



Original article

Determinants of quality of life in prostate cancer patients: A single institute analysis



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ABSTRACT

Objective: To determine factors that influence quality of life in prostate cancer patients.

Patients and methods: Patients with pathologically verified prostate cancer and treated at the National Cheng Kung University Hospital were invited to fill out the World Health Organization Quality of Life-BREF questionnaires at the outpatient clinic. We explored the determinants of quality of life including age, education, income, marital status, disease stage, and treatment modality using a mixed-effects model.

Results: From January 2013 to July 2014, a total of 248 patients were investigated and 404 measurements were performed. Among them, there were 110 patients, 48 patients, and 90 patients with localized, locally advanced, and metastatic disease, respectively. After adjustment for comorbidities and other confounders, patients who were married showed a significantly higher score in the domains of physical health, social relationships including sexual satisfaction, and opportunities to obtain information and leisure activities. A higher income was associated with a higher score in physical, psychological, and environment domains. Patients with metastatic disease showed lower scores in the physical domain.

Conclusion: Our data demonstrated that marital status is an important determinant of quality of life in prostate cancer patients besides other sociodemographic factors. Clinicians are advised to provide more social support recourses for patients who do not have a partner.

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1. Introduction

Prostate cancer is a major malignancy of men in the United States and other developed countries.¹ It has also become a major male malignancy in Asia, including Taiwan.^{2,3} There are several characteristics in Asian patients that differ from western countries, such as stage distribution, attitude to therapy modality, and response to androgen deprivation therapy.^{4–6} Unlike other human malignancies, the life span of prostate cancer patients is longer, particularly those patients detected from prostate-specific antigen (PSA) screening.⁷ Quality of life (QOL) improvement has become another important goal in prostate cancer treatment. Many studies have

focused on QOL in specific issues, including sexual dysfunction,^{8–10} urinary incontinence,^{9,10} and bowel changes^{9,10} which are therapy-related, or on discussing anxiety raised by PSA screening.¹¹ However, studies involving general aspects are not abundant.

To investigate the determinants that influence general QOL in prostate cancer patients, we conducted this study by collecting and analyzing patients' self reported questionnaires of the World Health Organization Quality of Life-BREF (WHOQOL-BREF) Taiwan version at an outpatient clinic, which can improve the understanding of disease-impacted general QOL for both urologists and patients and provide some insightful information for decision-making in the clinical care of prostate cancer patients.

2. Patients and methods

2.1. Patient population

The current study was approved by the Institutional Review Board of the National Cheng Kung University Hospital, Tainan,

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Taiwan, after commencement. For a global view of real-world data, we invited every patient with prostate cancer who came to the urologic clinic of the National Cheng Kung University Hospital to join the study from January 2013 to July 2014. The studied patients included those immediately before transrectal ultrasound-guided prostate biopsy, undergoing androgen deprivation therapy for metastatic prostatic cancer, and patients after definite therapy such as radical prostatectomy, radiation therapy, or under active surveillance/observation. Patients who were immediately before transrectal ultrasound-biopsy that later turned out to be malignancy were included for their innate difference between patients with benign disease. They also served as a baseline for analysis on the impacts of QOL among different treatment strategies. After obtaining each patient's consent, they were requested to fill out the questionnaires of WHOQOL-BREF. Repeated measurements in the same individual at different times were conducted to reflect the dynamic changes of QOL under different conditions.

2.2. WHOQOL-BREF questionnaires

The brief version of the WHOQOL-BREF is a generic questionnaire composed of two items from the Overall Quality of Life and General Health facet and one item from each of the remaining 24 facets.¹² These facets are classified into four major domains: physical capacity (7 items), psychological well-being (6 items), social relationships (3 items), and environment (8 items). In compliance with the WHO guidelines, the Taiwanese version of the WHOQOL-BREF was developed.¹³ In 2000, the excellent reliability and validity of this version was published.¹⁴ In addition to comprising 26 items translated from the original WHOQOL-BREF, the Taiwanese version also contains two additional items of local importance, i.e., being respected and food availability.¹⁴ The two local items are categorized in the social relationships (being respected) and environment (food availability) domains, respectively. The WHOQOL-BREF Taiwan version was used in this study for evaluation of general QOL. Each item is scored as a 5-level Likert scale ranging from 1 to 5, and a higher score generally represents a better QOL. Three items are reversely coded (items 3, 4, and 26). Domain scores were calculated as the mean of items in each domain and multiplied by four with a total sum ranging from 4 to 20, which were converted into a 0–100-range in the statistical analysis.

