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Self-rated health as a tool for estimating health-adjusted life expectancy among patients newly diagnosed with localized prostate cancer: A preliminary study

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Abstract

Purpose—Localized prostate cancer (LPC) patients are faced with numerous treatment options, including observation or watchful waiting. The choice of treatment largely depends on their baseline health-adjusted life expectancy (HALE). By consensus, physicians recommend treatment if the patient's HALE is ten or more years. However, the estimation of HALE is difficult. Although subjective by nature, self-rated health (SRH) is a robust predictor of mortality. We studied the usefulness of SRH in estimating HALE in patients who are considering treatment for LPC.

Methods—A total of 144 LPC patients from a large urology private practice in Norfolk, Virginia, were surveyed before they had chosen a treatment option.

Results—HALE determined by SRH correlated well with objective health measures, and was higher than age-based life expectancy by an average of 2 years. The observed difference in life expectancy due to SRH adjustment was higher among patients with a better socioeconomic and health profile.

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Conclusions—SRH is an easy-to-use indicator of HALE in LPC patients. A table for HALE estimation by age and SRH is provided for men aged 70-80 years. Additional research with larger samples and prospective study designs are needed before the SRH method can be used in primary care and urology settings.

Keywords

Localized Prostate Cancer; Life Expectancy; Self-rated Health; Urology

Introduction

Prostate cancer is the most common cause of cancer death in non-smoking American men; however, whether patients should choose treatment for the cancer is controversial. In the United States, over 94% of patients choose treatment [1]. Due to widespread prostate-specific antigen (PSA) screening, over 90% of patients are diagnosed with localized prostate cancer (LPC). In about three-fourths of patients with screen-detected LPC, treatment may extend survival by only about six weeks [2]. The potentially deleterious effects of treatment on a patient's health-related quality of life (HRQOL) are also well established. Choosing treatment or observation is difficult because no randomized trials have assessed the survival benefit of treatment in screen-detected patients. Central to decision-making is the patient's estimated baseline health-adjusted life expectancy (HALE), because by consensus physicians recommend treatment if the patient's HALE is ten or more years. Algorithms by organizations such as the National Comprehensive Cancer Network (NCCN) are also based on an estimated HALE. Yet, physician estimates of HALE are often imprecise [3] and an error of even a few years in the estimation of HALE could change a decision from treatment to observation or vice versa, because outcomes of treatment and observation are marginal. Several urologic nomograms have been published that simultaneously include co-morbidity scores with cancer and treatment characteristics to predict survival. However, patients and their physicians critically need an independent assessment of baseline HALE with which they can understand how the cancer or its treatment can affect their survival.

LPC is found at autopsy in 15-30% of American men 50 years and older and in 80% of men over 80 years of age [15], whereas one in six men will face a diagnosis of LPC in his lifetime [16]. By contrast, only 3% of men [16] and only one in seven diagnosed Americans will die due to untreated LPC [17]. The choice of treatment or observation depends on many factors including a patient's baseline life expectancy according to age and co-morbidities [18]. With observation, prostate cancer-specific survival was 99.2% after 8 years of follow-up in 299 patients in a Canadian study [17] and 100% after 10 years of follow-up in 616 patients in a multi-center European study [19]. Nevertheless, over 90% of American patients choose treatments that can endanger their HRQOL, at a cost of about \$10 000 to \$25 000 (in 2000 dollars) for each potentially unnecessary prostatectomy or radiotherapy [20]. For 2000-2001, an over-treatment rate of 55% has been reported [21].

Patients diagnosed with LPC choose from a myriad of treatment techniques with marginally different HRQOL outcomes, and without clear numerical probabilities of the frequency, severity, and duration of side-effects. Finding the HRQOL outcome that can best match the patient's preference can eclipse the bigger question of whether any treatment will enhance survival. Dahm et al. [22] have suggested that such complex decision-making should not be left to expert opinion; instead, national guidelines developed by panels of individuals who have devoted the necessary time to balance available evidence, can be used by physicians in order to prevent over- or under-treatment [22]. However, these national guidelines do not appear to be commonly used in selecting a treatment for LPC. Using combinations of search terms and medical subject headings, namely "prostate cancer", "practice guidelines",

“NCCN”, “medical oncology/standards”, “evidence-based practice”, “urology/standards”, and “neoplasms/therapy”, we found several PUBMED articles, none of which implied the use of guidelines for LPC treatment selection. Guidelines typically require a patient’s baseline HALE, PSA level, cancer stage and grade, with HALE being the only undefined factor.

