and to explore differences in body image and QOL related to treatment, age, duration of therapy and body mass index among men with prostate cancer. A sample of 132 men, receiving care in the urology and/or oncology departments participated in this study. Changes in body image and quality of life were compared among men based upon treatment: those that had received ADT (ever-ADT) and those that were ADT-naïve. The ever-ADT group composed 65.9% of the sample (n = 87); The ADT-naive group composed 34.1% of the sample (n = 45). Relationships were explored between body image change and age, duration of therapy (ever-ADT group) and BMI. Similarly, relationships were explored between quality of life and age, duration of therapy (ever-ADT group) and BMI.

Whether or not one received ADT was correlated with body image change: those men who received ADT had a greater perception of negative change. There was, however, no difference in quality of life between men who received ADT and men who did not.

Neither age nor duration of therapy demonstrated a statistically significant relationship with scores for perceptions of change in body image or quality of life. Correlations were demonstrated with BMI: a higher BMI was associated with both a more negative change in body image and a less satisfactory quality of life. The correlations were similar for body image and quality of life: ($r(125) = .174, p \leq .05$) and ($r(129) = -.174, p \leq .05$), respectively.

The correlation between perception of change in body image and quality of life, and in each domain, was significant. Negative relationships were found between the perception of change in body image and overall quality of life, and in the health and functioning, psychological/spiritual, social and economic, and family domains.

CHAPTER V: DISCUSSION

This study explored the relationship between body image and QOL among men treated for prostate cancer. This chapter will begin with a discussion of the findings, within the context of existing literature. The next sections will discuss implications for practice, strengths and limitations of the study, and recommendations for future studies.

Discussion of Research Findings

This section will discuss findings of each research question, placed within the context of prior studies in the literature regarding body image and quality of life. The first research question explored perceived change in body image in men with prostate cancer, utilizing a 10-item instrument, the BIS, to answer this question. Higher scores are reflective of increased negative change, and dissatisfaction with body image. The responses reflect perceived change as a result of the diagnosis and/or treatment of prostate cancer. This instrument was developed for use as a tool to make comparisons between treatment groups as there is currently no clinical threshold of body image disturbance (Hopwood et al., 2001).

It is instructive, therefore, to compare the scores of participants in this study with each other, and with the scores of participants in other studies using this instrument. The mean score (raw score) obtained for the sample overall, ever-ADT and ADT-naïve groups, respectively, was 6.13, 7.03 and 4.34. The finding of a significant difference between the ever-ADT and ADT-naïve group, with a greater level of body dissatisfaction in the ever-ADT group, is not unexpected. The hypogonadal state induced by ADT leads to sarcopenia, gynecomastia (Sharifi et al., 2005; Thompson et al., 2003), higher fat mass,

reduced upper body strength and poorer sexual function (Basaria et al., 2002) and changes in body composition (Greenspan et al., 2005). The ADT-naïve men are spared the hypogonadal-associated changes in body composition. The findings of a qualitative study by Chapple and Ziebland (2002) reflect these changes: men who had received hormonal therapy reported a profound effect upon body shape and libido.

The mean scores obtained in this study do not differ markedly from other studies in which this instrument has been used. Initial psychometric testing of this instrument in a heterogeneous sample of 276 British patients with cancer revealed means ranging from 6.06 – 13.67. Further testing of this instrument compared scores, in women with breast cancer, based upon surgical approach (wide local excision [WLE], mastectomy [Mx] (Hopwood et al., 2001). Additionally, this instrument has been used to compare women who had undergone prophylactic bilateral mastectomy, at a minimum of 6 months post-operatively (Hopwood et al., 2000) and women post abdominal, vaginal or laparoscopic hysterectomy (Stead, Fountain, Napp, Garry & Brown, 2004). Table 6 provides further detail regarding the mean scores obtained in previously published studies.

TABLE 6. BIS Score Comparisons

Sample	Mean Score
Hysterectomy ^a	
Abdominal	5.3
Vaginal	2.8
Laparoscopic	3.6
Prophylactic Bilateral Mastectomy ^b	5.1
Heterogeneous Group Cancer ^c	7.78
Breast Cancer	8.07
Large Bowel	7.89
Testes	6.06
Gynecological	7.67
Lymphoma	13.67
Breast Cancer Post Surgery ^c	7.64
Wide local excision (WLE)	4.27
Mastectomy (MX)	14.22

^a Stead et al., 2004. ^b Hopwood et al., 2000. ^c Hopwood et al., 2001.