2.3. Statistical analyses

In addition to the collection of QOL responses, we also abstracted demographic and clinical data including age, education, economic income, marital status, comorbidity of cardiovascular disease, patients' categorization (divided into localized, locally advanced, and distant metastasis), and treatment modalities (i.e., active surveillance, after radical prostatectomy, after radiotherapy, or under long-term androgen deprivation therapy). Because of the small sample size, patients with more than one positive lymph node without evidence of distant metastasis were classified into the locally advanced disease state.

The chi-square test was applied for the difference of determinant distribution among different groups and $p < 0.05$ was considered as statistically significant. For each independent variable, we selected one as the reference in the category for comparison: age at interview (<65 years, 65–74 years, vs. ≥ 75 years), education (>6 years vs. ≤ 6 years), marital status (conjugal vs. nonconjugal), income (\leq US\$1667/mo vs. >US\$1667/mo), and cardiovascular comorbidities (yes vs. no). By assuming a linear autocorrelation for repeated measurements within individual patients and using the scores for each domain and individual item as the

dependent variables, mixed-effects models were constructed. The result was viewed as statistically significant for $p < 0.05$. All data were collected and analyzed using version 9.2 of SAS software (SAS Institute, Cary, NC, USA).

3. Results

A total of 248 cases were enrolled during the 19-month period with 404 measurements performed. Table 1 summarizes frequency distribution among the participants stratified by different stages. Our sample contains a slightly higher proportion of patients with distant metastasis, however, the distribution appears similar to the national prostate cancer population (Table 2). Generally, the major characteristics of patients' measurements were patients aged > 65 years, with localized or metastatic disease, married with relatively low income, or without cardiovascular disease (Table 1).

3.1. Mixed-effects model analysis for QOL of prostate cancer

The results of the mixed-effects model were summarized for the scores of domains (Table 3) and items (Table 4), respectively. We found that patients of a younger age (<65 years) had a higher score in the physical domain than older patients (≥ 75 years), of which they had a higher score on mobility and were less dependent on medical aids. Patients with a monthly income <US\$1667 showed lower scores in the physical, psychological, and environment domains. A detailed analysis for different items showed significantly lower scores in mobility, dependence on medical aids, and working capacity of the physical domain; lower scores in positive feelings, self-esteem, and spirituality/beliefs of the psychological domain; as well as the same trend of financial resources, participation in and opportunities for recreation/leisure activities of the environment domain. Patients who were married or conjugal at the time of interview expressed higher scores on the physical (mainly mobility item) and social domain (mainly item of sexual activity). Patients with distant metastasis had lower scores in the physical domain, especially the items of pain and discomfort, energy and fatigue, mobility, sleep, and rest compared with patients in the localized cancer group. In terms of treatment modality, patients receiving radical prostatectomy had significantly lower scores in the item of sexual activity and being respected of the social domain, however, they had less pain/discomfort and a higher overall score of QOL.

4. Discussion

In this study, we tried to control potential confounding factors through construction of a mixed-effects model. The effects of both general factors (age, education, personal income, marital status, comorbidity of cardiovascular disease) and disease specific factors (cancer group, treatment group) on QOL in patients with prostate cancer were analyzed.

We demonstrated that both general and disease specific factors had an influence on QOL of prostate cancer patients, including age, personal income, marital status, disease status, and treatment modality, respectively, which corroborate previous studies.^{15,16} The effects of education on the four major domains of QOL were not significant in this study, apparently because of the small sample size that precludes us from classifying into more strata. As expected, younger patients or less disease-advanced patients had better energy coping with daily life activities. Personal income also had strong positive influences on the scores of the physical, psychological, and environment domains. As Table 2 shows, the demographic and clinical stage distributions of our participants were similar to the national prostate cancer population of Taiwan,¹⁷ hence the generalizability of our findings for QOL seem

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