

Factors Affecting Quality of Life at Different Intervals After Treatment of Localized Prostate Cancer: Unique Influence of Treatment Decision Making Satisfaction, Personality and Sexual Functioning



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Abbreviation and Acronym

QOL = quality of life

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Purpose: Using patient reported outcomes measures we identified the most informative set of factors associated with quality of life in a large sample of men treated for localized prostate cancer.

Materials and Methods: We examined relationships with quality of life using FACIT (Functional Assessment of Chronic Illness Therapy). We also hypothesized variables in a sample of men diagnosed with localized prostate cancer who represented different time points since treatment, including less than 12 months in 70, 1 to 3 years in 344, greater than 3 to 5 years in 291 and greater than 5 years in 97. Correlative measures included subscales of MAX-PC (Memorial Anxiety Scale for Prostate Cancer), short forms of PROMIS® and SOMS (Surgical Outcomes Measurement System), TDM-SATS (Treatment Decision-Making Satisfaction Scale) and subscales of the BFI (Big Five Inventory) of personality.

Results: Quality of life was significantly associated with hypothesized variables across different time cohorts. In regression models several factors accounted for most of the variability in quality of life scores depending on time since treatment, including 47%, 22%, 29% and 27% at less than 12 months, 1 to 3 years, greater than 3 to 5 years and greater than 5 years, respectively. Upon examining the unique contribution of these variables, treatment decision making satisfaction was the only variable to have a significant and unique contribution to quality of life across all 4 time cohorts (standardized coefficients 0.33, 0.27, 0.31 and 0.49, respectively, $p < 0.01$). In the cohort with 1 to 3 years since treatment erectile function and neurotic personality style also had unique associations with quality of life (standardized coefficients 0.25 and -0.20 , respectively).

Conclusions: When considering the short-term and the longer term quality of life of a man after treatment for localized prostate cancer, our findings highlight the importance of treatment decision making satisfaction, erectile function and personality.

Key Words: prostatic neoplasms, quality of life, decision making, neuroticism, surveys and questionnaires

PROSTATE cancer is the second most common form of cancer in American men and the second leading cause of cancer related death.¹ In the last 2 decades research on early detection and improved treatment mechanisms has highlighted a 5-year survival rate in men with localized prostate cancer of up to almost 100% followed by a 98% 10-year survival rate.^{1,2} With such a high probability for long-term survival QOL after diagnosis and treatment is a primary concern for men and their care providers.

Men newly diagnosed with localized disease are faced with multiple treatment options, including surgery, radiation and hormonal treatment, each bringing its own set of side effects.³ Individuals with very low risk disease also have the option to forego immediate definitive treatment and instead undergo active surveillance. This brings a new host of stressors for many men and their partners, including fear of progression.⁴

A variety of psychological, physical and functional factors contribute to overall QOL in men with prostate cancer. This includes the emotional response to diagnosis and treatment in the form of state and trait anxiety,⁵ impaired urological functioning as a result of disease or treatment related side effects⁶ and overall satisfaction with treatment decision making.⁷ Although some men with prostate cancer return to pretreatment levels of QOL after completing treatment, many report elevated anxiety and depression levels long after treatment has ended.⁵

Prostate cancer treatment side effects are also directly related to individual QOL. Erectile dysfunction is the most frequently reported long-term side effect associated with prostate cancer treatment and sexual dysfunction ranks as the number 1 concern identified by prostate cancer survivors.⁸ Men report that the effects of erectile dysfunction go beyond failure to perform sexual intercourse, and claim that it decreases their sense of masculinity and negatively affects their ability to feel emotionally and physically close to their partner.⁶

Urinary incontinence is another common side effect, which can be caused by the enlarged prostate as well as nerve and muscle damage after treatment. Rates of bowel dysfunction, diarrhea and rectal bleeding are relatively lower, primarily resulting from external beam radiotherapy, which targets a wide area with radiation.⁹ In some men physical side effects resolve within 6 months to 2 years after treatment but others may never completely recover, thus highlighting the impact of treatments on QOL and the need for long-term coping strategies.