Though the BIS scores may be meaningful only in a comparative sense, Hopwood (2000) suggests that a score greater than 10 be used as a clinical cut-off indicating dissatisfaction with body image. In this scenario, those with scores greater than 10 may warrant further assessment. Mean scores obtained in this study ranged from 4 – 7, perhaps indicating a minimal level of negative change in body image in this sample. However, about 25% of the full sample, 14% of the ADT-naive and 27% of the ever-ADT participants scored ≥ 10 . Thirty-nine percent of the ADT-naive BIS scores reflected no perception of body image change, as indicated by an overall score of “0”; only 16% of the ever-ADT group obtained an overall score of zero. The findings suggest the presence of a meaningful degree of body image disturbance overall in men with prostate cancer, but to a greater degree among men who had received ADT.

Similarly, when evaluating an instrument-obtained measure of QOL in this population, it is important to remember that a clinical threshold for QOL does not exist. QOL measures are useful when applied as a tool for discrimination, prediction or evaluation (King, 2003). As used in this study, QLI was applied as a measure of discrimination: no difference was found between groups of men with prostate cancer based upon treatment with ADT versus ADT-naïve. This finding is somewhat surprising, based upon previous research. Basaria et al. (2002) found lower quality of life scores among men receiving ADT when compared with men with prostate cancer not receiving ADT, and healthy age-matched controls. Herr and O'Sullivan (2002) reported a lower overall quality of life among men who received ADT when compared with men who deferred therapy. Findings from a study by Andel and Kurth (2003) support such findings: men receiving ADT had lower scores on the HRQOL, compared with patients receiving no therapy. The lack of congruence with the previous findings may be a result of the composition of the ever ADT group. As discussed in chapter 4, there was much diversity of ADT administration and it is possible that this has confounded the findings.

Neither age nor duration of therapy (measured in months) was found to be related to either body image or quality of life, in this sample. The nonsignificant correlation between age and duration of therapy was somewhat unexpected. When age and body image were examined in men with breast cancer, altered body image was found to affect younger men with breast cancer to a greater degree than older men (Iredale et al., 2006). Age was also negatively related to greater body image disturbance in women with breast cancer (Hopwood, 2001). Holly, Kennedy, Taylor and Beedie (2003) also reported a

negative correlation between age and body image disturbance in a sample of women with breast cancer. However, in the Iredale study, the mean age was 67.3 with a range of 27 – 88. The mean age and range in the Hopwood study was not cited, however, the sample was split at age 55, in order to explore differences. The mean age of women (N = 64) in the Holly study was 52, with a range from 32 – 74. It is possible that the inclusion criteria of age ≥ 60 , operant in the present study, may have been without enough variability to adequately evaluate the effect of age. The findings of a study by Janelli (1992) support this line of thinking: there were no significant differences in body image based upon age in those men aged 60 – 74 and 75 and older.

There have been few studies that have explored body image in men, and in particular, aging men. Most of the studies on body image have been in young, college aged students. Franzoi and Koehler (1998) explored differences in body image satisfaction among men and women, with gender and age as variables. The mean age of the younger participants (n = 132) was 19 years; the mean age of the elderly participants (n = 142) was 73.6 years. Findings supported the existence of a (a) more positive body image in men, generally, when compared to women; (b) more positive body image among young men when compared to older men; and (c) less prominent differences in body image satisfaction when comparing older men and older women. This, however, was believed to be secondary to changes in body satisfaction (less negative) among elderly women. There remains a large gap in our knowledge of the interaction between age and body image satisfaction in men.

There was no relationship between duration of therapy and either body image, or QOL, in this sample. The lack of relationship between duration of therapy and QOL is consistent with the findings of Dacal et al. (2006): There were no significant differences in HRQOL based upon short- (<6 months) or long-term (>6 months) ADT.