According to McCloskey and Kuttel, HALE cannot be predicted by currently available tools, and its uncertainty may make it difficult to use existing guidelines [23]. Estimates of HALE by urologists and radiation oncologists [3] as well as by primary care providers [24] also had a high margin of error. In one study, 64% of patients felt that their physicians were “unskilled, ill-equipped, and uncomfortable with the task” of estimating HALE [24]. Life expectancy according to age-based life tables cannot be used because co-morbidities are the strongest predictors of longevity in LPC patients [18] and because health is widely heterogeneous in older patients in general [25,26]. In practice, even age-based life tables are not commonly used, and 70-90% of Americans select their treatment option in a single visit to the urologist after a positive biopsy [27].

For over two decades, it has been well known that Self-Rated Health (SRH) is a robust predictor of mortality risk. The correlation of SRH with longevity has been previously published [4]. By virtue of being a single question, SRH is easily self-administered and could serve as a valuable tool for busy physicians to quickly estimate a patient’s HALE, without having to rely on scales that measure co-morbidity or functional capacity. We hypothesized that newly diagnosed LPC patients will have SRH scores that will closely correlate to their co-morbidity and functional capacity scores, and that their estimated survival based on age alone will be significantly different from their estimated HALE based on SRH. If our hypothesis is correct, SRH may be useful for adjusting life expectancy based only on age. Longitudinal studies are needed to further address the predictive validity of SRH among LPC patients.

Methods

Study design and population

A detailed description of the study methodology has been provided elsewhere [5]. Briefly, a survey was conducted in patients who were newly diagnosed with LPC, after they had met with their urologists and before any treatment was performed. Biopsy-diagnosed LPC patients were recruited between March 2005 and October 2007 from a large urology private practice in Norfolk, Virginia. Patients were included if their prostate cancer was localized as implied by a cancer stage of T1a to T2c, irrespective of Gleason grade or severity of co-morbid conditions. They were excluded if they already had curative treatment with either surgery (including cryotherapy) or radiation (including brachytherapy). Patients who were unable to complete the survey because of neurological disorders such as dementia and those who could not read, write, or understand English were also excluded. Urology staff routinely contacted all patients regarding their interest to participate in a mailed survey. Patients who met all eligibility criteria and were willing to part-take in the survey were asked to provide their written informed consent. A \$10 stipend was given to each survey participant. The self-administered questionnaire enquired about patient perceptions of their own health (SRH), co-morbidities, functional capacity, anxiety and depression, social support and other generic and symptom-specific measures of HRQOL. Demographic characteristics were obtained from patient records. The survey methods were approved by the institution’s review board. Surveys were mailed to 430 patients newly diagnosed with LPC, but in 69 the treatment had already been started by the time the patients received the surveys, three never received the surveys and two were found to be ineligible to participate as the cancer was not localized. Of the 356 remaining patients, 104 did not return the survey because they were ‘not interested’

in participating and 68 who did not return the surveys did not give a reason for not participating or could not be contacted. Furthermore, 184 of 356 patients (survey response rate of 52%) completed and returned the first pretreatment survey. 144 out of 184 patients who completed and returned the self-administered questionnaires also had valid SRH data. The mean (\pm standard deviation) age of these patients was 61.8 (\pm 7.1) years and 11.6% were African Americans. Whereas only 2.9% of these patients had not completed high school, 70% had a family income of more than \$50 000.

