

The association between partner support and psychological distress among prostate cancer survivors in a nationwide study

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Abstract

Purpose Up to 38 % of prostate cancer survivors experience significant psychological distress; 6–16 % are diagnosed with depression or anxiety disorders. Support from a relationship partner can ameliorate psychological distress, but many studies treat relationship status as a dichotomous predictor without accounting for level of support provided by the partner.

Methods The current study is a secondary analysis of a sample of 292 prostate cancer survivors recruited by nine Community Clinical Oncology Program (CCOP) sites around the USA to a larger randomized controlled trial. Self-reported

distress was measured at a baseline visit using the Profile of Mood States (POMS) and partner support was measured using the Social Network and Support Assessment (SNSA). Post hoc groups consisting of unmarried survivors, married survivors with low partner support (SNSA scores below the median), and married survivors with high partner support (SNSA scores above the median) were compared on distress using univariate and analysis of covariance (ANCOVA) analyses.

Results Married prostate cancer survivors with high partner support reported significantly lower levels of psychological distress than the other two groups on the total distress scale (16.20–19.19 points lower, $p < 0.001$). After adjusting for multiple comparisons, this pattern was also seen for subscales of distress.

Conclusions This study highlights the importance of assessing both partner support and marital status when evaluating a survivor's psychosocial functioning and support network.

Implications for Cancer Survivors Assessing support could improve understanding of the association between partner support and prostate cancer survivors' psychological distress and could lead to interventions to bolster support and reduce distress.

Keywords Prostate cancer · Men · Psychological distress · Social support · Marriage

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White, African-American, American Indian, and Hispanic/Latino men [1]. Given its high incidence rate and many treatment-related side effects, diagnosis and treatment of prostate cancer can be stressful for men and their families [2]. Prostate cancer and treatment can negatively affect urinary, bowel, and sexual functioning, leading many men to feel anxious about their health, longevity, and masculinity [3]. To encapsulate the range of psychological difficulties experienced by cancer survivors, including prostate cancer survivors, the National Comprehensive Cancer Network (NCCN) has advanced the term “distress,” defined as any unpleasant emotional, psychological, social, or spiritual experiences associated with cancer [4]. This intentionally broad construct ranges from mild sadness and fear to significant psychological difficulties, including depression and anxiety [5]. Studies have found that between 14 and 38 % of men with prostate cancer are significantly distressed [6–8], 8.1 to 15.2 % experience symptoms of depression, and 17.8 to 32.6 % experience symptoms of anxiety [9–11]. Targeting distress has potential to reduce the public health burden of long-term care for prostate cancer survivors by reducing morbidity and improving quality of life [12].

Prostate cancer impacts not only the cancer survivor, but the survivor’s relationships and support system [13–15]. Relationship partners, in particular, have a potent influence on the health and well-being of prostate cancer survivors [16, 17]. Psychological distress is significantly correlated between partners and prostate cancer survivors [18, 19] and is increased by negative relationship interactions [20], poor communication, and reduced support [21]. The theoretical link between interpersonal relationship processes, and relationship support in particular, and psychological distress has been underscored by Wortman’s theory of interpersonal relationships and cancer, derived from Coyne’s interpersonal model of depression [22]. This theory states that cancer patients and survivors seek support from relationship partners to cope with feelings of uncertainty engendered by the cancer diagnosis, and that receiving this support reduces uncertainty and concomitant distress. Tenets of Wortman’s theory have been tested in multiple research studies over the past 35 years [23–25].

Many studies of the association between relationship factors and distress in the context of prostate cancer have focused exclusively on the experience of the cancer survivor’s relationship partner or have used complicated and time-intensive assessments of the communication between survivors and partners. Many other studies highlighting the association between relationship factors and cancer-related distress have looked at marital status as a dichotomous predictor, in which a cancer survivor is either married or unmarried [26, 27]. While time-intensive assessments of relationship dynamics may not be feasible for all research studies or clinical settings, dichotomizing relationship status ignores the association between relationship support and well-being. Characterizing the

impact of support provided by a relationship partner to the prostate cancer survivor in a parsimonious fashion will allow for the development of more nuanced models, and perhaps more effective screening, of psychosocial functioning and psychological distress among prostate cancer survivors [28, 29].