There are no studies, to this researcher's knowledge, in which duration of therapy has been explored in relation to the perception of body image. Greenspan et al. (2005) documented maximal deleterious effects of ADT upon body composition within the first year. However, the effect of these changes in body composition upon participants' body image was not examined. One can only theorize the effect of duration: longer duration has less a correlation with body image and QOL due to adaptation; or, new onset ADT has a correlation with body image and QOL due to the noticeable and novel effects upon body composition. This topic is worthy of further exploration, especially given the trend toward intermittent therapy. An additional consideration is, again, the diversity of ADT administration in the ever-ADT group. This heterogeneity within the ever-ADT group may have served to obscure any effect of duration of therapy upon BI or QOL.

Contrary to expectations, in this sample, BMI was not significantly greater in the ADT group; in fact, the mean BMI scores were almost identical: 28.51 in the ever-ADT group and 28.64 in the ADT-naive group. Additionally, it is important to remember that BMI is only an estimate of body composition. Studies have demonstrated that BMI is age and sex dependent, with older people tending to have more body fat, at comparable BMI, than younger adults (Gallaher et al., 1996). Thus, BMI may have underestimated adiposity this sample.

The mean scores for the overall QLI, and each of the subscales was > 23 , with the exception of the health and functioning subscale (HFSUB). Remembering that there is no clinical threshold for QOL, the scores would seem to indicate a somewhat satisfactory QOL in this sample. Interestingly, the health and functioning subscale mean was the lowest among those measured. This may well be a function of an older population, with combined co-morbidities. Almost half of the sample ($n = 60$) received ADT as part of salvage or primary therapy. ADT is given as primary therapy in the setting of advanced disease, or in the presence of significant co-morbidities which preclude more aggressive therapy; ADT is given as salvage therapy after the failure of primary therapy.

The greatest impact of this study may rest in the findings of the relationship between increased negative change in body image and QOL, and with each domain of QOL. The negative correlation between dissatisfaction with body image and QOL was consistent across both groups: $r(41) = -.620, p = .01$ and $r(83) = -.571, p = .01$, for the ADT-naïve and ever-ADT, respectively. Moderate negative relationships were found between body image and overall QOL, and in the domains of health and functioning and psychological/spiritual, and low negative relationships were found with social and economic and family domains. The social and economic domain included items referent to employment; and the family domain included items reference to spouse/lover/partner. Missing data within those subscales may have weakened evidence of existing relationships. Additionally, the poorest reliability for the instrument occurred in those subscales.

The findings of a relationship between QOL and body image support the urgings of Hopwood and the EORTC, and Pruzinsky and Cash (2002) to include body image assessment in QOL measures. The findings of this study support those of the only 2 studies which have investigated body image and QOL among men treated for prostate cancer. Clark et al. (1997) documented the need for inclusion of body image in the assessment in QOL in men with prostate cancer. Fowler et al.(2002) following from the work of Clark, included body image concerns in a multi-item measure of QOL among men with prostate cancer. Significant decrements associated with ADT were found in all seven measures. Findings from both of those studies support the importance of body image in the assessment of QOL in men with prostate cancer.

Not surprisingly, an additional finding which emerges from this data is the degree of change in sexuality and masculinity experienced by men with prostate cancer. The findings of this study lend support to the assertion that prostate cancer affects body image through sexuality and masculinity: over 50% of the participants indicated a negative change in sexuality (54%) and masculinity (57%) as a result of the diagnosis and/or treatment of prostate cancer. This inclusion of sexuality and masculinity in a measure of body image is consistent with the model offered by Mock (1993) wherein sexuality is conceptualized as a component of body image. Responses on the QLI are congruent: 51% of the participants admitted to being “very dissatisfied” with their sex lives. What is clear from the data is that men with prostate cancer, in this sample, experience (a) dissatisfaction in the areas of perceived sexual attractiveness and masculinity as indicated

on the BIS; and (b) a great degree of dissatisfaction with one's sex life, as indicated on the QLI.

Implications for Practice

The findings of this study add to the scant body of knowledge regarding body image and quality of life among men with prostate cancer, and thus begin to provide a foundation for the development of evidence-based interventions, designed to improve the quality of life among men with prostate cancer. The findings support (a) the existence of a negative change in the perception of one's body image, which occurs to a greater degree in the men receiving ADT; and (b) the greater the perception of a negative change in body image the less satisfactory is one's perceived QOL.

The findings lend support to the importance of assessment of body image disturbance in men with prostate cancer, as it had a relationship with quality of life in this population. Additionally, the findings provide some preliminary support for the use of the Body Image Scale as an assessment tool. Furthermore, it may well serve as a tool for the evaluation of interventions which may mitigate this disturbance among men with prostate cancer.