Deciding which line of treatment to pursue can also be overwhelming. Steginga et al reported that most men desire to have an active role in treatment

decision making but several factors, including feeling uninformed and uncertain, poor social support, financial difficulty and higher cancer threat appraisal, may contribute to higher treatment decision making related distress.⁷

Finally, certain personality characteristics can also have a role in overall QOL and psychological adjustment to a cancer diagnosis, adherence, health behaviors and coping. In particular, neuroticism is a dispositional style that has been shown to significantly impact individual QOL.^{10–12} Neuroticism is the tendency to experience negative emotions, and view oneself and the world negatively. It is defined by irritability, sadness, anxiety, worry and self-consciousness.¹³ People with high levels of neuroticism endorse statements such as “I see myself as someone who worries a lot.”¹⁴ Neuroticism has been associated with several health outcomes, including disease recurrence, symptom manifestation, illness severity, treatment outcomes and even mortality.^{15–18}

Considering all of these factors, the aim of this current study was to identify the most informative sets of hypothesized variables associated with QOL in a sample of men treated for localized prostate cancer. This included anxiety and fear of cancer recurrence, neuroticism, urological and sexual dysfunction, and satisfaction with treatment decision making.

MATERIALS AND METHODS

Participants and Procedure

This study was approved by the participating institution internal review board. Data were included from 2 sources, including 1) recruitment in clinic and 2) an online health panel. For recruitment in clinic men diagnosed with clinically localized prostate cancer were recruited from the Northwestern University Department of Urology clinics as part of URO-QOL, an observational study of QOL. For the online health panel cross-sectional, retrospective data were collected from eligible men diagnosed with clinically localized prostate cancer from across the United States. All participants were identified and invited to participate through a national internet health panel maintained by OP4G (Opinions 4 Good, <http://op4g.com/>), which works in conjunction with nonprofit partners and their resources across the United States. All participants double opted in to complete our battery of questionnaires. Members of our group have successfully worked with OP4G on NIH (National Institutes of Health) funded studies.^{19–21} All patients were eligible for study if they were diagnosed with clinically localized or locally advanced prostate cancer, were 18 years old or older and were able to read, write, speak and understand English.

Study Measures

Certain patient reported outcomes measures were administered once to eligible study participants.

MAX-PC. MAX-PC is an 18-item self-report questionnaire that uses a 4-point Likert scale from 1—not at all to 4—often to assess prostate cancer anxiety, PSA anxiety and fear of recurrence in men with prostate cancer.²² In this study we used the first 11 questions to measure prostate cancer anxiety and the last 4 questions to measure fear of recurrence with internal consistency reliability of 0.92 and 0.83, respectively.

BFI Neuroticism Subscale. BFI is used to measure 5 widely accepted personality domains, including neuroticism, extroversion, agreeableness, conscientiousness and openness.¹⁴ We administered the neuroticism subscale, which consists of 8 items that use a 5-point Likert scale of 1—strongly disagree to 5—agree strongly. In this study internal consistency reliability was 0.95.

PROMIS Erectile Function and Sexual Satisfaction Forms. The PROMIS sexual function and satisfaction measures were used.²³ They include a 7-item self-report form developed to evaluate overall satisfaction with sex life and the sexual relationship with the partner as well as an 8-item form to measure erectile functioning. All items were rated on 6-point Likert scales. In this study internal consistency reliability was 0.91 for erectile function and 0.94 for sexual satisfaction. Information regarding scoring and additional validity data is available (<http://www.healthmeasures.net/explore-measurement-systems/promis>).

SOMS. Urinary and bowel side effects were measured using short forms of SOMS,²⁴ which is an extension of PROMIS methodologies and item development. The urinary subscale comprises 8 questions on urinary functioning in the previous week and the bowel subscale comprises 7 questions about bowel functioning in the prior week. Both use a 5-point Likert scale. In this study internal consistency reliability was 0.91 for the bowel and urinary subscales.

TDM-SAT Short Form. We created this 6-item short form of treatment decision making satisfaction. Item content originated from individual interviews and focus groups performed with men diagnosed with localized prostate cancer.²⁵ Items are rated on a 5-point Likert scale, including 1—not at all, 2—a little bit, 3—somewhat,

4—quite a bit and 5—very much. The context was, “Looking back at my treatment.” The items comprising the scale were 1) my treatment decision making options were clear to me, 2) it was easy for me to decide on the treatment that I chose, 3) I am satisfied with the level of communication that I had with my physician about my treatment, 4) overall, I am satisfied with my treatment decision making experience, 5) overall, I am satisfied with the treatment that I chose and 6) next year at this time I believe that I will continue to be satisfied with the treatment that I chose. Item-total correlations were high at between 0.85 and 0.91, and internal consistency reliability was 0.96. Factor analyses showed that 84% of the variance was explained by a single factor.