The current study adds to the literature on prostate cancer survivors and their partners by using a brief assessment to characterize the association between perceived partner support and self-reported psychological distress among 292 prostate cancer survivors. We tested two primary and six exploratory hypotheses. We first hypothesized that prostate cancer survivors who are married would report lower levels of overall psychological distress than those who are unmarried (never married, divorced, separated, or widowed). We further hypothesized that higher levels of partner support among those who are married would be associated with lower levels of psychological distress, adding additional nuance to an examination of psychological functioning based solely on dichotomous marital status. In our exploratory hypotheses, we examined whether these findings were mirrored for specific types of distress (i.e., tension/anxiety, depression, anger/hostility, fatigue, confusion, and vigor).

Methods

The current study was conducted across nine University of Rochester Cancer Center Community Clinical Oncology Program (URCC CCOP) sites in Arizona, California, Illinois, Kansas, Michigan, Minnesota, New York, North Carolina, and Washington. The Institutional Review Board of the University of Rochester and at each participating site approved the protocol and procedures described below. All participants provided informed consent to participate in the research.

Participants for the current study were recruited into a randomized controlled trial of supportive-expressive group therapy (intervention) vs. educational material (control). Both the intervention and control groups completed assessments at baseline (prior to the first group therapy session), as well as at time points post-intervention. Data for the current study are drawn from the baseline assessment. Methodology for this trial is also described in brief elsewhere [30]. This baseline assessment consisted of paper-and-pencil questionnaires mailed to the participants’ homes, which measured sociodemographic and medical variables including psychological distress and social interaction and support. Recruitment and enrollment occurred within 36 months of the survivor’s diagnosis; baseline questionnaires were mailed to participants immediately following enrollment.

Participants

Participants were recruited from community clinical oncology practices throughout the USA under the NCI-funded URCC CCOP. Additional participants were recruited from medical centers at Stanford University and University of Rochester. Participants were referred by physicians and then given information on the study by research coordinators.

Inclusion criteria for the study specified that participants (a) were men diagnosed with a first occurrence of biopsy-proven clinical stage T1b, T1c, or T2 NO or NX, MO prostate cancer; (b) had to be followed by a urologist, medical oncologist, or radiation therapist at least semiannually; (c) could have had no other cancers (except basal cell or squamous cell carcinoma) in the past 10 years; (d) could have had no history of major psychiatric illness requiring hospitalization or medication (other than depression or anxiety for less than 1 year).

A total of 329 prostate cancer survivors met these inclusion criteria. Of these, 292 men provided useable data and were included in the analyses detailed below. The other 37 men did not respond either to the Profile of Mood States (POMS; 24 men) or the Social Network and Support Assessment (SNSA; 13 men).

Measures

Demographic and clinical characteristics Participants completed a demographic questionnaire assessing age, marital status, race, education, employment, and family income. Information was also collected on each participant's clinical status (e.g., cancer stage).

Mood disturbance The Profile of Mood States (POMS), a 65-item scale designed to measure affective states, has well-established reliability and validity and has been used in previous studies of prostate cancer survivors [31]. Respondents are asked to rate to what degree they experience different affective states (e.g., angry, tense, energetic) on a five-point Likert scale (1=not at all, 5=extremely). Subscales measure domains of distress: tension-anxiety, depression, anger-hostility, vigor, fatigue, and confusion-bewilderment. Overall mood disturbance is calculated by summing items from all of the subscales save vigor and subtracting out the subscale score for vigor, with higher scores representing greater mood disturbance. Cronbach's alpha for the POMS overall mood scale in the current sample indicated good reliability ($\alpha=0.90$), while alphas for the subscales ranged from 0.79 (confusion) to 0.91 (vigor).