Strengths and Limitations

This section presents both the strengths and limitations of this study. The strengths of the study include sample characteristics and instrument reliability estimates. The limitations of the study include sample size, the use of a convenience sample, composition of the treatment groups, problems with instruments, and violations of assumptions of the statistical tests.

The participants' demographics closely mirrored the racial and ethnic profile of the national veteran population (Non-Hispanic White 75% v 80.3%), however, this racial and ethnic composition is not representative of the population with prostate cancer, in which the highest incidence rates occur among African American men (Jemal et al., 2006). This sample was composed of only 12% African American men. Additionally, sample demographics were not obtained for those men not in the study (i.e., by failure to invite, or by refusal). Those who chose to participate may be very different than those who declined participation.

Although both of the instruments (BIS, QLI) used in the study were highly reliable (Cronbach's alpha at ≥ 0.89), missing data on the QLI made this instrument somewhat problematic. Missing data was $>10\%$ on items referent to children (17.4% and 12%, satisfaction and importance), spouse/lover/partner (18.9% and 17.4%, satisfaction and importance), job (68.2% and 64.4%, satisfaction and importance), and not having a job (22% and 22.7%, satisfaction and importance). The sample demographics might explain some of the missing data: the sample was composed of a great many men without partners (44%) and without employment (77%).

The missing data also illuminates some of the limitations of self-report questionnaires. These limitations include missing and inconsistent responses and (i.e., items referent to employment), and misunderstood directions. There is a cognitive factor which is of great importance in self-report questionnaires. Though the questionnaire was written at a 4th grade level, participants had difficulty understanding some of the

questions, given the frequency with which mutually exclusive items (satisfaction with job and satisfaction not having a job) were both answered (or both omitted).

The context in which the questionnaires were completed was not completely uniform: Several of the participants completed the instrument in the presence of a spouse, and therefore, their responses may have been influenced by this factor. An additional influence might have been the familiarity with the researcher. Although every attempt was made for the researcher to “step out” of her provider role, certainly, on the part of the patient, this was likely not totally achieved. Thus, there was likely some influence of social desirability. Additionally, the length of the QLI may have encouraged a response set bias, or engendered responder fatigue.

An additional limitation of this study was the lack of consideration given to possible confounding variables which may have exerted an influence upon QOL in this sample. This sample was composed of older men, thus co-morbid factors may have strongly influenced QOL assessments. This was not captured in the data.

Future Studies

The findings of this study serve as a foundation for future studies, and provide support for further exploration of body image and quality of life among men with prostate cancer. The findings warrant further exploration for variables which interact to modify or mediate this relationship, in a larger, more representative sample.

Because the presence of co-morbidities may have exerted a strong influence upon QOL, future studies should capture this information in data collection. Recommendations for future studies would include collecting data regarding the presence of significant co-

morbidities in order to evaluate the effect upon QOL. Additionally, recommendations for future studies include recruitment of a younger, more diverse sample. This might illuminate differences related to age, race, and ethnicity. Such samples might be designed to more closely reflect the racial profile of prostate cancer.

The QLI served to be somewhat problematic in this study. Though a self-report instrument, the addition of clearer directions might help reduce some of the missing and inconsistent data apparent in this sample. Alternatively, an instrument which has been developed for use in an aging population might be a more appropriate measure of QOL.

The BIS was also not without some problems with clarity. The instrument might be re-formatted to enable the participant to choose “not applicable” more appropriately.

Future studies might compare body image and QOL in more homogeneous groupings: the ever-ADT group composed only of men receiving ADT neoadjuvantly, in conjunction with radiation therapy; the ADT-naïve group composed of men receiving only radiation therapy. This group distinction might better illuminate differences due to ADT.

Summary

The findings of this study describe body image and QOL, the relationship of age, treatment with ADT, BMI and duration of ADT therapy upon these perceptions, and the relationship between body image and QOL among men with prostate cancer. The findings lend support to a greater degree of negative change among men receiving ADT as compared to ADT-naïve men; additionally, the findings lend support to an inverse relationship between dissatisfaction with body image and QOL. Additional findings

which emerged from the data included dissatisfaction with one's sex life, and negative changes in the perceptions of masculinity and sexual attractiveness. These findings add to the scant body of knowledge regarding body image and quality of life among men with prostate cancer, and thus begin to provide a foundation for future research endeavors, and the development of evidence-based interventions, designed to improve the quality of life among men with prostate cancer.