FACIT. QOL was assessed by a single FACIT item, “During the past 7 days, I am content with my quality of life right now.”^{26,27}

Analysis

We used SPSS®, version 23 to perform all analyses. Following the calculation of descriptive statistics we used Pearson correlations to determine the strength of association between QOL and hypothesized variables. All significant variables were entered as independent variables into time since treatment multiple regression models with QOL as the dependent variable. The adjusted R² statistic was evaluated to determine the amount of variability for which each set of variables accounted. Next, we reviewed the unique contribution of each variable by evaluating standardized regression coefficients (eg β weights), which may be interpreted in a similar way to an effect size or the average amount by which the dependent variable (QOL) increased for every 1 SD increase in the independent variable.

RESULTS

A total of 101 men were included from the recruitment in clinic and 701 were included from the online health panel. There were no significant differences between demographic or study measures between the samples. The supplementary table (<http://jurology.com/>) shows sociodemographic and clinical

Table 1. Measures in 802 patients

| | Mean \pm SD Score (time since treatment) | | | | Score Range |
|--|--|-------------------|----------------------|--------------------|-------------|
| | Less Than 12 Mos | 1–3 Yrs | Greater Than 3–5 Yrs | Greater Than 5 Yrs | |
| No. pts | 68–70 | 339–344 | 291 | 88–97 | — |
| FACIT QOL | 3.31 \pm 1.16 | 3.46 \pm 1.15 | 3.32 \pm 1.11 | 3.32 \pm 1.09 | 1–5 |
| MAX-PC: | | | | | |
| Prostate Ca anxiety | 5.83 \pm 2.43 | 5.07 \pm 2.48 | 5.39 \pm 2.31 | 5.47 \pm 2.18 | 0–33 |
| Recurrence fear | 7.38 \pm 3.05 | 6.65 \pm 3.22 | 7.37 \pm 2.62 | 7.68 \pm 2.75 | 0–12 |
| SOMS: | | | | | |
| Urinary problems | 51.25 \pm 9.64 | 48.96 \pm 10.19 | 50.23 \pm 8.87 | 52.54 \pm 8.48 | 28–75 |
| Bowel problems | 49.21 \pm 9.51 | 48.70 \pm 9.99 | 50.72 \pm 9.14 | 53.27 \pm 8.70 | 28–76 |
| PROMIS: | | | | | |
| Global sexual satisfaction | 43.77 \pm 8.00 | 46.13 \pm 8.58 | 45.25 \pm 7.83 | 46.85 \pm 7.55 | 29–66 |
| Erectile function | 50.49 \pm 7.87 | 53.20 \pm 7.80 | 51.22 \pm 6.32 | 51.64 \pm 5.25 | 33–70 |
| Treatment decision making satisfaction | 23.61 \pm 4.15 | 22.21 \pm 4.54 | 20.99 \pm 4.64 | 21.18 \pm 4.99 | 6–30 |
| BFI neuroticism | 26.02 \pm 6.65 | 24.91 \pm 5.21 | 24.55 \pm 4.91 | 25.14 \pm 3.97 | 8–40 |

Table 2. Correlations between patient reported outcomes measures and QOL in 802 patients

| | QOL Correlation | | | |
|--|------------------|---------|----------------------|--------------------|
| | Less Than 12 Mos | 1–3 Yrs | Greater Than 3–5 Yrs | Greater Than 5 Yrs |
| No. pts | 68–70 | 339–344 | 291 | 88–97 |
| MAX-PC: | | | | |
| Prostate Ca anxiety | –0.51* | –0.21* | –0.01 | 0.05 |
| Recurrence fear | –0.45* | –0.22* | 0.08 | 0.03 |
| SOMS: | | | | |
| Urinary problems | –0.33* | –0.19* | –0.17 | 0.03 |
| Bowel problems | –0.28† | –0.14* | –0.00 | 0.06 |
| PROMIS: | | | | |
| Global sexual satisfaction | 0.55* | 0.42* | 0.38* | 0.32* |
| Erectile function | 0.57* | 0.42* | 0.36* | 0.22† |
| Treatment decision making satisfaction | 0.53* | 0.31* | 0.42* | 0.53* |
| Neuroticism | –0.45* | –0.20* | –0.20* | –0.01 |