Partner support The Social Network and Support Assessment (SNSA) is a 17-item measure assessing multiple dimensions of perceived support, used previously in studies of cancer survivors [32, 33] and derived from an epidemiological

study of social networks among older adults [34]. Respondents are asked to characterize the level of support they receive from various sources, including their relationship partners. For the current study, only the seven items directly assessing partner support were considered (e.g., "How often is your spouse/partner willing to listen when you need to talk about your worries or problems?"). These items are answered on a five-point Likert scale (1=not at all, 5=frequently) and were summed to provide an overall score for level of perceived partner support. The continuous sum was split at the median into high support and low support categories, allowing us to characterize those who were unmarried, married with low partner support, and married with high partner support. Cronbach's alpha for the SNSA partner support scale in the current sample indicated good reliability ($\alpha=0.92$).

Data analysis

We first examined descriptive statistics for demographic variables such as race, age, education level, employment status, and cancer stage. We also examined demographic differences between the groups of participants who were unmarried, married with low partner support, and married with high partner support, using *t*-tests for continuous variables and chi-square tests for categorical variables. We compared unmarried to married men on the continuous POMS total score using independent samples *t*-tests without accounting for level of partner support. We compared unmarried to unmarried men on POMS subscale scores using independent samples *t*-tests with a Sidak correction for multiple comparisons, setting the $\alpha=0.008$. We then compared the three groups of men categorized by marital status and partner support on the POMS total score using an analysis of covariance (ANCOVA) model, controlling for demographic differences between the three groups. We tested assumptions of the ANCOVA method (i.e., that the residuals were normally and independently distributed and that no interactions existed) and found that these assumptions were not violated [35]. Finally, we compared the three groups of men categorized by marital status and partner support on POMS subscale scores using an ANCOVA model with Sidak correction for multiple comparisons, setting the $\alpha=0.008$. Analyses were performed using SPSS (version 20.0).

Results

Participant characteristics

The sample of 292 men was 90.8 % ($n=265$) Caucasian. Mean age in years was 65.98 (range 46 to 86; SD=8.34). Modal level of education was some college or college graduate (38.4 %, $n=112$). The majority of men (58.9 %, $n=172$)

were unemployed. Modal income range was \$20,000 to \$39,999 (25.3 %, *n*=74). The majority of men (85.3 %, *n*=249) were married or in a committed relationship; 5.5 % (*n*=16) were divorced; 4.1 % (*n*=12) were widowed; 3.8 % (*n*=11) had never been married; and 1.4 % (*n*=4) were separated. A total of 88.4 % of the men in the sample (*n*=258) had at least one biological child. A total of 60.6 % of men in the sample (*n*=177) reported a diagnosis of stage T2 prostate cancer. The average time since diagnosis was 14.07 months (range 2.30 to 37.67 months, *SD*=9.17). The majority of participants were not put on long-term hormone therapy (i.e., received orchiectomy or prostatectomy; 83.9 %, *n*=245); 11.3 % (*n*=33) were put on standard hormone therapies (e.g., luteinizing hormone agonists), and 4.8 % (*n*=14) were put on anti-androgen monotherapy. See Table 1 for demographic and clinical characteristics.

Comparing the 37 men who did not provide complete data to the 292 men who provided complete data, the men who did not provide complete data (i.e., did not respond to either the POMS or the SNSA) were more likely than those who provided complete data to be African-American ($\chi^2=10.85, p=0.001$) and have a high school education or lower ($\chi^2=10.85, p=0.001$). Accordingly, race and education were used as covariates in the following analyses.

In total, of the 292 men who provided complete data, 52 men were unmarried (single/divorced/widowed/separated), 102 were married with low partner support, and 138 were married with high partner support. African-American men with prostate cancer were slightly but significantly less likely to be in the high partner support category ($\chi^2=10.85, p=0.03$). Men with stage 2 or 3 prostate cancer were slightly but significantly more likely to be in the high partner support category ($\chi^2=6.79, p=0.03$). Accordingly, race (as stated above) and stage of cancer were used as covariates in the following analyses. No other differences were noted between the marital status and support categories.

