RESEARCH ARTICLE

# General Health Related Quality of Life and Associated Factors among Prostate Cancer Patients in Two Tertiary Medical Centers in Kuala Lumpur, Malaysia: A Cross-sectional Study

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## Abstract

**Measurement of quality of life among prostate cancer patients helps the health care providers to understand the impact of the disease in the patients' own perspective. The main aim of this study is to measure the quality of life among prostate cancer patients at University Malaya Medical Center (UMMC) and Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and to ascertain the association factors for physical coefficient summary (PCS) and mental coefficient summary (MCS). A hospital based, cross sectional study using the Short Form-36 (SF-36) questionnaire was conducted over a period of 6 months. A total of 193 respondents were recruited. Their total quality of life score was 70.1±14.7 and the PCS score was lower compared to MCS. The factors associated for PCS were: age, living partner, renal problem, urinary problem of intermittency, dysuria and hematuria. Factors associated for MCS were: age, living partner, renal problem, presenting prostatic specific antigen and urinary problem of intermittency and dysuria. Our prostate cancer patients had moderate quality of life in the physical health components but their mental health was less affected.**

**Keywords:** Health related quality of life - associated factors - prostate cancer - Kuala Lumpur - Malaysia

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## Introduction

Prostate cancer is the second most common cancer in men with an incidence of 25.3 per 100,000 worldwide and the second leading cause of cancer death in men (Vera, 2007; Jan-Erik and Aus, 2008; American Cancer Society, 2010). In Malaysia, the age standardized incidence of prostate cancer in 2007 was 6.4 per 100,000 populations and ranked 4th of the common cancers in males after lung, colorectal and nasopharynx carcinomas. By ethnicity, Chinese has the highest age standardized incidence followed by Indian and Malay (8.7, 5.8 and 4.9 per 100,000 populations respectively) (Zainal-Arifin and Nor-Saleha, 2011). A prostate cancer case in Malaysia is expected to move up in position with an increasingly ageing population in Malaysia (Gerard, 2003).

Quality of Life is a multidimensional construct and difficult to define and health-related quality of life (HRQOL) encompasses a wide range of human experience including the daily necessities of life such as food and shelter, interpersonal and intrapersonal responses to illness and the activities associated with professional fulfillment and personal happiness (Calman, 1984; David et al., 2003; Marcus and David, 2005). It also includes the overall sense of satisfaction that an individual experiences with life and most importantly patients' perception of personal health and ability to function (Patrick and Erickson, 1990).

Measuring HRQOL provides information helpful for men with prostate cancer in a variety of clinical circumstances and to investigators comparing treatments (James and Jack, 1998). Men who live with prostate cancer have many concerns on how the disease and its treatment will affect their lives. Most men who are diagnosed with prostate cancer are able to continue and enjoy intimate, sexual relationship with full sexual function as well as to continue enjoying other activities (Glen and Deborah, 2005). Measurement of quality of life among prostate cancer patients helps the health care providers to understand the impact of the disease in the patients' own perspective and make health services more patient-centered (David et al., 2003). This will provide information on whether or not the consequences of the disease and the complications of the treatment are tolerable or not (Cella et al., 1993).

To date, many studies assessed the relationship between prostate cancer and HRQOL focused on the general and disease-specific QOL domains (Harry, 1997; David et al., 2003). There are also many studies focused on the impact of prostate cancer and its treatment on HRQOL based on metastases status of prostate cancer (David et al.,

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2003). Men with prostate cancer and the clinicians who treat them should be aware of the effects of treatment on quality of life, and weigh them up against the patient's age and the risk of progression of prostate cancer if untreated to make informed decisions about treatment (David et al., 2009).

Our study specifically aims to look at the HRQOL among prostate cancer patients in surgical clinic setting. We also documented the socio-demographic, medical and surgical illness, current urinary problems and cancer status of these patients and ascertained their association with HRQOL.

## Materials and Methods

*Study design*

This is a hospital based, cross-sectional study involving prostate cancer patients attending surgical clinics at University Malaya Medical Centre (UMMC) and Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Kuala Lumpur. UMMC is teaching hospital for University of Malaya while UKMMC is the teaching hospital for National University of Malaysia and both of these teaching hospitals are under the Ministry of Higher Education, Malaysia (Ministry of Higher Education Malaysia, 2011).