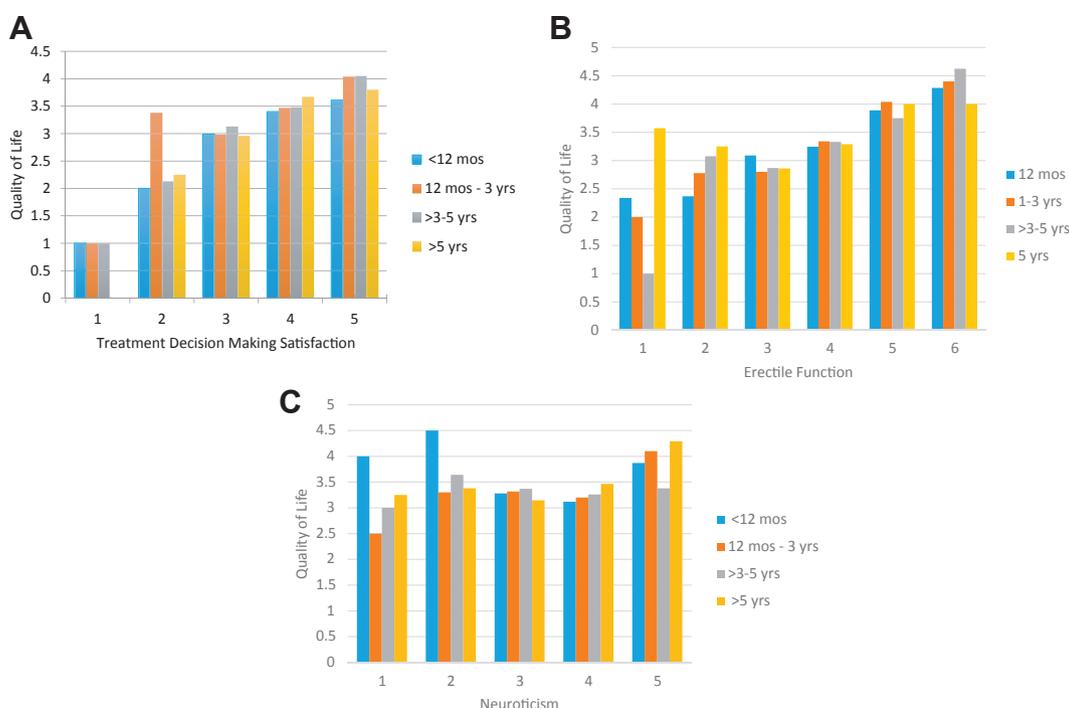
* $p < 0.01$.† $p < 0.05$.

information. Average age of respondents was 52 years and 73% of the men were white, 68% were married and 54% were employed. Participants varied in time since diagnosis and treatment, including less than 12 months in 70, 1 to 3 years in 344, greater than 3 to 5 years in 291 and greater than 5 years in 97. Of the sample 52% were treated with surgery alone, 28% were treated with radiation alone and 20% received a combination of the 2 treatments. Table 1 lists the mean \pm SD and score ranges for all patient reported measures.

In the first 2 time cohorts (less than 12 months and 1 to 3 years) QOL was significantly associated with all hypothesized variables ($p \leq 0.05$). In the greater than 3 to 5-year cohort sexual satisfaction, erectile function, satisfaction with treatment decision making and neuroticism were significantly related to QOL ($p \leq 0.01$). In the greater than 5-year cohort sexual satisfaction ($p \leq 0.01$), erectile function ($p \leq 0.05$) and treatment decision making satisfaction ($p \leq 0.01$) were significantly related to QOL. Table 2 lists correlations between QOL and hypothesized variables.

In regression models these sets of significant variables accounted for considerable variability in QOL scores, although this decreased by time cohort (see figure). The adjusted R^2 value for the less than 12-month group was 47% while it was 29% for the 1 to 3-year group, 27% for the greater than 3 to 5-year group and 22% for the greater than 5-year group.