We examined any differences in psychological distress as a result of length of survivorship/time since diagnosis. Time since diagnosis was negatively but nonsignificantly associated with distress ($r=-0.33, p=0.13$). Accordingly, we did not control for time since diagnosis in further analyses.

Dichotomous marital status and psychological distress

Examining the dichotomous categorization of participants as either unmarried (single/divorced/widowed/separated) or married without accounting for level of partner support, those who were unmarried reported significantly higher scores on the POMS total distress score ($M=14.77, 95\%$ confidence interval (CI)=5.04–24.50) than those who were married ($M=-0.87, 95\%$ CI=-3.78–2.04; $t=3.10, p=0.003$). Results for the POMS subscales mirrored the result for the total score. Participants who were unmarried reported significantly higher

Table 1 Demographic and clinical characteristics of the current sample (*N*=292)

Characteristic	Number (%)
Sex	
Male	292 (100)
Race/ethnicity	
Hispanic/Latino	3 (1.0)
Non-Hispanic White	265 (90.8)
Non-Hispanic Black	22 (7.5)
Asian/Asian American	2 (0.7)
Age, mean (SE)	65.98 (8.34)
Education	
Less than high school	16 (5.5)
High school graduate	59 (20.2)
Completed trade school	21 (7.2)
Some college	73 (25.0)
Bachelor’s degree	39 (13.4)
Some graduate school	20 (6.8)
Postbaccalaureate degree	64 (22.0)
Employment status	
Unemployed/retired	172 (58.9)
Employed part time	30 (10.3)
Employed full time	90 (30.8)
Income	
Less than \$20,000	19 (6.5)
\$20,000–\$39,999	74 (25.3)
\$40,000–\$59,999	70 (24.0)
\$60,000–\$79,999	31 (10.6)
\$80,000–\$99,999	21 (7.2)
\$100,000 or above	40 (13.7)
Do not know/refused to answer	37 (12.7)
Marital status	
Married	249 (85.3)
Single/never married	11 (3.8)
Separated	4 (1.4)
Divorced	16 (5.5)
Widowed	12 (4.1)
Cancer stage	
T1b	12 (4.1)
T1c	99 (33.9)
T2	177 (60.6)
T3	4 (1.4)
Months since diagnosis, mean (SE)	14.07 (9.17)
Treatment	
No long-term hormone therapy	245 (83.9)
Standard hormone therapy	33 (11.3)
Antiandrogen monotherapy	14 (4.8)

scores than those who were married on the POMS depression ($t=3.78, p<0.001$) and fatigue subscales ($t=2.35, p=0.02$).

For the POMS vigor subscale, where higher values represent better functioning, participants who were unmarried reported significantly lower scores than those who were married ($t=-3.53, p<0.001$).

Partner support and psychological distress

As assumptions for the ANCOVA model were not violated, we proceeded to use this method to compare the three groups of participants categorized by marital status and partner support (unmarried, married with low partner support, and married with high partner support). The mean score on the POMS total distress scale was highest in those who were unmarried ($M=14.77, 95\% \text{ CI}=5.04\text{--}24.50$), intermediate among those who were married with low partner support ($M=11.78, 95\% \text{ CI}=0.99\text{--}22.56$), and lowest among those who were married with high partner support ($M=-4.42, 95\% \text{ CI}=-8.02\text{ to }-0.82$). The omnibus difference was statistically significant ($F=12.62, p<0.001$). The contrast between unmarried participants and those who were married with low partner support was nonsignificant ($t=0.41, p=0.69$). The contrast between unmarried participants and those who were married with high partner support was significant ($t=3.43, p=0.001$). The contrast between the those who were married with low partner support and those who were married with high partner support was significant ($t=4.55, p<0.001$); those who were married with high partner support reported significantly lower distress scores than the other two groups.

These results were unchanged by controlling for education level, race/ethnicity, and stage of cancer. Education emerged as an independently significant predictor of distress, with individuals who reported a higher level of education also reporting lower psychological distress ($F=8.32, p=0.004$). However, even accounting for education as a covariate, the association between partner support and distress remained significant and unchanged.