Measures

Estimation of HALE by self-rated health (SRH)—SRH was evaluated by asking ‘In the last one month, how would you rate your health?’ Possible responses were ‘excellent’, ‘very good’, ‘good’, ‘fair’ or ‘poor’. HALE was calculated using these ratings to weight U.S. annual mortality rates (obtained from life tables for U.S. men [6]) by 0.52, 0.89, 1.0, 1.26, and 1.88 respectively. These weightings were obtained from a five-year follow-up study of 1 437 men older than 65 years who participated in the East Boston Senior Health Project [4] and were asked ‘Compared with others your age, would you rate your overall health as excellent, good, fair or poor?’ Men who indicated that their health was excellent had a lower mortality rate than ‘average’ (health status weight, 0.52), while those who indicated that their health was good, fair or poor had health status weights of 0.89, 1.26 and 1.88, respectively. In our study, LPC patients who indicated that their health was ‘good’ (1.0) were selected as the ‘average’ category, to which ‘excellent’ (0.52), ‘very good’ (0.89), ‘fair’ (1.26) and ‘poor’ (1.88) categories were compared. The main concern during LPC decision-making is whether or not the patient has a HALE of at least 10 years [7]. Applying the aforementioned weighting methodology, LPC patients older than 80 years would have a HALE of less than 10 years, irrespective of their SRH. Similarly, the HALE of LPC patients who are younger than 70 years would exceed 10 years even if they rated their health as “poor”. Thus, using SRH-based weightings [4] and age-based life expectancy in U.S. men [6], we have prepared a reference table of age-based life expectancy and HALE that can be applied in the context of LPC patients, 70-80 years of age (Table 1).

Patient demographic characteristics—Age-based life expectancy and SRH-based HALE and the difference between the two measures were analyzed by the following demographic characteristics: 1) *Age* (< 60 years, 60-70 years, >70 years); 2) *Race* (Caucasian, African American); 3) *Education* (Less than high school, High school, College) and 4) *Family income* (< \$50,000, \geq \$50,000).

Patient health characteristics—Age-based life expectancy and SRH-based HALE and the difference between the two measures were analyzed by the following health characteristics: Gleason grade, PSA level, Charlson comorbidity index (CCI), Duke Activity Status Index (DASI), the Hospital Anxiety and Depression (HAD) scale and the Medical Outcomes Study Social Support Scale (MOS-SSS). Gleason grade was defined as ‘6’, ‘7’ or ‘8+’, while PSA level was dichotomized as ‘ ≤ 10 ’ or ‘ > 10 ’. The CCI is widely used to measure the burden of co-morbid illnesses. We used a patient self-reported CCI which asks about the presence and severity of twelve chronic diseases; this version has been used by the multi-center Prostate Cancer Outcomes Study [8]. Of the twelve diseases, nine are counted only if they need a prescription or if they impact the patient’s life. Self-reported CCI had similar prediction of mortality to that predicted by co-morbidity assessed by a review of medical records of hospitalized patients [9]. The *DASI* scale is used to measure functional capacity and consists of binary questions that ask if a patient can perform twelve different activities with varying weights according to the level of exertion they require [10]. Summary scores obtained from the DASI have been previously correlated with treadmill and six-minute walk test results in cardiac rehabilitation patients [11] and with survival in a large

younger-age population [12]. DASI scores can be expressed in units of oxygen consumption per minute or in Metabolic Equivalents (METS) [10]. We analyzed DASI score as a continuous variable and further categorized it as 'Mild activities (< 3 METS)', 'Moderate activities (3-6 METS)' and 'Vigorous activities (6+ METS)' [10]. The HAD scale is used to evaluate the presence and severity of anxiety and depression and has been extensively validated in geriatric and non-geriatric populations. This 14-item scale includes 7-item sub-scale for anxiety and a seven-item sub-scale for depression [13]. For each sub-scale, the total score can range between 0 and 21. Anxiety and depression sub-scales were analyzed as categorical variables ['0-7 (None)'; '8-10 (Mild)'; '11-14 (Moderate)'; '15-21 (Clinical)']. The MOS-SSS is a validated 19-item scale covering four domains, namely, 'Emotional or Informational Support' (8 items); 'Tangible support' (4 items); 'Affectionate support' (3 items); 'Positive social interaction' (3 items) and one additional item. MOS-SSS scores were transformed to a 0-100 scale and categorized as '<50', '50-<75' and '75-100'[14].

Statistical Analyses

All statistical analyses were performed using SAS software, version 9.1 (SAS Institute Inc., Cary, NC). Frequencies and percentages were used to describe categorical variables. Continuous variables were described using the means and standard deviations. Wilcoxon's signed rank test was used to examine whether the difference between age-based life expectancy and SRH-based HALE was significantly different from zero, before and after stratifying by patient characteristics. The Wilcoxon signed-rank test is used to compare the distributions of two variables (considering both the sign and the magnitude of the differences between pairs) and find whether the difference scores are significantly different from zero (in the population). The Wilcoxon test makes less than maximum use of the data, in that it substitutes ranks for raw score differences. Finally, Spearman rank correlation was used to describe the relationship of SRH with other HRQOL measures. Two-sided statistical tests were conducted and statistical significance was declared at a conservative alpha level of 0.01, to adjust for multiple comparisons.