Multiple regression also revealed which variables uniquely predicted QOL (table 3). Satisfaction with treatment decision making was the only variable to contribute uniquely to QOL across the cohorts of less than 12 months, 1 to 3 years, greater than 3 to 5 years and greater than 5 years (effect size 0.33, 0.27, 0.31 and 0.49, respectively, $ps < 0.01$). In the 1 to 3-year cohort erectile function and neuroticism similarly demonstrated unique associations with QOL scores (effect size 0.25 and 0.20, respectively),



A to C, associations between QOL and predictor variables at different times since treatment

Table 3. Multiple regression model of QOL across time since treatment cohorts

| | Less Than 12 Mos | | | 1–3 Yrs | | | Greater Than 3–5 Yrs | | | Greater Than 5 Yrs | | |
|--|--------------------------|---------|---------|--------------------------|---------|---------|--------------------------|---------|---------|--------------------------|---------|---------|
| | Standardized Coefficient | t Value | p Value | Standardized Coefficient | t Value | p Value | Standardized Coefficient | t Value | p Value | Standardized Coefficient | t Value | p Value |
| MAX-PC: | | | | | | | | | | | | |
| Prostate Ca anxiety | -0.44 | -1.79 | 0.08 | -0.02 | -0.21 | 0.84 | -0.06 | -0.66 | 0.51 | 0.09 | 0.59 | 0.56 |
| Recurrence fear | 0.36 | 1.34 | 0.19 | 0.08 | 0.90 | 0.37 | 0.12 | 1.42 | 0.16 | -0.21 | -1.34 | 0.18 |
| SOMS: | | | | | | | | | | | | |
| Urinary problems | 0.20 | 0.89 | 0.38 | 0.03 | 0.24 | 0.81 | 0.04 | 0.37 | 0.71 | -0.26 | -1.40 | 0.17 |
| Bowel problems | 0.04 | 0.21 | 0.83 | 0.19 | 1.57 | 0.12 | 0.02 | 0.14 | 0.89 | 0.18 | 1.03 | 0.31 |
| PROMIS: | | | | | | | | | | | | |
| Global sexual satisfaction | 0.33 | 1.53 | 0.14 | 0.13 | 1.37 | 0.17 | 0.16 | 1.71 | 0.09 | 0.13 | 0.91 | 0.36 |
| Erectile function | 0.25 | 1.12 | 0.27 | 0.25 | 2.47 | 0.01 | 0.09 | 1.02 | 0.31 | -0.11 | -0.81 | 0.42 |
| Treatment decision making satisfaction | 0.32 | 2.45 | 0.02 | 0.27 | 4.03 | 0.00 | 0.28 | 4.42 | 0.00 | 0.61 | 5.50 | 0.00 |
| Neuroticism | -0.11 | -0.58 | 0.56 | -0.20 | -2.44 | 0.02 | -0.11 | -1.62 | 0.11 | -0.05 | -0.41 | 0.68 |
| Adjusted R ² | 0.47 | | | 0.29 | | | 0.22 | | | 0.27 | | |

such that higher erectile function and neuroticism predicted lower QOL.

DISCUSSION

In this study we sought to determine the association between key hypothesized variables and QOL in men with localized prostate cancer. Our findings highlight the role of psychological and urological factors in QOL, and how time since diagnosis and treatment can influence which factors are most salient. While anxiety, fear of recurrence, and urinary and bowel problems were significantly associated with QOL early, these relationships became small and insignificant after the 3-year mark. Further, none uniquely predicted QOL at any time since treatment. Conversely, treatment decision making satisfaction, sexual satisfaction, erectile function and neuroticism were significantly associated with QOL early and for a longer time. The unique role of treatment decision making satisfaction, erectile function and neuroticism on QOL has important implications for how to best support men with prostate cancer.

Increased treatment decision making satisfaction was the only variable showing unique associations with QOL scores across all 4 time since treatment groups. This underscores the importance of the decision making process for patients and an opportunity for medical providers to engage men in shared treatment decision making approaches as a means of providing decisional support. It is also possible that cognitive dissonance may have contributed to patient satisfaction with decision making in the long term. Cognitive dissonance means that individuals may experience increasing discomfort when they hold 2 or more conflicting thoughts or behaviors. Accordingly, the patients in our sample may have been especially motivated to believe that they made the right treatment choice to avoid feelings of regret or dissatisfaction.