*Selection of patients*

All patients aged 50 years old and above visiting surgical clinic who have been diagnosed with prostate cancer were invited to participate in our study. Universal sampling was conducted on all eligible patients who attended the clinics from 1st. August 2010 to 30th January 2011. Patients who were illiterate in Malay or English languanges were excluded.

*Method of data collection*

There were two methods of data collection: (i) face to face interview using administered questionnaire to collect primary data on the socio-demographic characteristics, past medical and surgical history; and signs and symptoms of urination and (ii) review of medical records to obtain information on the past medical and surgical histories, drug histories and cancer status of the patients.

*Assessment of quality of life (QOL)*

The general quality of life (QOL) was assessed using Short Form Health Survey with 36-item (SF-36). SF-36 is a practical and valid instrument for use on older people (Stephen et al., 2001). The SF-36 comprises 36 items covering eight domains targeting Physical Measures Summary (PCS) and Mental Measures Coefficient (MCS) (Ware and Sherbourne, 1992). The eight domains are: (i) physical function (PF); (ii) role physical (RP); (iii) bodily pain (BP); (iv) mental health (MH); (v) role-emotional (RE); (vi) vitality energy (VT); (vii) general health perception (GH) and (viii) social functioning (SF). Physical function, role physical and bodily pains are strongly correlated with PCS which includes question about physical health and possible limitations for physical health problem. Mental health, role emotional and social

**Table 1. Patient's Socio-demographics, Medical and Surgical Characteristics and Current Prostate Cancer Status**

| Patients' characteristics | | Number of patients (N=193), n(%) |
|---|---|---|
| a) Patients' socio-demographics, Medical & Surgical characteristics | | |
| Age | >60 | 10 (5.2) |
| | 60-69.9 | 54 (28.0) |
| | 70-79.9 | 99 (51.3) |
| | <80 | 30 (15.5) |
| Race | Malay | 60 (31.1) |
| | Chinese | 101 (52.3) |
| | Indian | 28 (14.5) |
| | Sikh | 4 (2.1) |
| Marital status | Married | 172 (89.1) |
| | Not Married | 5 (2.6) |
| | Widow | 16 (8.3) |
| Number of children | <5 | 120 (62.2) |
| | >5 | 73 (37.8) |
| Living condition | Alone | 11 (5.7) |
| | With Partner/Family | 182 (94.3) |
| Educational level | Tertiary | 73 (37.8) |
| | Secondary | 109 (56.5) |
| | Primary | 11 (5.7) |
| Smoking status | Never smoke | 83 (43.0) |
| | Ever smoke | 110 (57.0) |
| Consuming alcohol | Never drinker | 139 (72.0) |
| | Ever drinker | 54 (28.0) |
| b) Patients' Medical & Surgical characteristics | | |
| Comorbidities | Yes | 168 (87.0) |
| | No | 25 (13.0) |
| History of surgery | Yes | 119 (63.0) |
| | No | 74 (37.0) |
| Medical Conditions | Hypertension | 114 (67.9) |
| | Hyperlipidemia | 65 (38.7) |
| | Diabetes mellitus | 56 (33.3) |
| | Heart disease | 58 (34.5) |
| | Gout / Joint problem | 28 (16.7) |
| | Asthma | 12 (7.1) |
| Family history of Prostate cancer | | |
| | Yes | 51 (26.4) |
| | No | 142 (73.6) |
| c) Current prostate cancer status | | |
| Life in Cancer | <5 years | 142 (73.5) |
| | >5 years | 51 (26.4) |
| Presenting PSA | <100 ng/ml | 135 (73.8) |
| | >100 ng/ml | 48 (26.2) |
| Type of cancer | Adenocarcinoma | 109 (100.0) |
| Gleason score | <7 | 85 (44.0) |
| | 7 | 55 (28.5) |
| | >7 | 53 (27.5) |
| Latest PSA | <4 ng/ml | 114 (59.1) |
| | >4 ng/ml | 79 (40.9) |
| Metastases | Yes | 113 (58.5) |
| | No | 80 (41.5) |
| Treatment | Active Surveillance | 19 (9.8) |
| | Orchidectomy | 29 (15.0) |
| | Radical prostatectomy | 21 (10.9) |
| | Radiotherapy | 60 (31.1) |
| | Tablet Casodex | 51 (26.4) |
| | Injection Lucrine | 52 (26.9) |
| | Injection Zoladex | 86 (44.6) |