Results

As shown in Table 2, nearly 95% of our study sample rated their overall health as 'good', 'very good' or 'excellent'. The mean (\pm standard deviation) life expectancy by age alone was 19.7 ± 5.8 years and the mean (\pm standard deviation) HALE based on SRH was 21.6 ± 6.6 years. SRH-based estimate of HALE was significantly higher than the age-based estimate of life expectancy, with a mean difference of 2 years (Wilcoxon signed rank test; $P < 0.05$). As shown in **Tables 3 and 4**, the mean difference between SRH- and age-based life expectancy varied according to patient demographic and health characteristics. SRH-based life expectancy was significantly higher than age-based life expectancy, irrespective of patient age, race, household income or PSA level. By contrast, patient education, Gleason grade, functional capacity, anxiety, depression and social support may be factors that need to be taken into consideration, as they can influence the 'gap' between SRH-based and age-based life expectancy. However, it is important to recognize the limited sample size which often resulted in a standard deviation that was higher than the mean for (SRH-LE – AGE-LE). A close examination suggests that the 'gap' in life expectancy was higher among patients with a better socioeconomic and health profile. The latter finding is supported by the weak association between age and SRH and the stronger correlation of SRH with various health indicators such as PSA level, CCI, DASI and depression (Table 5).

Discussion

The SRH is one of several components of the Centers for Disease Control (CDC) HRQOL-4 definition adopted by the National Health and Nutrition Examination Surveys (NHANES)

and the Behavioral Risk Factor Surveillance Systems (BRFSS). Whereas the NHANES is an ongoing series of cross-sectional surveys designed to be representative of the non-institutionalized, U.S. civilian population by using a complex, multistage probability design, the BRFSS is an ongoing, random-digit-dialed telephone survey of the non-institutionalized, U.S. civilian population aged ≥ 18 years conducted in all 50 states and the District of Columbia. In both surveys, the following HRQOL-4 measures were included: 1) SRH: 'Would you say that in general your health is excellent, very good, good, fair, or poor?'; 2) Physically unhealthy days: 'Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?'; 3) Mentally unhealthy days: 'Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?'; 4) Activity limitation days: 'During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, school, or recreation?' These HRQOL-4 measures, including SRH, were shown to predict morbidity, healthcare utilization and mortality, and were associated with chronic diseases, disability, risky health behaviors, and socio-demographic factors [28].

In this survey of newly diagnosed LPC patients, nearly 5% indicated that their SRH was fair or poor. Furthermore, SRH influenced HALE differentially across groups defined by their demographic, socioeconomic and health characteristics. We analyzed SRH data for older adults (≥ 50 years) from the 2005-2008 NHANES, which corresponds to the time period during which our survey was conducted. In general, over 15% of NHANES participants indicated that their SRH was fair or poor. As shown in Figure 1, non-Hispanic White men representing the vast majority of our study population were least likely to report a fair or poor SRH, compared to other racial and ethnic groups. It is important to note that while the 2005-2008 NHANES enquires about health 'in general', our survey enquires about health in the 'last one month'. Yet, the staggering difference in the SRH distribution among these survey samples cannot be entirely attributed to distinct ways of phrasing the SRH question. It is plausible that our patient population was indeed healthier than the general population of the United States, given that the majority of recently diagnosed LPC patients were non-Hispanic White. A cautionary note is the issue of 'response shift' whereby patients may recalibrate or adjust the internal scale on which they are estimating their health. This has been hypothesized as a possible explanation for the observation that very ill patients often rate their health and/or their HRQOL as good, very good or excellent.

Although subjective in nature, SRH is known to predict mortality and thereby life expectancy as well as and beyond what is predicted by a patient's health record [29]. Our results show that among LPC patients, SRH is independent of age and is a useful tool that can be used to compute HALE. Our results also suggest a significant correlation with modest shared variance between SRH and two objective measures of health, namely CCI and DASI. Therefore, SRH may be as useful as and less cumbersome than measures of comorbidity or physical functioning for estimating HALE in the context of LPC treatment selection. In our cross-sectional study, we did not evaluate whether SRH predicts long-term survival. However, by showing that SRH and CCI/DASI are correlated in LPC patients, our study implies that SRH may be useful for performing health adjustment of age-based life expectancy prior to LPC treatment selection, especially in settings where HALE is not routinely calculated.

