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Dispositional Optimism as a Predictor of Decision-Related Distress after Localized Prostate Cancer

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Abstract

This study investigated prospectively the relationship between optimism, threat appraisal, seeking support and information, cognitive avoidance, physical treatment side effects, and decision-related distress in 111 men with localized prostate cancer. Men were assessed at diagnosis, and two and twelve months after treatment. Baseline decision-related distress predicted distress two and twelve months after treatment. Optimism was a significant prospective and concurrent predictor of decision-related distress with the effect mediated by proximal cancer threat appraisal. Seeking support and information and cognitive avoidance were not associated with decision-related distress at any time point. For physical treatment side effects, concurrent urinary symptoms were predictive of decision-related distress two months after treatment. Results suggest that decision-related distress is generated by similar processes to that of the psychological distress that follows a cancer diagnosis. Screening for men with high decision-related distress for referral to in-depth decision support is suggested. Outcome expectations may present as a therapy target to increase the effectiveness of decisional support that is utility based.

Key words. Decision-related distress; optimism; threat appraisal

The diagnosis of cancer is for most people a major life stress and heightened levels of psychological distress, particularly anxiety, are common. (Massie & Holland, 1990; Spencer, Carver, & Price, 1998) Problematically, this is also a time when patients will be asked to make decisions about potentially invasive and unpleasant medical treatments with patient involvement considered essential to ensure informed consent. (Frosch & Kaplan, 1999) There are a number of reasons why patients may find this difficult. First, cancer treatment methods are often complex and difficult for lay people to understand. (Fallowfield, Ford, & Lewis, 1995) Second, anxiety itself can impair a person's ability to retain information and problem solve effectively. (Fiedler, 1988; Luce, Bettman, & Payne, 1997; McVea, Minier, & Johnson Palensky, 2001) Thus, decision-related distress is an important adjustment outcome, particularly in contexts such as localized prostate cancer, when there is uncertainty about the optimal treatment, high potential risks and benefits of treatment, and where patients' preferences for health outcomes may vary. (Barry, 1999; O'Connor, 1995)

Specifically, prostate cancer is a heterogeneous disease and the risk of mortality from localised disease is difficult to quantify owing to the cancer's relatively slow growth rate. (Schmid, McNeal, & Stamey, 1993) For example, 30-40% of all men aged over 50 years will be estimated to have histological evidence of prostate cancer, but of these men only one in four men will develop clinically evident disease and only 1 in 14 will have disease that will prove lethal. (Abbas & Scardino, 1997) This means that many prostate cancers are not life threatening and treatment for men in this category may provide no potential benefit. On this basis, after the diagnosis of localized prostate cancer it is recommended that all men be advised of three possible treatment options at a minimum: watchful waiting (no active treatment), radiation therapy, or radical prostatectomy. (Australian Cancer Network Working Party on Management of Localised Prostate Cancer, 2002) Watchful waiting reserves medical treatment for symptoms of prostate cancer, while not actively attempting to cure the

cancer. In doing so, watchful waiting preserves quality of life but misses the opportunity for cure. By contrast, potentially curative treatments for localized prostate cancer such as surgery or radiation therapy have a range of deleterious iatrogenic side effects including impotence and urinary incontinence. (Potosky et al., 2000) Therefore, men with localized prostate cancer are faced with a difficult treatment decision, making decision-related distress a highly salient aspect of their illness experience.

Decisional support interventions have emerged as a promising area of research to assist patients to participate effectively in uncertain treatment decisions. (Edwards & Elwyn, 1999; Llewellyn-Thomas, 1995) Typically, these interventions convey information about the potential benefits and costs of medical treatments, and suggest strategies to guide decision making such as deliberation about and enactment of the patient's preferred decision making role and values clarification exercises. In such studies, decision-related distress is often described as decisional conflict. On this view, decision-related distress encompasses an individual's perception of the level of difficulty in making a decision and includes perceived uncertainty in choosing, feeling uninformed and unsupported in decision making, feeling unclear about personal preferences and being satisfied with the decision that has been made. (O'Connor, 1995) To date, studies assessing the effectiveness of decisional support interventions have had mixed results, with a frequent limitation the failure to delineate a theoretical model of the factors that contribute to decision-related distress. (Molenaar, Sprangers, Postma-Shuit, Hendriks, & De Haes, 2000) In this regard, to our knowledge no studies have investigated psychological predictors of decision-related distress.