**Table 2. Quality of Life of the Patients According to Domains**

| | PF | RP | BP | GH | VT | SF | RE | MH | PCS | MCS | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 70.3 | 57.6 | 67.3 | 73.9 | 69.1 | 72.0 | 75.6 | 82.5 | 67.1 | 73.7 | 70.1 |
| Std dev | 21.8 | 39.4 | 14.7 | 13.9 | 12.9 | 16.6 | 36.2 | 12.8 | 15.5 | 13.0 | 14.7 |
| 25th percentile | 60.0 | 25.0 | 62.0 | 66.0 | 60.0 | 62.5 | 66.7 | 72.0 | 55.6 | 67.2 | 62.0 |
| 50th percentile | 75.0 | 50.0 | 64.0 | 77.0 | 70.0 | 75.0 | 100.0 | 84.0 | 68.8 | 76.1 | 72.3 |
| 75th percentile | 85.0 | 100.0 | 74.0 | 82.0 | 80.0 | 87.5 | 100.0 | 92.0 | 78.6 | 82.1 | 81.3 |

*RF=Physical Functioning, RP=Role limitations due to physical health, BP=Bodily pain, GH=General health perception, VT=Vitality, SF=Social Functioning, RE=Role limitation due to emotional problem, MH=General Mental Health

functions are strongly correlated with MCS. Vitality and social function correlate significantly with both summaries which include the questions about feelings and possible limitations from emotional problems.

Each of the eight scales scores from 0-100 with higher scores indicating higher function. The SF-36 has been shown to be reliable and valid. The UK version of SF-36 had been translated to Malay version by a group of researchers from University of Science, Malaysia (USM) under the International Quality of Life Assessment (IQOLA) Project (Monika et al., 1998).

*Statistical analysis*

The data was entered and analyzed using Statistical Package for Social Science (SPSS) version 16.0 (SPSS Inc, Chicago, IL). The scoring for the quality of life was performed using Microsoft Excel, Quality Metric SF-HRQOL scoring software (Quality Metric Incorporated, Lincoln, RI). The significant level was preset at $\alpha$=0.05. The normality of continuous data was checked via Kolmogorov-Smirnov testing. The normally distributed continuous data was presented in the form of mean values with the corresponding standard deviations. Median values and their corresponding 25$^{th}$ and 75$^{th}$ inter-quartile range values were presented for the non-normally distributed continuous data. The categorical data were presented in the form of absolute number and their corresponding percentages values.

Simple linear regression (SLR) was used to determine the association between the categorical independent variable and the HRQOL score. All the significant independent variable in the bivariate analyses and the independent variables with p<0.20 (George and Sander, 1993) and the variables that are biologically plausible were further analyzed by using forward methods of multiple linear regressions. The final model included all predictors that remained statistically significant (p<0.05) after multivariate adjustment through the stepwise method. Checking for interaction, multicollinearity, model assumption and outliers were done before the development of the final model.

## Results

A total of 193 patients with prostate cancer were recruited. The highest score for The highest score for HRQOL was 98.1 and the lowest score was 30.0. The cronbach's $\alpha$ indicating internal consistency for SF-36 was 0.718.

Table 1 shows the patients' socio-demographic characteristics, past medical and surgical histories and current prostate cancer status of the patients. More than 50% of the patients were Chinese and almost 95% were aged more than 60 years old. Majority of the patients were married (89.1%) and staying with family or their partners (94.3%). There were 87.0% of them had at least one co-morbidity with the commonest being hypertension (67.9%). There was 26.4% with family history of prostate cancer and 63.0% with history of any surgery. Majority of the patient's had cancer less than 5 years and all patients had adenocarcinoma. Their mean Gleason score was 6.6±1.6 at the time of diagnosis.