Our survey was administered at a critical time, when the patients had just been diagnosed with LPC and had not yet been treated for the cancer. They had met with their urologist, and were actively considering treatment options in this narrow window of time. They would be expected to have done a careful evaluation of their health, and may have made an empiric

calculation of their life expectancy with and without treatment. At such a time, when patients are acutely concerned about their health, SRH appears to be an excellent indicator of health status. SRH-based HALE and age-based life expectancy were found to differ significantly in LPC patients. Thus, weighting by SRH could alter age-based life expectancy by several years. As indicated in the reference table, at age 70, the life expectancy of patients who rate their SRH as “excellent” is 18.9 years as compared to only 9.5 years for patients who those rate their SRH as “poor”. Most of our patients had a high socioeconomic standing and adequate health profile as exemplified by having more than a high school level education, a family income of at least \$50 000, a PSA \leq 10 and a DASI \geq 6 METS [5]. On the other hand, the presence of anxiety or depression could limit the validity of using SRH as an indicator of health status. Just after being diagnosed with cancer, patients are at risk of developing symptoms of anxiety and depression. Mood could potentially reduce the accuracy of SRH in predicting HALE, but SRH has been previously found to be a powerful predictor of life expectancy despite covariates such as depression [30].

Our study had several limitations. First, although the close relationship between SRH and other health indicators suggests that SRH can be used to weight age-based life expectancy, no long-term follow-up has been done in LPC patients to study if SRH does correlate with survival. Second, the survey response rate was 52%. We studied only those patients who had agreed to participate, and they were mostly Caucasian White, below 70 years of age, highly educated with a high family income. Self-selection bias is a plausible explanation for our study findings since these patients could have been healthier, more confident in filling out health surveys, and better able to rate their health. Nevertheless, the profile of our patients may also be typical of those who visit urologists in private practice, and about 80% of urologists in the United States are in private practice [31]. Third, this study is limited in terms of sample size and SRH profile. Out of 144 LPC patients, only 7 (4.9%) reported fair or poor SRH, and the use of SRH HALE generated an increased life expectancy which would increase the number of individuals who receive treatment if this approach was implemented. On the other hand, more favorable SRH scores for the men in this study translated into substantial increases in SRH-adjusted life expectancy, particularly among those in the better functioning clinical subcategories. Given the small samples of men who were categorized into the lowest functioning subcategories, the corresponding SRH-adjusted life expectancy estimates may be questionable. Finally, data used to represent age-adjusted life expectancy were obtained from 2003 vital statistics, weightings used to calculate SRH-adjusted HALE were obtained from a study conducted in 1996 (using vital statistics for the year 1991), while our own study was conducted several years later (2005-2007). Clearly, a larger study with a more advanced design is needed to confirm these preliminary findings.

In this study, SRH-adjusted life expectancy was generally higher than age-based life expectancy by around 2 years, among patients newly diagnosed with LPC. Yet, the ‘gap’ between these two measures of life expectancy was wider in LPC patients who reported better socioeconomic and health characteristics. Although SRH consists of only one item and is easy and quick to self-administer it should not be used as the only basis for clinical decision-making. Table 1 estimates life expectancy based on age alone and after SRH-based adjustment for individuals between 70 and 80 years of age. This table could be used by newly diagnosed LPC patients in this age group and their physicians to obtain an estimate of baseline HALE.

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Abbreviations

BRFSS	Behavioral Risk Factor Surveillance Systems
CCI	Charlson comorbidity index
CDC	Centers for Disease Control and Prevention
DASI	Duke Activity Status Index
HAD	Hospital Anxiety and Depression
HALE	health-adjusted life expectancy
HRQOL	health-related quality of life
LPC	localized prostate cancer
METS	Metabolic Equivalents
MOS-SSS	Medical Outcomes Study Social Support Scale
NCCN	National Comprehensive Cancer Network
PSA	prostate-specific antigen
SRH	self-rated health
NHANES	National Health and Nutrition Examination Surveys