A variable that has been found to be predictive of a person's psychological adjustment to cancer is *optimism*. (Scheier & Carver, 1985)construed dispositional optimism as a stable personality characteristic where a person has generalized outcome expectancies that lead them to expect either positive or negative outcomes to result from events. A person who has

positive expectancies about cancer may be more likely to appraise the cancer as a manageable threat, thereby moderating their psychological adjustment to the cancer. It has also been proposed that optimism may influence psychological distress by affecting the person's coping. On this view, an optimistic person will be more likely to appraise their cancer as something they can influence towards a positive outcome. (Folkman & Greer, 2000) Thus, an optimistic person will be more likely to engage in active coping to manage the experience of cancer whereas a pessimistic person would be more likely to withdraw and use a strategy such as avoidance to lessen his awareness of the problem. (Scheier & Carver, 1992) Consistent with this, studies have found that in people with cancer, optimism is related to better psychological and social adjustment, less anxiety and depression, less mood disturbance and more active coping. (Bjorck, Hopp, & Jones, 1999; Carver et al., 1993; Schnoll, Knowles, & Harlow, 2002) Variables that have been found to mediate the effect of optimism include cognitive avoidant and disengagement coping, and more recently perceived stress management skills. (Epping-Jordan, Compas, & Howell, 1994; Penedo et al., 2003; Stanton & Snider, 1993)

The present study examined prospectively the association between decision-related distress and optimism, cancer threat appraisal, support and information seeking, and cognitive avoidance coping in men with localized prostate cancer. We hypothesized that consistent with previous research on psychological adjustment to cancer, higher decision-related distress would be predicted by lower optimism. As well, we hypothesized that men who were more optimistic would have a more positive cancer threat appraisal, and that this in turn would lead to less cognitive avoidance and more active coping, in particular seeking support and information. Individuals who were less avoidant and who actively sought support and information would have an enhanced ability to make a decision about treatment and would therefore experience less decision-related distress. Finally, a previous study of men with

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prostate cancer found that urinary function and bother were associated with dissatisfaction with treatment. (Carvalhal et al., 1999) Accordingly, we expected that urinary, sexual and bowel problems may have an independent effect on decision-related distress, with greater physical problems increasing distress (see Figure 1).

Method

Participants

Participants in the study were recruited from outpatient urology clinics and four urologists. Inclusion criteria were that the men must: (1) have been newly diagnosed with localized prostate cancer (2) be able to read and speak English (3) live close enough for assessment (4) have no previous history of head injury, dementia or psychiatric illness and (5) have no other concurrent cancer. All men who met inclusion criteria completed informed consent. In all, 131 men were referred to the project over a 20 month time period. Of these men, 12 were ineligible for the study. Six men were excluded on the basis of a previous history of anxiety or depression for which they were currently receiving psychiatric care including psychotropic medication. Two men had a recent history of head injury; one man was Korean and was unable to speak or read English; one man had a concurrent second primary cancer of the bladder; one man was geographically inaccessible; and finally one man was over twelve months post-diagnosis and so was not newly diagnosed. Of a potential sample of 119 men, seven declined to participate and one man failed to return the first assessment. Thus, a total of 111 men were recruited to the project (93% response). Of these, 104 men completed the final twelve month assessment.

The mean age of participants was 61.54 years (SD=8.13) and 89% of men were married. At recruitment to the study, participants' mean time since diagnosis was 4.25 weeks (SD=4.55) and 49% of men had not yet made a decision about their medical treatment choice. Men in the study were all Anglo European, with English the first language for 97% of participants, and two Italian speaking men and one German speaking man in the study. Of the remainder, two participants spoke Italian at home and one man spoke German. For the highest level of educational attainment, 15% of men had primary school education, 38% had completed junior high school (year 10), 13.5% had completed senior high school (year 12),

20% had attended vocational training and 13.5% had completed university studies. Of all participants 58% were currently retired, 15% were managers or professionals, and 27% were employed as tradespersons, clerical positions, production or transport, or labourers. Finally, 56% of men subsequently underwent radical prostatectomy, 26% chose watchful waiting and 18% underwent radiation therapy.

Procedure and Materials

The first assessment occurred after diagnosis but before treatment, with subsequent assessments two and twelve months after treatment or the decision to watchful wait. At the first assessment a short interview was conducted to assess socio-demographic variables. Following this a series of self report measures were administered, and these were repeated at subsequent assessments. These measures assessed: dispositional optimism, cancer threat appraisal, support and information seeking and cognitive avoidance, decision-related distress. Domain specific quality of life was also assessed.

Self Report Measures

Optimism. Dispositional optimism was defined as generalised outcome expectancies where optimistic people have positive expectancies and pessimistic people have negative expectancies. (Scheier & Carver, 1985; Scheier & Carver, 1992) Accordingly, optimism was measured by the Revised Life Orientation Test (RLOT; (Scheier, Carver, & Bridges, 1994)a 10 item scale consisting of 6 target items and four filler items. Items are scored on a five point response scale where participants are asked to indicate their extent of agreement from 0 (*strongly disagree*) to 4 (*strongly agree*). Filler items are not used in scoring. An example of a target item is "In uncertain times I usually expect the best". Negatively worded target items are reverse scored with responses to target items summed to compute an overall optimism score so that a higher score indicates greater dispositional optimism. In the present study internal consistency for the RLOT was good (α =.80, .79, .79).

Cancer Threat Appraisal. Men's cancer threat appraisal was assessed using the Constructed Meaning Scale (CMS;. (Fife, 1995) The CMS measures a person's cognitive assessment of the implications of their cancer diagnosis on their sense of identity, interpersonal relationships, and what the future holds. This scale includes eight items with participants asked to indicate their level of agreement with each item over the last week on a four point response scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Examples of items are "I feel cancer has changed my life permanently so it will never be as good again" (identity); "I feel that my relationships with other people have not been negatively affected by my illness" (interpersonal relationships); "I feel cancer is something I will never recover from" (what the future holds). Negatively worded items are reverse scored with responses summed to give an overall score where a lower score indicates a more negative cognitive appraisal. The measure has good internal consistency (α =.81) and in the present study was satisfactory (α =.76, .79, .79).