APPENDIX A
LETTERS OF PERMISSION

Dear Ms. Harrington,

I am happy to grant you permission to use the Quality of Life Index for your dissertation study. Copies of the instrument, psychometrics, scoring directions and scoring programs, and a listing of studies that have used the QLI can be found on the website at www.uic.edu/orgs/qli

I wish you all success.

Sincerely,

Carol Estwing Ferrans, PhD, RN, FAAN
Deputy Director, UIC Center for Population Health and Health Disparities
Professor, College of Nursing
University of Illinois at Chicago
845 S. Damen Avenue (MC 802)
Chicago, IL 60612
Phone (312) 996-8445
Fax (312) 996-4979

QLI website: www.uic.edu/orgs/qli

Dear Joanne

You are welcome to use the BIS -copy attached. It has mainly been used in the breast cancer field so I am delighted you are planning to use it in men with prostate cancer. Good luck with your study.

If you require any further info, please get back to me again.

Best wishes

Penny

Dr Penelope Hopwood

Lead Consultant & Honorary Senior Lecturer in Psychiatry & Psycho-Oncology

Christie Hospital NHS Trust

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Manchester M20 4BX

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APPENDIX B
IRB APPROVAL

THE UNIVERSITY OF
ARIZONA
 TUCSON ARIZONA

Human Subjects Protection Program

1235 N. Mountain Avenue
 P.O. Box 245137
 Tucson, AZ 85724-5137
 (520) 626-6721
<http://www.irb.arizona.edu>
 May 17, 2007

Joanne Harrington, RN, MSN
 Advisor: Elaine Jones, PhD, RN
 School of Nursing
 1305 N. Martin
 P.O. Box 210203

BSC: B07.168 BODY IMAGE AND QUALITY OF LIFE AMONG MEN WITH PROSTATE CANCER

Dear Joanne Harrington:

We received your research proposal as cited above. The procedures to be followed in this study pose no more than minimal risk to participating subjects and have been reviewed by the Institutional Review Board (IRB) through an Expedited Review procedure as cited in the regulations issued by the U.S. Department of Health and Human Services [45 CFR Part 46.110(b)(1)] based on their inclusion under *research category 7*. As this is not a treatment intervention study, the IRB has waived the statement of Alternative Treatments in the consent form as allowed by 45 CFR 46.116(d)(2). Although full Committee review is not required, a brief summary of the project procedures is submitted to the Committee for their endorsement and/or comment, if any, after administrative approval is granted. This project is approved with an **expiration date of 17 May 2008**. Please make copies of the attached IRB stamped consent documents to consent your subjects.

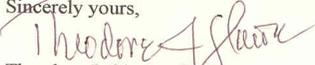
The Institutional Review Board (IRB) of the University of Arizona has a current *Federalwide Assurance* of compliance, **FWA00004218**, which is on file with the Department of Health and Human Services and covers this activity.

Clearance from official authorities for sites where proposed research is to be conducted must be obtained prior to performance of this study at those sites. Evidence of this must be submitted to the Human Subjects Protection Office.

Approval is granted with the understanding that no further changes or additions will be made to the procedures followed without the knowledge and approval of the Human Subjects Committee (IRB) and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

A university policy requires that all signed subject consent forms be kept in a permanent file in an area designated for that purpose by the Department Head or comparable authority. This will assure their accessibility in the event that university officials require the information and the principal investigator is unavailable for some reason.

Sincerely yours,



Theodore J. Glatke, PhD
 Chair, Social and Behavioral Sciences Human Subjects Committee

TJG/rkd

Cc: Departmental/College Review Committee

APPENDIX C
DATA COLLECTION INSTRUMENTS

Socio-demographic Data

Age _____

What is your marital status?

Married or partnered _____

Never married Single _____

Widowed _____

Divorced _____

What race do you consider yourself to be?

American Indian or Alaska Native _____

Asian _____

Black or African American _____

Native Hawaiian or other Pacific Islander _____

White _____

Refuse _____

Are you of Hispanic origin?