Results for the POMS subscales mirrored the results for the total score (see Table 2 for the results of the ANCOVA analyses). For all POMS subscales, differences between the three categories of participants (unmarried, married with low partner support, and married with high partner support) were statistically significant. Examination of means revealed that those who were unmarried reported the highest scores on the POMS tension-anxiety, depression, fatigue, and confusion-bewilderment subscales, followed by those who were married with low partner support, and then those who were married with high partner support. For the POMS vigor subscale, the opposite pattern held true: those who were married with high partner support reported the highest scores, followed by those with low partner support, and then those who were unmarried. Finally, for the anger-hostility subscale, those who were married with low partner support reported the highest scores, followed by those who were unmarried, and those who were married with high partner support. The contrast between the unmarried and those who were married with high partner support was significant for depression ($t=6.48, p<0.001$), confusion ($t=2.54, p<0.001$), and vigor ($t=-3.32, p=0.003$). The contrast between those who were married with low partner support and those who were married with high partner support was significant for depression ($t=4.67, p=0.007$), anger-hostility ($t=3.20, p=0.006$), confusion ($t=2.54, p=0.006$), and vigor ($t=-3.67, p<0.001$). All contrasts between the unmarried and those who were married with low partner support were nonsignificant. These results were unchanged by controlling for education level, race/ethnicity, and stage of cancer.

Discussion

Results of the current study indicate that support from a marital partner is closely associated with self-reported psychological

Table 2 ANCOVA results for POMS total and subscale scores by level of relationship support, adjusted for education level, race/ethnicity, and cancer stage ($N=292$)

	Total mean (SD), $N=292$	Unmarried, $N=52$	Married/low support, $N=102$	Married/high support, $N=138$	F value
POMS total	1.65 (0.52)	14.77 (0.53)	11.78 (0.53)	-4.42 ^{a,b} (0.51)	$F(2, 207)=12.62, p<0.001$
Tension-anxiety	2.70 (4.87)	4.23 (5.27)	3.52 (4.96)	2.06 (4.62)	$F(2, 207)=3.82, p=0.02$
Depression	6.16 (7.34)	10.70 (9.35)	8.89 (8.11)	4.22 ^{a,b} (5.52)	$F(2, 207)=17.25, p<0.001$
Anger-hostility	4.62 (5.61)	5.93 (6.98)	6.96 (5.18)	3.76 ^b (5.02)	$F(2, 207)=5.36, p=0.005$
Fatigue	5.98 (4.80)	7.56 (5.34)	6.41 (3.81)	5.41 (4.71)	$F(2, 207)=3.50, p=0.03$
Confusion	0.87 (3.74)	2.56 (5.00)	2.56 (4.28)	0.01 ^{a,b} (2.78)	$F(2, 207)=11.90, p<0.001$
Vigor	18.69 (5.50)	16.21 (5.78)	16.56 (5.06)	19.88 ^{a,b} (5.13)	$F(2, 207)=10.51, p<0.001$

^a Value differs from the unmarried group at $p<0.01$ (after correction for multiple comparisons)

^b Value differs from the married/low support group at $p<0.01$ (after correction for multiple comparisons)

distress among prostate cancer survivors. Furthermore, an assessment of partner support reveals subgroup differences in psychological distress that are not captured by an assessment of dichotomous marital status alone. In this cross-sectional, quasi-experimental study, men with prostate cancer who were married but reported low support from their partners were no different in overall level of psychological distress than men who were unmarried, while men with prostate cancer who were married and reported high support from their partners were significantly less distressed. These results were mirrored in analyses of specific subscales of distress.

Calls have sounded for interventions that specifically examine and adapt to a survivor's level of distress [29]. As highlighted by a recent study on distress in couples affected by prostate cancer [36], measurement of psychological reactions in male survivors is complicated by masculine gender role expectations. Men are expected to remain stoic, avoid expressing emotions, and handle problems as they arise [37, 38]. The complexity of dealing with a diagnosis of cancer can challenge this role expectation [39, 40], but also make it less likely that a male cancer survivor will report distress. Studies designed to measure and address distress in prostate cancer survivors have been hindered by reporting issues and by apparent differences between men reporting high distress and men reporting low or no distress [41].