Positive appraisals of the meaning of the cancer diagnosis as assessed by the CMS are associated with positive focusing and negative appraisals are associated with avoidant coping. (Fife, 1995) As well, positive appraisals are predictive of greater personal control, a more positive body image and better psychological adjustment.

Support and information seeking and cognitive avoidance. Support and information seeking and cognitive avoidance coping were measured using the *Seek and Use Social Support* (WOC-SS) and *Cognitive Escape-Avoidance* (WOC-CEA) subscales of the Ways of Coping – Cancer Version. (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992) The WOC-SS has 11 items that describe help seeking behaviours such as "Tried to get professional help" and "Talked to someone to find out more". The WOC-CEA has nine items that describe cognitive avoiding strategies such as "Wished the situation would go away or be over" and "Went along with fate". Participants are asked to indicate how often they have used each

coping strategy over the last week using a four point response scale ranging from 1 (*not used*) to 4 (*used a great deal*). Higher scores indicate greater use of coping strategies. These subscales have established validity with both the general community and cancer patients (WOC-SS, α =.86; WOC-CEA; α =.78). In the present study internal consistencies for both subscales were good at all assessments (WOC-SS: α =.83, .88, .90; WOC-CEA: α =.67, .74, .80).

For cancer patients, support and information seeking has been found to be related to participation in support groups and less emotional distress while cognitive avoidance is related to greater emotional distress. (Dunkel-Schetter et al., 1992) As well, patients' ratings of the perceived stressfulness of their problems are related to both support and information seeking and cognitive avoidance.

Decision-Related Distress. Decision-related distress was assessed with the Decisional Conflict Scale (DCS;. (O'Connor, 1995) The DCS measures a person's perception of the difficulty involved in making a decision about medical treatments. This scale has 16 items covering decisional uncertainty, feeling uninformed, unclear about personal values, and unsupported in decision making, and perceptions of effective decision making. The items assessing perceptions of effective decision making are administered after the treatment decision has been made. Participants are asked to indicate their extent of agreement with each item on a five point response scale of 1 (strongly agree) to 5 (strongly disagree). Negatively worded items are reverse scored with higher scores indicating greater decision-related distress. Examples of items include "My decision shows what is most important for me" and "The decision about my treatment is hard to make".

The DCS has been validated in a range of population groups and is sensitive to people making different health decisions and to the effect of decision aids with internal consistency for the total scale ranging from α =.78 to 0.89. (Davison, Kirk, Degner, & Hassard, 1999;

Dolan & Frisina, 2002; Gattellari & Ward, 2003; Goel, Sawka, Thiel, Gort, & O'Connor, 2001; O'Connor et al., 1997; O'Connor, Pennie, & Dales, 1996; O'Connor et al., 1998) Health decisions assessed with this scale include immunisation, cancer screening, prenatal testing, hormone replacement therapy and medical treatments for lung and breast cancer, heart disease and atrial fibrillation.

For the present study four items of the DCS were revised to be specific to prostate cancer. With regards to items about perceptions of effective decision making, we deleted the item "I expect to stick with my decision" as once treatment is undertaken the decision is irreversible, making this item redundant. We also deleted three items assessing clarity about personal values on the basis that the elicitation of personal preferences in decisional assessment can potentially influence patients' decision making strategies. (Slovic, 1995) We added an additional item about prostate cancer treatment information being confusing to supplement the items on feeling informed. As well, three items relevant to the current clinical uncertainty about localized prostate cancer treatments were included that were derived from patient interviews. Examples of these items are "Compared to other cancers, not enough is known about prostate cancer" and "There is still a lot doctors don't know about prostate cancer". Finally, where relevant, generic items were reworded to refer specifically to prostate cancer treatments as the target decision.

A number of steps were taken to check the validity and reliability of the revised DCS. As the three items measuring *perceived effective decision making* are administered only at Time 2 and 3, these items were analysed as a separate subscale. An exploratory simple factor analysis of these items revealed a one factor solution accounting for 72% of the variance with good internal consistency (factor loadings ranged from .66 to .80; eigenvalue = 2.16).

Factor analyses were then undertaken for the remaining 13 items at Time 1. First, an exploratory factor analysis was performed that identified three factors with eigenvalues

greater than 1 accounting for 59% of the variance. Visual inspection of the scree plot suggested a two or three factor solution. The minimum average partial test was then used and this confirmed that a two factor structure existed in the correlation matrix. (O'Connor, 2000; Velicer, 1976)

Accordingly, a principal components factor analysis with a Varimax rotation was performed. (Tabachnik & Fidell, 1996) Two clearly interpretable factors were identified accounting for 49% of the variance: a factor with nine items describing *decisional uncertainty* that included being uncertain about the decision and treatment side effects and satisfaction with informational support; and a second factor about *uncertainty about prostate cancer* (see Table 1). One item failed to load onto either of the two identified factors above 0.32 and following common practice was not included in further analyses. (Tabachnik & Fidell, 1996) The remaining 12 items were retained for future analyses along with the *perceived effective decision making* items. As is the usual practice with this scale, total decisional conflict scores were calculated as the mean value of all items summed. The revised scale demonstrated good internal consistency (α=.84 at each time point).