Yes _____

No _____

What is your employment status?

Retired _____

Working full-time _____

Working part-time _____

Unemployed _____

What is the highest level of formal education you have reached?

8 years or less _____

9-11 years _____

High school or GED _____

13-15 years _____

16 or greater _____

Disease-related Information

Date of Diagnosis	
Stage at Diagnosis	
Initial Treatment	
Date of initial treatment	
Initial LHRH injection	
Duration of LHRH injections (months)	
BMI	
Diagnosis of dementia	

Body Image Scale

In this questionnaire, you will be asked how you feel about your appearance, and about any changes that may have resulted from your disease or treatment. Please read each item carefully, and place a check on the line alongside the reply which comes closest to the way you have been feeling about yourself, during the past week.

	Not at all	A little	Quite a bit	Very Much
Have you been feeling self-conscious about your appearance?				
Have you felt <u>less</u> physically attractive as a result of your disease or treatment?				
Have you been <u>dissatisfied</u> with your appearance when dressed?				
Have you been feeling <u>less</u> feminine/masculine as a result of your disease or treatment?				

Did you find it difficult to look at yourself naked?				
Have you been feeling less sexually attractive as a result of your disease or treatment?				
Did you avoid people because of the way you felt about your appearance?				
Have you been feeling the treatment has left your body less whole?				
Have you felt dissatisfied with your body?				
Have you been dissatisfied with the appearance of your scar?				
	Not applicable			

Ferrans and Powers
QUALITY OF LIFE INDEX®
CANCER VERSION - III

PART 1. For each of the following, please choose the answer that best describes how *satisfied* you are with that area of your life. Please mark your answer by circling the number. There are no right or wrong answers.

HOW SATISFIED ARE YOU WITH:	Very Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied
1. Your health?	1	2	3	4	5	6
2. Your health care?	1	2	3	4	5	6
3. The amount of pain that you have?	1	2	3	4	5	6
4. The amount of energy you have for everyday activities?	1	2	3	4	5	6
5. Your ability to take care of yourself without help?	1	2	3	4	5	6
6. The amount of control you have over your life?	1	2	3	4	5	6
7. Your chances of living as long as you would like?	1	2	3	4	5	6
8. Your family's health?	1	2	3	4	5	6
9. Your children?	1	2	3	4	5	6
10. Your family's happiness?	1	2	3	4	5	6
11. Your sex life?	1	2	3	4	5	6
12. Your spouse, lover, or partner?	1	2	3	4	5	6
13. Your friends?	1	2	3	4	5	6
14. The emotional support you get from your family?	1	2	3	4	5	6
15. The emotional support you get from people other than your family?	1	2	3	4	5	6

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HOW SATISFIED ARE YOU WITH:	Very Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied
16. Your ability to take care of family responsibilities?	1	2	3	4	5	6
17. How useful you are to others?	1	2	3	4	5	6
18. The amount of worries in your life?	1	2	3	4	5	6
19. Your neighborhood?	1	2	3	4	5	6
20. Your home, apartment, or place where you live?	1	2	3	4	5	6
21. Your job (if employed)?	1	2	3	4	5	6
22. Not having a job (if unemployed, retired, or disabled)?	1	2	3	4	5	6
23. Your education?	1	2	3	4	5	6
24. How well you can take care of your financial needs?	1	2	3	4	5	6
25. The things you do for fun?	1	2	3	4	5	6
26. Your chances for a happy future?	1	2	3	4	5	6
27. Your peace of mind?	1	2	3	4	5	6
28. Your faith in God?	1	2	3	4	5	6
29. Your achievement of personal goals?	1	2	3	4	5	6
30. Your happiness in general?	1	2	3	4	5	6
31. Your life in general?	1	2	3	4	5	6
32. Your personal appearance?	1	2	3	4	5	6
33. Yourself in general?	1	2	3	4	5	6

(Please Go To Next Page)

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PART 2. For each of the following, please choose the answer that best describes how *important* that area of your life is to you. Please mark your answer by circling the number. There are no right or wrong answers.