Our findings also demonstrate that sexual and erectile functioning is highly associated with QOL in the long term. Approximately a third of men encounter sexual problems at diagnosis while treatment of any form, even active surveillance, largely increases the chance of sexual dysfunction.²⁸ Pretreatment counseling and sexual value clarification can help patients set realistic expectations for sexual health and functioning in the short and long term following prostate cancer treatment.²⁹

The current study is one of the first to examine the role of neuroticism and its association with QOL after treatment for prostate cancer. Research in other clinical populations has repeatedly shown that individuals with higher levels of neuroticism report lower QOL,^{10–12} show greater reluctance

toward health care, report decreased ability to cope with cancer related stressors³⁰ and have increased mortality rates.^{13,15–18} Of interest, the relationship between prostate cancer anxiety, fear of recurrence and QOL lost significance after the 1 to 3-year posttreatment mark while neuroticism remained significantly associated with QOL into the greater than 3 to 5-year posttreatment time point. These findings may point to a notable difference between state and trait based anxiety, and their different relationships to QOL in the long term. Having a greater understanding of whether anxiety in a man is more situationally based (eg before prostate specific antigen or biopsy testing) or dispositional in nature (eg an underlying preoccupation and worry regardless of the situation) may help steer targeted psychosocial interventions to improve QOL and adherence to treatment and lifestyle regimens.

This study is not without limitations, which should be considered when interpreting its findings. 1) Our sample was drawn from a clinic and from an online medical panel. While the panel organization goes to great lengths to enroll, maintain, and verify the most up-to-date and accurate information on all of its members, these data were not directly taken from a hospital medical record or local facility. 2) It

is important to note that the data from the online panel were cross-sectional and, therefore, do not reflect how patient reports actually changed with time in a prospective, longitudinal manner. 3) Our outcome measure of treatment decision making satisfaction was developed and validated specifically for the purposes of this study. While we provided a transparent and reproducible description of the item content, and strong psychometric properties of its use with this sample, this measure will still benefit from additional confirmation and validation testing in other studies.

CONCLUSIONS

Future clinical research and practice will benefit from the continual, systematic assessment of QOL and contributing factors, especially those highlighted in this report. These data can help guide targeted psychosocial and behavioral support, thereby fostering comprehensive care for those affected by prostate cancer and its treatment.