Consistent with the predictions of, (O'Connor, 1995) *uncertainty about prostate cancer* as a factor contributing to uncertainty was significantly correlated to *decisional uncertainty* (r=.37 to .24; p<.05). Further, as expected *decisional uncertainty* was significantly correlated to *perceived effective decision making* (r=.61 to .68, p<.0001). Finally, the revised scale demonstrated good criterion validity with men who had already made a treatment decision reporting significantly less decision-related distress on the DCS compared to men who were undecided. (Steginga, Occhipinti, Gardiner, Yaxley, & Heathcote, 2004)

Domain specific quality of life. Urinary, sexual and bowel problems associated with prostate cancer treatments were measured by the UCLA Prostate Cancer Index. (Litwin et al., 1998) This 20 item measure includes single item global bother subscales and multiple item

symptom subscales for each of the three problem domains of urinary, sexual and bowel functioning. The symptom subscales that were used for the present study ask men to indicate how often they have experienced various domain specific symptoms. Higher scores indicate fewer symptoms. In the present study internal consistencies for these subscales were acceptable at each assessment (bowel α=.72, .70, .79; sexual α=.93, .95, .92; urinary α=.59, .90, .85).

Results

Preliminary analyses

Dispositional optimism did not different on the basis of treatment choice (p=.11). Preliminary analyses found no evidence of multi-collinearity between decisional-related distress and predictor variables, with low to moderate correlations at each assessment point (r=.13 to .47). In a check for potential background covariates we found no significant relationships between decision-related distress and age and education. However, there was significant correlation between time since diagnosis and decision-related distress at Time 1 only, with men who were closer to diagnosis reporting more decision-related distress (r=-.20, p=.04). As well, we conducted correlation analyses for treatment side effects and decision-related distress at the Time 2 and 3 assessments. At Time 2 urinary and sexual symptoms were positively correlated with decision-related distress (r=.25 and .20; p's<.05). No other significant correlations were observed between physical effects and decision-related distress. Finally, decision-related distress at diagnosis was significantly correlated to decision-related distress at the Time 2 and 3 assessments (r= .62 and .56; p's<.001).

Prediction of decision-related distress

Accordingly, we tested a model where dispositional optimism, threat appraisal, support and information seeking and cognitive avoidance were hypothesized to be predictors of decision-related distress. Data was analysed using hierarchical multiple linear regressions utilising a priori approach in which predictor variables were entered in blocks specified by the researcher according to logical or theoretical considerations. (Tabachnik & Fidell, 1996) Thus, independent variables that are presumed to have substantive priority were entered first. Decision-related distress was the criterion variable. Tests for mediation were undertaken following procedures recommended by (Holmbeck, 1997)and. (Baron & Kenny, 1986) On the basis of the preliminary analyses, for predictions concerning decision-related distress at

Time 1, time since diagnosis was entered as a co-variate. For predictions concerning decision-related distress at Time 2, concurrent urinary and sexual symptoms were included in the model.

Descriptive data for psychological, decision-related and physical adjustment outcomes are described elsewhere. (Steginga et al., 2004) Men who chose different treatment options did not differ with regards to decision-related distress at any time point.

Baseline decision-related distress

In the first analysis with baseline decision-related distress as the criterion variable, time since diagnosis was first entered as a co-variate. This was significant ($F(1,104) = 4.05$, p=.05) accounting for 4% of the variance. Next, the individual difference variable of optimism was entered in a single block. This step was also significant ($F(1,103) = 11.19$, p=.001) with the model now accounting for 13% of the variance. Threat appraisal was then added in a third block. This step was also significant ($F(1,102) = 11.20$, p=.001) with the model now accounting for 22% of the variance. However, optimism was now no longer a significant predictor (p=.130). In the fourth block, seeking support and information and cognitive avoidance were entered. This step was not significant adding only 2% of variance to the total model ($F(2,100) = 1.40$, p=.25; see Table 2).

A further regression analysis was then undertaken to confirm whether threat appraisal mediated the relationship between optimism and decision-related distress. In this procedure optimism was entered as the predictor variable and threat appraisal was the criterion variable. Optimism was a significant predictor of threat appraisal ($F(1,108) = 26.51$; p<.001) accounting for 20% of the variance. Thus, lower optimism and a more negative threat appraisal were predictive of higher decision-related distress with the effect of optimism mediated by threat appraisal.