HOW IMPORTANT TO YOU IS:	Very Unimportant	Moderately Unimportant	Slightly Unimportant	Slightly Important	Moderately Important	Very Important
1. Your health?	1	2	3	4	5	6
2. Your health care?	1	2	3	4	5	6
3. Having no pain?	1	2	3	4	5	6
4. Having enough energy for everyday activities?	1	2	3	4	5	6
5. Taking care of yourself without help?	1	2	3	4	5	6
6. Having control over your life?	1	2	3	4	5	6
7. Living as long as you would like?	1	2	3	4	5	6
8. Your family's health?	1	2	3	4	5	6
9. Your children?	1	2	3	4	5	6
10. Your family's happiness?	1	2	3	4	5	6
11. Your sex life?	1	2	3	4	5	6
12. Your spouse, lover, or partner?	1	2	3	4	5	6
13. Your friends?	1	2	3	4	5	6
14. The emotional support you get from your family?	1	2	3	4	5	6
15. The emotional support you get from people other than your family?	1	2	3	4	5	6

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HOW IMPORTANT TO YOU IS:	Very Unimportant	Moderately Unimportant	Slightly Unimportant	Slightly Important	Moderately Important	Very Important
16. Taking care of family responsibilities?	1	2	3	4	5	6
17. Being useful to others?	1	2	3	4	5	6
18. Having no worries?	1	2	3	4	5	6
19. Your neighborhood?	1	2	3	4	5	6
20. Your home, apartment, or place where you live?	1	2	3	4	5	6
21. Your job (if employed)?	1	2	3	4	5	6
22. Having a job (if unemployed, retired, or disabled)?	1	2	3	4	5	6
23. Your education?	1	2	3	4	5	6
24. Being able to take care of your financial needs?	1	2	3	4	5	6
25. Doing things for fun?	1	2	3	4	5	6
26. Having a happy future?	1	2	3	4	5	6
27. Peace of mind?	1	2	3	4	5	6
28. Your faith in God?	1	2	3	4	5	6
29. Achieving your personal goals?	1	2	3	4	5	6
30. Your happiness in general?	1	2	3	4	5	6
31. Being satisfied with life?	1	2	3	4	5	6
32. Your personal appearance?	1	2	3	4	5	6
33. Are you to yourself?	1	2	3	4	5	6

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APPENDIX D
AJCC STAGING PROSTATE CANCER

Primary Tumor (T)

- Tx: Primary tumor cannot be assessed
- T0: No evidence of primary tumor
- T1: Clinically inapparent tumor not palpable nor visible by imaging
 - T1a: Tumor incidental histologic finding in $\leq 5\%$ of tissue resected
 - T1b: Tumor incidental histologic finding in $>5\%$ of tissue resected
 - T1c: Tumor identified by needle biopsy (e.g. because of elevated PSA)
- T2: Tumor confined within prostate
 - T2a: tumor involves 50% of ≤ 1 lobe or less
 - T2b: Tumor involves $>50\%$ of 1 lobe but not both lobes
 - T2c: Tumor involves both lobes
- T3: Tumor extends through the prostate capsule
 - T3a: Extracapsular extension (unilateral or bilateral)
 - T3b: Tumor invades seminal vesicle(s)
- T4: Tumor is fixed or invades adjacent structures other than seminal vesicles: bladder sphincter, rectum, levator muscles, and/or pelvic wall.

Regional Lymph Nodes (N)

- NX: Regional lymph nodes were not assessed
- N0: No regional lymph node metastasis
- N1: Metastasis in regional lymph node(s)

Distant Metastasis (M)

- MX: Distant metastasis cannot be assessed
- M0: No distant metastasis
- M1: Distant metastasis
 - M1a: Nonregional lymph node(s)
 - M1b: Bone(s)
 - M1c: Other site(s) with or without bone disease

Histopathologic grade (G)

- GX: Grade cannot be assessed
- G1: Well-differentiated (slight anaplasia) (Gleason 2-4)
- G2: Moderately differentiated (moderate anaplasia) (Gleason 5-6)
- G3-4: Poorly differentiated or undifferentiated (marked anaplasia) Gleason 7-10

	Tumor	Node	Metastasis	Gleason
Stage I	T1a	N0	M0	G1
Stage II	T1a	N0	M0	G2
	T1b	N0	M0	any G
	T1c	N0	M0	any G
	T1	N0	M0	any G
	T2	N0	M0	any G
Stage III	T3	N0	M0	any G
Stage IV	T4	N0	M0	any G
	any T	N1	M0	any G
	any T	any N	M1	any G

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