The SF-36 quality of life dimension scores are shown in Table 2. A wide range of scores were reported for all dimension. The interpretation of the scores was based on the transformed scale of 0-100. In general, the higher the score, the better quality of life. The highest mean score was mental health (MH) while the lowest mean score was the role physical (RP) domain. Although the overall mean scores were above 50.0 in all domains, domains related to the physical health status showed relatively lower score compared to mental component. PCS and MCS were strongly correlated (rs=0.794, p<0.001).

Self-reported health transition was not used in the scoring but was used to estimate the change in health status from a year before the study period. Almost 71% of the patients reported their health status as the same as the year before. No respondents reported that their health was much worse than a year before.

Table 3 shows the simple linear regression and Table

**Table 3. The Simple Linear Regression (SLR) and for the Factors that Associated with Physical Coefficient Summary (PCS)**

| Variables | b[a] (95%CI) | p-value |
|---|---|---|
| Age (60-69.99 vs less than 60) | -11.30 (-24.7, 2.02) | 0.149 |
| Age (70-79.99 vs less than 60) | -16.50 (-29.4, -3.66) | 0.005* |
| Age (>80 vs <60) | -25.10 (-39.3, -10.9) | 0.031* |
| No. of children (<5 vs >5) | 5.17 (0.67, 9.67) | 0.025* |
| Living partner (Alone vs Family/Partner) | -12.50 (-21.8, -3.09) | 0.009* |
| Educ level (Secondary vs Primary) | -8.44 (-20.0, 3.15) | 0.241 |
| Educ level (Tertiary vs Primary) | -14.10 (-25.9, -2.24) | 0.014* |
| Smoking status (Non vs Ever smoke) | 6.51 (2.14, 10.9) | 0.004* |
| Renal problem (Yes vs No) | -8.65 (-17.1, -0.20) | 0.045* |
| History of Surgery (Yes vs No) | -6.48 (-11.0, -1.98) | 0.005* |
| Frequency (Yes vs No) | -9.30 (-13.7, -4.93) | <0.001* |
| Urgency (Yes vs No) | -8.78 (-14.1, -3.42) | 0.001* |
| Nocturia (Yes vs No) | -10.10 (-16.6, -3.71) | 0.002* |
| Satisfaction of micturition (Yes vs No) | 8.21 (3.9, 12.6) | <0.001* |
| Intermittency (Yes vs No) | -11.60 (-15.8, -7.50) | <0.001* |
| Dysuria (Yes vs No) | -14.00 (-20.4, -7.60) | <0.001* |
| Hematuria (Yes vs No) | -15.20 (-22.1, -8.23) | <0.001* |
| Incomplete emptying (Yes vs No) | -11.30 (-15.6, -7.05) | <0.001* |
| Orchidectomy (Yes vs No) | -6.86 (-13.0, -0.75) | 0.028* |

*Denotes statistically significant at $\alpha$=0.05, [a]Crude regression coefficient

**Table 4. Multiple Linear Regression (MLR) for the Factors that Associated with Physical Coefficient Summary (PCS)**

| Variables | b[a] (95% CI) | p-value |
|---|---|---|
| Age (60-69.99 vs <60) | -10.30 (-20.0, -0.63) | 0.037* |
| Age (70-79.99 vs <60) | -13.40 (-22.9, -4.00) | 0.006* |
| Age (>80 vs <60) | -20.90 (-31.2, -10.7) | <0.001* |
| Living partner (Alone vs Family/Partner) | -17.40 (-26.1, -8.68) | <0.001* |
| Renal problem (Yes vs No) | -5.12 (-9.38, -0.85) | 0.019* |
| Intermittency (Yes vs No) | -9.19 (-13.2, -5.15) | <0.001* |
| Dysuria (Yes vs No) | -7.79 (-13.7, -1.83) | 0.011* |
| Hematuria (Yes vs No) | -9.18 (-15.6, -2.78) | 0.005* |

*Denotes statistically significant at α=0.05, [a]Adjusted regression coefficient; Multiple linear regression ($R^2$=0.622). The model reasonably fits well. Model assumptions are met. There is no interaction between independent variables and muticollinearity problem)