Decision-related distress two months after treatment

In this analysis Time 2 decision-related distress was the criterion variable. As in previous research, baseline distress was included in the model to ensure that any effects found for optimism and threat appraisal were attributable to optimism and threat appraisal per se, and not to the association between these variables and baseline distress (Carver et al., 1993; Scheier et al., 1989). Accordingly, Time 1 decision-related distress was entered in the first block. This was significant ($F(1,100) = 63.76$; $p<.001$) accounting for 39% of the variance. In the second block urinary and sexual symptoms at Time 2 were entered. This was non-significant ($F(2,98) = 1.47$; $p=.24$) adding only 2% of variance to the model. In the third block baseline optimism was entered and this was significant ($F(1,97) = 5.36$; $p=.02$) with the model now accounting for 44% of the variance. In the fourth block baseline threat appraisal was entered into the model and this was not significant ($F(1,96) = .15$; $p=.70$). In the final block baseline seeking support and information and cognitive avoidance were entered and this was also not significant ($F(2,94) = 1.27$; $p=.29$). In the final model only baseline decision-related distress and optimism were predictive of Time 2 decision-related distress with the model accounting for 45% of the variance (see Table 3).

A second regression was then carried out to assess whether concurrent threat appraisal, seeking support and information and cognitive avoidance predicted Time 2 decision-related distress. In the first step baseline decision-related distress was entered in a single block. This was significant ($F(2,102) = 69.51$; $p<.001$) accounting for 40% of the variance. Next, urinary and sexual symptoms at Time 2 were entered in a single block and this was not significant ($F(2,100) = 1.56$; $p=.21$) adding 2% to the variance. In the next block baseline optimism was entered. This was also significant ($F(1,99) = 5.00$; $p=.03$) with the model now accounting for 45% of the variance. In the fourth block concurrent threat appraisal was entered; this step was also significant ($F(1,98) = 26.85$; $p<.001$) with the model

now accounting for 57% of the variance and optimism now no longer significant (p=.27). In the final block concurrent seeking support and information and cognitive avoidance were entered, with this step not significant (F(2,96) = 1.66; p=.20). In the final model baseline decision-related distress, Time 2 urinary symptoms and threat appraisal were significant predictors of Time 2 decision-related distress with this model accounting for 58% of the variance (see Table 4).

A further regression analysis was then undertaken to confirm whether threat appraisal at Time 2 mediated the relationship between baseline optimism and Time 2 decision-related distress. In this procedure baseline optimism was entered as the predictor variable and Time 2 threat appraisal was the criterion variable. Optimism was a significant predictor of threat appraisal (F(1,106) = 11.84; p=.001) accounting for 10% of the variance. Thus, lower baseline optimism and a more negative threat appraisal at Time 2 were predictive of higher decision-related distress at Time 2, with the effect of optimism mediated by threat appraisal.

Decision-related distress twelve months after treatment

In the next analyses Time 3 decision-related distress was the criterion variable. As previously, baseline decision-related distress was entered in the first block. This was significant (F(1,97) = 44.15; p<.001) accounting for 31% of the variance. In the next block Time 1 optimism was entered and this was not significant (F(1,96) = 1.38; p=.24) adding only 1% of variance to the model. Time 1 threat appraisal was then entered and this step was not significant (F(1,95) = .13; p=.72) adding no variance to the model. Finally, Time 1 seeking support and information and cognitive avoidance were entered and this block was also not significant (F(2,93) = .70; p=.50). In the final model only baseline decision-related distress was predictive of Time 3 decision-related distress with this model accounting for 33% of the variance (see Table 5).

The next analysis assessed concurrent prediction of Time 3 decision-related distress. To again control for prior decision related distress, baseline decision-related distress was entered in the first block. This was significant $(F(1,99) = 48.72; p<.001)$ accounting for 33% of the variance. As baseline optimism was not a significant predictor of Time 3 decision-related distress in the previous analysis, we entered Time 3 optimism in the second block to assess for any effects of concurrent optimism. This was significant $(F(1,98) = 5.63x; p=.02)$ adding 4% of variance to the model. In the third block Time 3 threat appraisal was entered into the model and this was also significant $(F(1,97) = 14.39; p<.001)$ adding a further 8% of variance to the model, with optimism now no longer significant $(p= .22)$. In the final block Time 3 seeking support and information and cognitive avoidance were entered and this was not significant $(F(2,95) = 1.47; p=.23)$. In the final model Time 3 decision-related distress was predicted by baseline decision-related distress and Time 3 threat appraisal with this model accounting for 47% of the variance (see Table 6).

A final regression analysis was then undertaken to confirm whether cognitive appraisal at Time 3 mediated the relationship between Time 3 optimism and Time 3 decision-related distress. In this procedure Time 3 optimism was entered as the predictor variable and Time 3 threat appraisal was the criterion variable. Optimism was a significant predictor of threat appraisal $(F(1,100) = 12.04; p=.001)$ accounting for 11% of the variance. Thus, lower optimism and a more negative cognitive appraisal at Time 3 were predictive of higher decisional conflict at Time 3, with the effect of optimism fully mediated by threat appraisal.