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REFERENCES

- Christakis NA: Predicting patient survival before and after hospice enrollment. *Hosp J* 1998; **13**: 71.
- Bellizzi KM, Latini DM, Cowan JE et al: Fear of recurrence, symptom burden, and health-related quality of life in men with prostate cancer. *Urology* 2008; **72**: 1269.
- Geiger-Gritsch S, Oberaigner W, Muhlberger N et al: Patient-reported urinary incontinence and erectile dysfunction following radical prostatectomy: results from the European Prostate Centre Innsbruck. *Urol Int* 2015; **94**: 419.
- Parker PA, Davis JW, Latini DM et al: Relationship between illness uncertainty, anxiety, fear of progression and quality of life in men with favourable-risk prostate cancer undergoing active surveillance. *BJU Int* 2016; **117**: 469.
- Watts S, Leydon G, Birch B et al: Depression and anxiety in prostate cancer: a systematic review and meta-analysis of prevalence rates. *BMJ Open* 2014; **4**: e003901.
- Bokhour BG, Clark JA, Inui TS et al: Sexuality after treatment for early prostate cancer. *J Gen Intern Med* 2001; **16**: 649.
- Steginga SK, Turner E and Donovan J: The decision-related psychosocial concerns of men with localised prostate cancer: targets for intervention and research. *World J Urol* 2008; **26**: 469.
- Baker F, Denniston M, Smith T et al: Adult cancer survivors: how are they faring? *Cancer* 2005; **104**: 2565.
- Thompson I, Thrasher JB, Aus G et al: Guideline for the management of clinically localized prostate cancer: 2007 update. *J Urol* 2007; **177**: 2106.
- Boosman H, Winkens I, van Heugten CM et al: Predictors of health-related quality of life and participation after brain injury rehabilitation: the role of neuropsychological factors. *Neuropsychol Rehabil* 2015; doi: 10.1080/09602011.2015.1113996.
- Zarbo IR, Minacapelli E, Falautano M et al: Personality traits predict perceived health-related quality of life in persons with multiple sclerosis. *Mult Scler* 2016; **22**: 551.
- Ibrahim N, Teo SS, Che Din N et al: The role of personality and social support in health-related quality of life in chronic kidney disease patients. *PLoS One* 2015; **10**: e0129015.
- Lahey BB: Public health significance of neuroticism. *Am Psychol* 2009; **64**: 241.
- John OP and Srivastava S: The Big Five trait taxonomy: history, measurement, and theoretical perspectives. In: *Handbook of Personality: Theory and Research*, 2nd ed. Edited by LA Pervin and JP Oliver. New York: Guilford Press 1999; chap 4, pp 102–138.
- Koh JS, Ko HJ, Wang SM et al: The association of personality trait on treatment outcomes in patients with chronic prostatitis/chronic pelvic pain syndrome: an exploratory study. *J Psychosom Res* 2014; **76**: 127.
- Telles-Correia D, Barbosa A, Mega I et al: Psychiatric and psychosocial predictors of medical outcome after liver transplantation: a prospective, single-center study. *Transpl Proc* 2011; **43**: 155.
- Hayward RD, Taylor WD, Smoski MJ et al: Association of five-factor model personality domains and facets with presence, onset, and treatment outcomes of major depression in older adults. *Am J Geriatr Psychiatry* 2013; **21**: 88.
- Kim SY, Kim JM, Stewart R et al: Influences of personality traits on quality of life after stroke. *Eur Neurol* 2012; **69**: 185.
- Carlozzi NE, Victorson D, Sung V et al: HD-PRO-TRIAD validation: a patient-reported instrument for the symptom triad of Huntington's disease. *Tremor Other Hyperkinet Mov (N Y)* 2014; **4**: 223.
- Forrest CB, Bevans KB, Pratiwadi R et al: Development of the PROMIS pediatric global

- health (PGH-7) measure. *Qual Life Res* 2014; **23**: 1221.
21. Lai JS, Cella D, Yanez B et al: Linking fatigue measures on a common reporting metric. *J Pain Symptom Manage* 2014; **48**: 639.
22. Roth AJ, Rosenfeld B, Kornblith AB et al: The memorial anxiety scale for prostate cancer: validation of a new scale to measure anxiety in men with prostate cancer. *Cancer* 2003; **97**: 2910.
23. Flynn KE, Lin L, Cyranowski JM et al: Development of the NIH PROMIS (R) Sexual Function and Satisfaction measures in patients with cancer. *J Sex Med, suppl.*, 2013; **10**: 43.
24. Zapf M, Denham W, Barrera E et al: Patient-centered outcomes after laparoscopic cholecystectomy. *Surg Endosc* 2013; **27**: 4491.
25. Victorson D, Mendoza-Temple L, Takagishi C et al: Tailoring supportive care interventions to men diagnosed with prostate cancer. *Psychooncology, suppl.*, 2009; **18**: S1.
26. Cella D: *Manual of the Functional Assessment of Chronic Illness Therapy (FACIT Scales)*. Evanston, Illinois: Center on Outcomes, Research and Education (CORE), Evanston Northwestern Healthcare and Northwestern University 1997.
27. Webster K, Cella D and Yost K: The Functional Assessment of Chronic Illness Therapy (FACIT) measurement system: properties, applications, and interpretation. *Health Qual Life Outcomes* 2003; **1**: 79.
28. Schover LR: Sexual healing in patients with prostate cancer on hormone therapy. *Am Soc Clin Oncol Educ Book* 2015; **35**: e562.
29. Paich K, Dunn RL, Skolarus T et al: Preparing patients and partners for the recovery from the side-effects of prostate cancer surgery: a group approach. *Urology* 2016; **88**: 36.
30. Lattie EG, Asvat Y, Shivpuri S et al: Associations between personality and end-of-life care preferences among men with prostate cancer: a clustering approach. *J Pain Symptom Manage* 2015; **51**: 52.