The current study offers a proxy variable that could inform future studies of distress among men with prostate cancer. An assessment of partner support may circumvent reticence to disclose feelings of distress, as previous research has indicated that prostate cancer survivors may be reluctant to present for evaluation or treatment directly targeting psychological distress [10]. Assessing a related but distinct construct, such as partner support, may thereby provide valuable insight into a prostate cancer survivor's psychosocial functioning. Such an assessment would ideally be administered to both the prostate cancer survivor and his partner, so as to unpack the dyad's perception of support within their relationship. Future studies might go beyond measures of perceived support and assess functional domains that could both impact the relationship between a prostate cancer survivor and his partner and also be of primary concern to a prostate cancer survivor posttreatment, such as physical and sexual functioning [42, 43].

Given the association between support and psychological distress, interventions aimed at bolstering partner support may affect distress. Though the current study is cross-sectional and cannot assess whether the prostate cancer survivor's distress or lack of partner support was primary, previous studies of depression in romantic partnerships have indicated that depression and relationship distress tend to co-occur and reinforce one another, even when depression precedes relationship distress and is distinct from relationship difficulties [44, 45]. The same cannot be said of interventions that address only psychological

distress; such interventions typically do not improve relationship functioning [46].

Study limitations

The current study has several limitations that should be taken into account when interpreting its findings. First, this was a secondary analysis of baseline data collected as part of a randomized clinical trial. The trial was not designed to look at level of partner support or to examine associations between partner support and distress. The number of survivors reporting that they were unmarried or married with low partner support was smaller than the number of survivors reporting high partner support, and no participants reported being in committed, nonmarital relationships. The social support groups were formed post hoc, and additional, unmeasured confounding variables may have been associated with participants' marital status or level of partner support. Future studies examining support in prostate cancer survivors should make an effort to recruit survivors along a spectrum of relationship types and levels of support, and to include same-sex and nonmarital relationships. Second, data for this analysis were cross-sectional, self-report, and obtained only from one member in the relationship. We can draw no conclusions regarding the impact of partner support on long-term adjustment post-prostate cancer diagnosis, and we cannot correlate the prostate cancer survivors' report of support received with the partners' report of support offered, and vice versa. Future studies may consider using brief, validated dyadic communication tasks for an *in vivo* perspective on a couple's relationship functioning and support, in addition to self-report measures. Finally, though survivors were recruited from nine geographically distinct locations around the USA, allowing for some level of generalizability, it may be that prostate cancer survivors who agree to be part of a clinical trial of a group therapy intervention are different from prostate cancer survivors in general. Future evaluations of the link between support and distress might consider assessing survivors in community clinics, at a range of survivorship stages, without the eligibility restrictions of a randomized clinical trial.

Conclusion

Despite these limitations, the current study offers a unique perspective on the association between partner support and psychological distress among prostate cancer survivors. The findings of this study highlight the importance of looking beyond dichotomous relationship status when assessing psychosocial functioning. Future research is needed to establish parsimonious ways to assess relationship functioning in prostate cancer survivors, examine relationship characteristics

underlying low and high levels of support, and delineate specific dimensions of relationship support that most affect survivor distress. Including even a single-item assessing relationship quality, such as the omnibus relationship satisfaction item from the Dyadic Adjustment Scale [47], would add to future studies' assessment of psychosocial functioning. Clinicians working with prostate cancer survivors might consider meeting with or asking about survivors' partners so as to gain perspective on level of support within the relationship. Finally, it will be important to expand these findings to other cancer populations and, from there, formulate efficacious interventions that both capitalize on support offered by relationship partners and can reduce rates of psychological distress.

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Conflict of interest Drs. Kamen, Mustian, Heckler, Janelsins, Peppone, Mohile, McMahon, Lord, Flynn, Weiss, Spiegel, and Morrow declare that they have no conflicts of interest.

Informed consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study.

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