Discussion

Our hypotheses that optimism and cancer threat appraisal would predict decision-related distress were confirmed: decision-related distress at diagnosis and at twelve months concurrently, and at two months prospectively, was predicted by optimism; and this effect was mediated by the man's proximal threat appraisal of the impact of the cancer on his current life. No effects were found for seeking support and information and cognitive avoidance. With regard to the physical side effects of treatment, concurrent urinary symptoms were related to decision–related distress two months after treatment, with no other effects observed. From this it appears that optimism and threat appraisal play a stronger role in decision-related distress than do physical treatment side effects and the coping behaviours of support and information seeking and avoidant coping. This confirms the theoretical proposition that a person's outcome expectancies (i.e., dispositional optimism) leads them to expect either positive or negative outcomes from their cancer diagnosis. These expectancies influence how the man appraises the threat of the cancer, and this in turn influences the man's distress response to the treatment decision. To our knowledge this study is the first to assess the relationship between optimism and decision-related distress, thus adding to the literature supporting the importance of dispositional optimism as a factor influencing individuals' responses to the stressors of illness.

However, these findings also have practical implications for the delivery and design of decisional support interventions. Currently, clinical practice guidelines for the psychological care of adults with cancer recommend early identification of patients with high levels of psychological distress and triaging of these patients to in-depth intervention programs (National Breast Cancer Centre, National Cancer Control Initiative, & National Health and Medical Research Council, 2003; National Comprehensive Cancer Network, 2004). The finding that decision-related distress at baseline predicts longer term distress,

suggests that such screening should be extended to include assessment of decision-related distress in patient groups facing complex treatment decisions. This could be achieved using the Decisional Conflict Scale, a measure that is brief and easy to administer, and has low literacy pictorial and other language versions available (O'Connor, 1995).

As well, these results indicate the need for review of current approaches to decision support. Specifically, decision support currently focuses on the need for interventions to be evidence-based with regards to medical content; to include strategies that assist people to be as involved in the decision making process as they prefer; and to make deliberative and specific choices that are consistent with their personal values. (O'Connor et al., 2001; Stacey et al., 2001) Such decisional support interventions have been shown to improve patients' knowledge, decrease their decision-related distress, and lead to greater participation by patients in their treatment decisions. (O'Connor et al., 1999) However, some studies utilising randomised control designs have yielded inconsistent findings. (Goel et al., 2001; Man-Son-Hing et al., 1999) The finding that a more negative threat appraisal is related to greater decision-related distress suggests that outcome expectations may present as a target to improve the effectiveness of decision support.

For example, psychosocial interventions that include social cognitive components, such as self efficacy, outcome expectations, and self regulation, are effective in improving quality of life outcomes for cancer patients. (Graves, 2003) Outcome expectations refer to a person's perceptions of their current and potential future outcomes, both physical and psychosocial, that may result from a behaviour or action. This includes a person's expectations of the outcomes of cancer treatments. Further, as these expectations are subjective, they can be unrealistic in as far as being overly negative or positive. On the basis of the present study, a patient who thinks that the threat of cancer is insurmountable may consequent to this find treatment decision making overwhelming. Therefore, decisional

support interventions that target outcome expectations with regard to overly negative appraisals of the cancer diagnosis and the consequent treatment decision *in addition to* current best-practice decision support may prove more powerful.

In this regard, (Nezu, Nezu, Friedman, Faddis, & Houts, 1998) have suggested that for cancer patients, the subjective appraisal of a problem underpins their responses. In particular, catastrophizing or magnifying the problem may hinder rational problem solving. Thus, the addition of a therapy component to address problem orientation with regard to the threat that cancer and its treatment poses would be expected to enhance decision support interventions that are utility based. This approach to decision support could be undertaken using a multi-component model of supportive care combining stress management, patient education, and conventional decision support closely paired with problem solving skills and the challenging of negative cancer threat appraisals. In this regard, one of the current authors (SS) is currently a lead investigator in a large scale randomised control intervention trial with men newly diagnosed with localized prostate cancer being undertaken by the Queensland Cancer Fund. The multi-component intervention will be delivered remotely with telephone counsellors using supplementary printed materials. This method would then potentially be able to be delivered by a range of providers including acute treatment centres such as urology outpatient clinics as well as heath or cancer helplines.

It is not clear why seeking support and information and cognitive avoidance were not associated with decision-related distress. It may be that decision-related distress is a cognitive phenomenon that is primarily affected by appraisal processes, rather than coping efforts. Alternatively, problem solving coping where the individual actually uses the information they have obtained to manage the challenges of the cancer may be of more importance. This is an important question for future research since it underpins the selection of therapy components.

Limitations

The choice of men with localized prostate cancer for this study was deliberate. Based on the current uncertainty in the medical context of this disease, it was expected that decisional uncertainty would be highly salient for these men, making this an ideal population for this research question. However, people may respond differently in uncertain treatment decisions where threat is high, as in a cancer treatment decision, by comparison to other health contexts. Thus, cross-validation of the present findings in other patient groups where uncertainty is less heightened and in non-cancer treatment decisions is needed. As well, the sample did not include men from an Asian or indigenous background, reflecting the local patient population group from which the study drew. Men from different cultural backgrounds that have different lay beliefs about cancer and their health care may respond differently in this health decision context. Thus, research using a more ethnically diverse population is needed.