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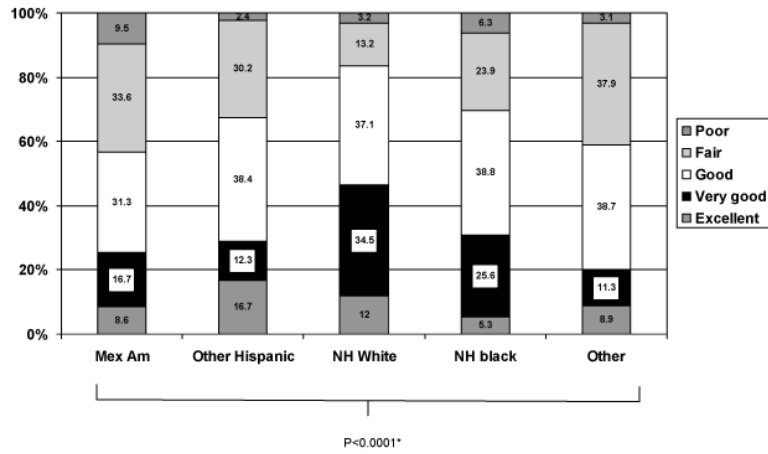


Figure 1.
 Distribution of self-rated health among men aged 50 years or more by race/ethnicity, NHANES 2005-08
 *P-value derived from design-based F-value.

Table 1

Estimation of life expectancy based on age and after adjustment for self-rated health

Age (Years)	Age-based life expectancy	Self-Related Health: "In the last one month, how would you rate your health?"				
		Excellent	Very Good	Good	Fair	Poor
70	13.4	18.9	16.1	13.4	11.7	9.5
71	12.8	18.2	15.4	12.8	11.7	9
72	12.2	17.5	14.8	12.2	10.5	8.5
73	11.6	16.8	14.1	11.6	10.5	8
74	10.0	16.1	13.5	11	10	8
75	10.5	14.8	12.9	10.5	9	8
76	9.9	14.1	12.2	9.9	8.5	8
77	9.4	13.5	11.7	9.4	8	8
78	8.9	12.9	11.1	8.9	8	8
79	8.4	12.2	10.5	8.4	8	8
80	7.9	11.7	10	8	8	8

Note: SRH=self-rated health; Patients older than 80 years have a life expectancy of less than 10 years irrespective of SRH. Patients younger than age 70 have a life expectancy of at least 10 years irrespective of SRH. Cells with SRH-adjusted HALE of less than 10 years are shaded. Guidelines recommend watchful waiting for patients with less than a 10-year life expectancy.

Table 2

Patient distribution by self-rated health status in the study sample (n=144)

Self-Rated Health	Categories	N (%)
N= 144	Excellent	39 (27.1)
	Very Good	68 (47.2)
	Good	30 (20.8)
	Fair	6 (4.2)
	Poor	1 (0.7)

Table 3

Differences between age-based life expectancy and health-adjusted life expectancy according to self-rated health by demographic characteristics of study sample (n=144)

	Age (AGE-LE)	Self-rated health(SRH-LE)	SRH-LE – AGE-LE
	Mean ± SD	Mean ± SD	Mean ± SD
All, n=144	19.7 ± 5.8	21.7 ± 6.6	1.9 ± 3.0*
Age, n=143			
<60 yrs (n=57)	25.6 ± 3.8	28.0 ± 4.5	2.3 ± 3.5*
60-70 yrs (n=71)	16.8 ± 1.9	18.5 ± 3.4	1.7 ± 2.8*
>70 yrs (n=15)	11.2 ± 1.6	12.7 ± 2.2	1.5 ± 1.7*
Race, n=143			
AA (n=18)	22.5 ± 6.8	23.6 ± 7.9	1.1 ± 2.9 ^{NS}
CA (n=125)	19.3 ± 5.6	21.4 ± 6.4	2.0 ± 3.0*
Education, n=140			
< H.S. (n=4)	19.2 ± 4.4	19.9 ± 4.9	0.8 ± 0.7 ^{NS}
H.S. (n=45)	20.8 ± 5.9	22.0 ± 6.9	1.1 ± 2.7*
>H.S. (n=91)	19.3 ± 5.7	21.9 ± 6.5	2.4 ± 3.2*
Income, n=141			
< \$50 000 (n=41)	18.7 ± 4.3	20.1 ± 5.9	1.3 ± 3.3*
> \$50 000 (n=100)	20.3 ± 6.3	22.5 ± 6.7	2.3 ± 2.9*

* Wilcoxon's signed rank test, P < 0.01; AA=African American, CA=Caucasian, H.S.=High school; LE = Life expectancy, NS=Not significant, SRH=Self-rated health.