**Table 5. The Simple Linear Regression (SLR) and for the Factors that Associated with Mental Coefficient Summary (MCS)**

| Variables | b[a] (95% CI) | p-value |
|---|---|---|
| Age (60-69.99 vs <60) | -7.79 (-19.4, 3.80) | 0.448 |
| Age (70-79.99 vs <60) | -11.00 (-22.2, 0.18) | 0.056 |
| Age (>80 vs <60) | -15.70 (-28.0, -3.38) | 0.005* |
| Living partner (alone vs family/partner) | -12.80 (-20.6, -5.06) | 0.001* |
| Educ level (secondary vs primary) | -3.61 (-13.3, -6.10) | <0.001* |
| Educ level (tertiary vs primary) | -9.34 (-19.3, 0.58) | 0.072 |
| Renal problem (Yes vs No) | -8.91 (-15.8, -1.97) | 0.012* |
| History of Surgery (Yes vs No) | -4.80 (-8.59, -1.01) | 0.013* |
| Frequency (Yes vs No) | -9.30 (-13.7, -4.93) | <0.001* |
| Urgency (Yes vs No) | -7.08 (-11.6, -2.58) | 0.002* |
| Nocturia (Yes vs No) | -6.42 (-11.9, -0.98) | 0.021* |
| Satisfaction of micturition (Yes vs No) | 6.95 (3.31, 10.6) | <0.001* |
| Intermittency (Yes vs No) | -7.13 (-10.71, -3.54) | <0.001* |
| Dysuria (Yes vs No) | -10.20 (-15.6, -4.76) | <0.001* |
| Hematuria (Yes vs No) | -10.80 (-16.7, -4.89) | <0.001* |
| Incomplete emptying (Yes vs No) | -7.60 (-11.3, -3.93) | <0.001* |
| Presenting PSA (> vs < 100 ng/ml) | -6.67 (-10.9, -2.42) | 0.002* |
| Latest PSA (> vs < 4 ng/ml) | -3.85 (-7.57, -0.12) | 0.043* |
| Orchidectomy (Yes vs No) | -6.79 (-11.9, -1.70) | 0.009* |

*Denotes statistically significant at α=0.05, [a]Crude regression coefficient

**Table 6. Multiple Linear Regression (MLR) for the Factors that Associated with Mental Coefficient Summary (MCS)**

| Variables | b[a] (95% CI) | p-value |
|---|---|---|
| Age (>80 vs <60) | -5.45 (-22.4, -10.4) | <0.001* |
| Living partner (alone vs family/partner) | -15.55 (-24.9, -6.23) | 0.001* |
| Renal problem (Yes vs No) | -2.05 (-11.1, -1.77) | 0.045* |
| Intermittency (Yes vs No) | -3.01 (-11.3, -2.26) | 0.004* |
| Dysuria (Yes vs No) | -2.90 (-13.2, -2.41) | 0.005* |
| Presenting PSA (> vs < 100 ng/ml) | -2.76 (-11.1, -1.77) | 0.008* |

*Denotes statistically significant at α=0.05, [a]Adjusted regression coefficient; Multiple linear regression ($R^2$=0.604). The model reasonably fits well. Model assumptions are met. There is no interaction between independent variables and muticollinearity problem)

4 shows the multiple linear regression for the physical coefficient summary (PCS). There were six significant factors associated with PCS which were: age of the patients (p<0.001), living partner (p<0.001), renal problem (p=0.019), urinary problem of intermittency (p<0.001), dysuria (p=0.011) and hematuria (p=0.005). These six factors explained 62.2% of the variance for PCS.

Table 5 shows the simple linear regression and Table 6 shows the multiple linear regression for the mental coefficient summary (MCS). There were also six significant factors associated with MCS which were: age of the patients (p=0.005), living partner (p=0.001), renal problem (p=0.045), presenting PSA (p=0.008), urinary problem of intermittency (p=0.004) and dysuria (p=0.005). These six factors explained 60.4% of the variance for MCS.

## Discussion

The mean age of our respondents was 72.5±7.1 years. Prostate cancer is rare before the age of 40, but the chance rises rapidly after age 50 (Gabriel and Wael, 1997; Ravi et al., 2004; Vinay et al., 2005; Cancer Research UK, 2010). More than 80% of prostate cancer is diagnosed in men who are 65 years or older (Gabriel and Wael, 1997; Vinay et al., 2005; American Cancer Society, 2010). About half of our respondents were Chinese (52.3%) which correlated with the highest age standardized incidence of prostate cancer among Chinese in Malaysia in year 2007 (Zainal-Ariffin and Nor-Saleha, 2011).