Finally, one might speculate that actual knowledge about treatment options might affect decision-related distress. However, there is large amount of variability in the information men consider essential to make this treatment decision, from nine to 58 different content items, with no core set yet identified. (Feldman-Stewart, Brundage, Nickel, & Mackillop, 2001) Thus, assessing knowledge using a standard set of items may not be meaningful for this patient group.

Conclusion

The present results further confirm the important role that dispositional optimism plays in the adjustment process and extend previous research by applying this model to the prediction of decision-related distress. Specifically, men who were more optimistic experienced less decision-related distress. Further, more optimistic men appraised the threat of their cancer less negatively, and this was in turn related to lower decision-related distress.

From these findings it is proposed firstly that centres who provide care for this patient group consider routine screening for decision-related distress. Second, future research on decisional support interventions should consider broadening their approach to include outcome expectations as a therapy target.

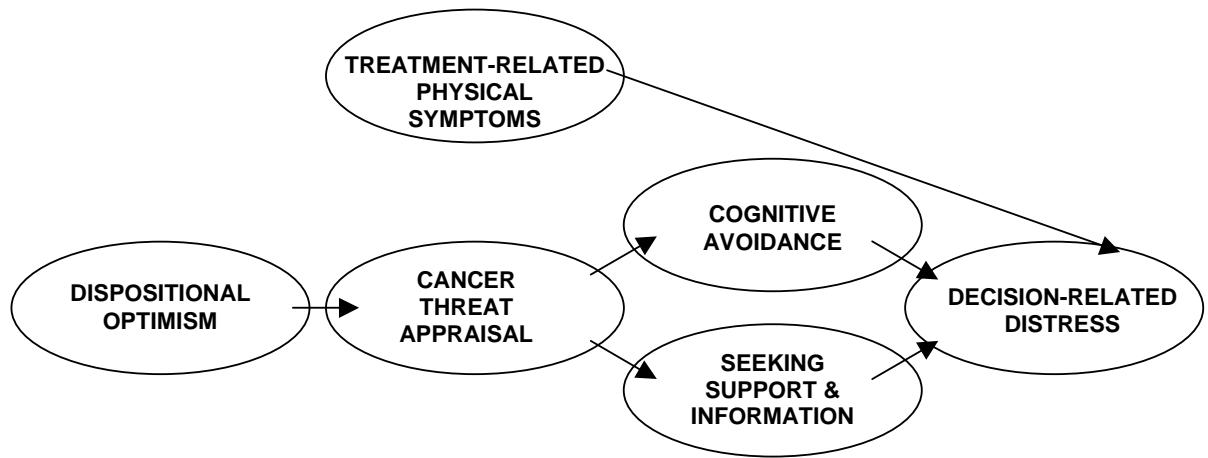Figure 1. Conceptual Model for Prediction of Decision-Related Distress

Table 1

Factor Analysis of the remaining items of the Revised Decisional Conflict Scale

Items	Component	
	1	2
Decisional Uncertainty		
I am sure about what to do in this decision	.800	.248
It's clear what choice is best for me	.761	.159
The decision about my treatment is hard to make	.632	.367
I am making this choice without any pressure from others	.571	
I have the right amount of support from others in making this choice	.698	
The information I have received about prostate cancer treatments is confusing	.657	.408
I have enough advice about the different treatments for prostate cancer	.765	
I feel I understand the pros and cons of the different prostate cancer treatments	.738	-.266
It is difficult to weigh up the pros and cons of treatment for prostate cancer	.589	.379
Uncertainty about prostate cancer		
I feel there is a lot of uncertainty about the effects of prostate cancer treatments	.168	.519
There is still a lot doctors don't know about prostate cancer		.697
Compared to other cancers, not enough is known about prostate cancer		.712
A lot of progress has been made in the treatment of prostate cancer		.233
Eigenvalue	4.74	1.63
Variance	36.4%	12.5%

Table 2

Multiple Hierarchical Regression Results for Decision-Related Distress at Baseline

Variable	Standardized β co-efficient	r	semipartial correlation	p
Weeks since diagnosis	-.110	-.193	-.107	.221
Optimism	-.185	-.333	-.159	.072
Threat appraisal	-.346*	-.424	-.292	.001
Seeking support and information	.152	.165	.135	.124
Cognitive avoidance	-.124	.131	-.135	.235

R= .49

R^2=.24**

Note. *= p<.01, **= p<.001.

Table 3

Multiple Hierarchical Regression Results for Prospective Prediction of Decision-Related

Distress at the Second Assessment by Baseline Optimism and Psychological Variables

Variables	Standardized β co-efficient	r	semipartial correlation	p
Decision Related Distress (T1)	.513**	.624	.437	<.001
Urinary symptoms	.070	.261	.055	.475
Sexual symptoms	.085	.204	.068	.372
Optimism (T1)	-.226*	-.358	-.189	.015
Threat appraisal (T1)	.017	-.312	.013	.864
Seeking support and information (T1)	.131	.223	.117	.129
Cognitive avoidance (T1)	-.095	.071	-.078	.306

R= .67

R^2=.45**

Note. *= p<.05, **= p<.001.