Table 4

Differences between age-based life expectancy and health-adjusted life expectancy according to self-rated health by health characteristics of study sample (n=144)

	Age (AGE-LE)	Self-rated health (SRH-LE)	SRH-LE – AGE-LE
	Mean ± SD	Mean ± SD	Mean ± SD
All, n=144	19.7 ± 5.8	21.7 ± 6.6	1.9 ± 3.0 *
Gleason grade, n=143			
6 (n=78)	20.2 ± 5.7	22.4 ± 6.2	2.0 ± 3.2*
7 (n=49)	19.9 ± 5.6	22.3 ± 6.9	2.3 ± 2.9*
8+ (n=16)	16.7 ± 6.2	16.8 ± 5.9	0.1 ± 1.6 ^{NS}
PSA, n=144			
≤ 10 (n=127)	19.8 ± 5.7	21.9 ± 6.5	2.1 ± 3.1*
> 10 (n=17)	18.8 ± 6.8	19.7 ± 7.2	0.8 ± 1.9 ^{NS}
CCI, n=143			
0 (n=61)	20.1 ± 6.7	23.0 ± 7.4	2.9 ± 3.2*
1-2 (n=76)	19.6 ± 5.2	21.0 ± 5.9	1.4 ± 2.6*
3+ (n=6)	17.7 ± 2.9	16.4 ± 2.4	-1.9 ± 2.8 ^{NS}
DASI, n=143			
3-6 METS (n=11)	17.4 ± 5.7	17.6 ± 6.0	-0.03 ± 2.8 ^{NS}
6+ METS (n=132)	19.9 ± 5.8	22.1 ± 6.6	2.1 ± 2.9*
HAD-Anxiety score, n=143			
None (0-7)(n=111)	19.3 ± 5.9	21.2 ± 6.4	1.8 ± 2.8*
Mild (8-10)(n=21)	20.0 ± 4.8	23.0 ± 6.7	2.9 ± 3.7*
Moderate (11-14) (n=9)	24.7 ± 5.5	26.3 ± 7.0	1.3 ± 3.5 ^{NS}
Clinical 15-21 (n=2)	15.6 ± 2.4	15.9 ± 1.5	0.3 ± 0.9 ^{NS}
HAD-Depression score, n=140			
None (0-7) (n=137)	19.8 ± 5.8	21.8 ± 6.6	1.9 ± 3.0*
Mild (8-10) (n=3)	21.4 ± 10.0	22.0 ± 10.5	0.7 ± 0.9 ^{NS}
Moderate/Clinical (11-21) (n=0)	--	--	--
MOS-SSS, n=143			
< 50 th (n=6)	18.0 ± 5.8	20.4 ± 7.6	2.4 ± 2.8 ^{NS}
50 th -75 th (n=23)	21.6 ± 5.8	22.8 ± 6.7	1.0 ± 3.4 ^{NS}
75 th -100 th (n=114)	19.4 ± 5.8	21.6 ± 6.6	2.0 ± 2.9*

* Wilcoxon's signed rank test, P < 0.01; CCI=Charlson comorbidity index, DASI = Duke Activity Status Index, HAD = Hospital Anxiety and Depression, PSA = Prostate-specific antigen; LE=Life expectancy, MOS-SSS = Medical Outcomes Study – Social Support Scale, NS=Not significant, SRH=Self-rated health.

Table 5
Correlation matrix for age, self-rated health and health characteristics of the study sample (n=140)

	Age	SRH	Gleason	PSA	CCI	DASI	Anxiety	Depression	MOS-SSS
Age		0.01	0.14	0.09	0.05	-0.42*	-0.33*	-0.08	0.09
SRH			0.07	0.26*	0.28*	-0.21*	0.14	0.28*	-0.07
Gleason				0.23*	-0.03	-0.06	0.06	0.14	0.12
PSA					-0.08	-0.23*	-0.09	0.03	-0.04
CCI						-0.08	0.06	-0.04	-0.003
DASI							0.22*	-0.05	-0.07
Anxiety								0.48*	-0.14
Depression									-0.09
MOS-SSS									

* Spearman rank correlation, $P < 0.01$; CCI=Charlson comorbidity index, DASI = Duke Activity Status Index, PSA = Prostate-specific antigen, MOS-SSS = Medical Outcomes Study – Social Support Scale, SRH=Self-rated health.