There was an increase in the prostate cancer incidence among those with family history of prostate cancer (Bratt, 2002; Ravi et al., 2004; Hsing & Chokkalingam, 2006; Razvan et al., 2007; American Cancer Society, 2010; Anne, 2010). In our study, about one third of our participants had family history of prostate cancer. A case control studied in Malaysia showed that there was 3.8 times risk of having prostate cancer for those who had first degree relative with history of prostate cancer (Mohd-Nizam et al., 2009).

The mean score of the general QOL among our participants was higher than the study done by Nasser (2010) which their score was only 52.4. Our highest mean score was the mental health (MH) domain (82.5). However, study done by Nasser (2010) found bodily pain (BP) score was the highest (65.0). While studies done by Mark et al. (1998) and Peter et al. (1997) found social functioning were the highest (80.0 and 80.4, respectively). Our lowest means score was the role physical (RP) domain (57.6) which was similar with the studies done by Jayadevappa et al. (2006), Mark et al. (1998) and Peter et al. (1997).

The physical health status (PCS) score in this study was 67.1 and the mental health status (MCS) score was 73.7. The PCS score was relatively lower compared to MCS. This result is consistent with other studies (Cleary et al., 1995; Mark et al., 1998; David et al., 2003; Shunichi and Yoichi, 2010). A relatively higher score in the MCS in our study showed that mental health was less affected by prostate cancer. This could be due to our participants had better coping mechanism and adaptation to this chronic disease. The similarities and differences observed when compared to other studies can be attributed to factors including utilization of the study instrument, selection, definition and size of sample and the inherent cultural differences that exist between countries (Jayadevappa et al., 2006).

Age was negatively correlated with HRQOL among

prostate cancer patients (David et al., 1998; David et al., 2001; Richard et al., 2004; Markus et al., 2010) and among survivors of prostate cancer. It was also found that there was a slow decline in QOL with time (Schag et al., 1994) which our results also showed PCS and MCS were negatively correlated with age. Urinary continence and sexual function were age-related and independently associated with co-morbidity (Micheal et al., 2009). Since HRQOL declined with time, greater efforts should be made to understand the rehabilitation problems of this advanced disease so that the problems can be anticipated (Peter et al., 1997).

Some studies found that certain urinary problems (such as intermittency, dysuria and hematuria) were associated with HRQOL similar with our findings (Gunnar et al., 2002; David et al., 2003; 2005) and marital status was not associated with HRQOL (p=0.138) but those who stayed with family members or partners were found to have better HRQOL in our study (p<0.05).Contradicting results were observe in other study where marital status was associated with better HRQOL (David et al., 1998).

There were few limitations in our study. Since this is a cross-sectional study, we were unable to establish the temporal sequence between the associated factors and the quality of life. Universal sampling which was conducted in this study had a tendency to non-sampling errors like selection bias, response bias and non-response bias.

Some of our Chinese and Indian patients may have language problem since they could not understand both Malay (the national language of the country) and English languanges. A validated translation in both Chinese and Tamil should be developed in the future to overcome this problem. Almost all the patients were elderly and therefore some information might have been bias due to poor recall. Retrieval of data from the patients' folder was also problematic as some of the folders were not well organized.

There were few strengths in our study. SF-36 is self-administered (WHOQOL Group, 1998), however our cronbach's $\alpha$ for SF-36 was 0.718 which showed that it has good psychometric properties in our population. The multivariate analysis adjustment through the stepwise method was done to adjust for the confounding factors. Checking the interaction, multicollinearity and model assumption and outlier were done before the final model developed to find the associated factors that influenced the physical and mental coefficient summaries.

In conclusion, this study showed our prostate cancer patients had moderate quality of life in the physical health components but their mental health was less affected. Treating the prostate cancer, their medical illness and encourage them to stay with family members can improve their quality of life. It is recommended that medical personnel should try to improve the physical health of patients with prostate cancer.

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