Table 4

Multiple Hierarchical Regression Results for Prediction of Decision-Related Distress at the

Second Assessment by Baseline Optimism and Concurrent Psychological Variables

Variables	Standardized β co-efficient	r	semipartial correlation	p
Decision Related Distress (T1)	.484**	.637	.434	<.001
Urinary bother	.188*	.260	.148	.027
Sexual bother	.078	.203	.064	.337
Optimism (T1)	-.070	-.357	-.063	.340
Threat appraisal	-.332**	-.473	-.286	<.001
Seeking support and information	.057	.128	.048	.464
Cognitive avoidance	.093	.229	.073	.273

R= .76

R^2=.58**

Note. *= p<.05, **= p<.001.

Table 5

Multiple Hierarchical Regression Results for Prediction of Decision-Related Distress at the

Third Assessment by Baseline Optimism and Psychological Variables

Variables	Standardized β co-efficient	r	semipartial correlation	p
Decision-Related Distress (T1)	.515*	.559	.463	<.001
Optimism	-.081	-.256	-.069	.417
Threat appraisal	-.014	-.2281	-.011	.894
Seeking support and information	.067	.170	.056	.507
Cognitive avoidance	.057	.167	.051	.549

R= .58

R^2=.33*

Note. *= p<.001.

Table 6

Multiple Hierarchical Regression Results for Prediction of Decision-Related Distress at the

Third Assessment by Concurrent Psychological Variables

Variables	Standardized β co-efficient	r	semipartial correlation	p
Decision-Related Distress (T1)	.498**	.574	.467	<.001
Optimism	-.086	-.341	-.072	.338
Threat appraisal	-.280*	-.412	-.258	.001
Seeking support and information	.045	.189	.032	.668
Cognitive avoidance	.100	.258	.069	.360

R= .68

R^2=.47**

Note. *= p<.01; **= p<.001.

References

Abbas, F., & Scardino, P. T. (1997). The natural history of clinical prostate carcinoma. *Cancer, 80*(5), 827-833.

Australian Cancer Network Working Party on Management of Localised Prostate Cancer. (2002). *Clinical Practice Guidelines: Evidence-based information and recommendations for the management of localised prostate cancer*. Canberra: National Health and Medical Research Council.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Barry, M. J. (1999). Involving patients in medical decisions: How can physicians do better? *Journal of the American Medical Association, 282*(24), 2356-2357.

Bjorck, J. P., Hopp, D. P., & Jones, L. W. (1999). Prostate cancer and emotional functioning: Effects of mental adjustment, optimism and appraisal. *Journal of Psychosocial Oncology, 17*(1), 71-85.

Carvalhal, G. F., Smith, D. S., Ramos, C., Krygiel, J., Mager, D. E., Yan, Y., & Catalona, W. J. (1999). Correlates of dissatisfaction with treatment in patients with prostate cancer diagnosed through screening. *The Journal of Urology, 162*(1), 113-118.

Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, F. L., & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *Journal of Personality and Social Psychology, 65*(2), 375-390.

Davison, B. J., Kirk, P., Degner, L. F., & Hassard, T. H. (1999). Information and patient participation in screening for prostate cancer. *Patient Education and Counseling, 37*, 255-263.

Dolan, J. G., & Frisina, S. (2002). Randomized controlled trial of a patient decision aid for colorectal cancer screening. *Medical Decision Making, 22*, 125-139.

Dunkel-Schetter, C., Feinstein, L. G., Taylor, S. E., & Falke, R. L. (1992). Patterns of coping with cancer. *Health Psychology, 11*(2), 79-87.

Edwards, A., & Elwyn, G. (1999). The potential benefits of decision aids in clinical medicine. *Journal of the American Medical Association, 282*(8), 779-780.

Epping-Jordan, J., Compas, B. E., & Howell, D. C. (1994). Predictors of cancer progression in young adult men and women: Avoidance, intrusive thoughts, and psychological symptoms. *Health Psychology, 13*(6), 539-547.

Fallowfield, L., Ford, S., & Lewis, S. (1995). No news is not good news: Information preferences of patients with cancer. *Psycho-oncology, 4*, 197-202.

Feldman-Stewart, D., Brundage, M. D., Nickel, J. C., & Mackillop, W. J. (2001). The information required by patients with early stage prostate cancer in choosing their treatment. *British Journal of Urology International, 87*, 218-223.

Fiedler, K. (1988). Emotional mood, cognitive style, and behavioral regulation. In k. Fiedler & J. Forgas (Eds.), *Affect, Cognition and Social Behavior* (pp. 100-119). Toronto: Hogrefe Int.

Fife, B. L. (1995). The measurement of meaning in illness. *Social science and medicine, 40*(8), 1021-1028.

Folkman, S., & Greer, S. (2000). Promoting psychological well-being in the face of serious illness: When theory, research and practice inform each other. *Psycho-Oncology, 9*, 11-19.

Frosch, D. L., & Kaplan, R. M. (1999). Shared decision making in clinical medicine: Past research and future directions. *American journal of Preventative Medicine, 17*(4), 285-294.

Gattellari, M., & Ward, J. E. (2003). Does evidence-based information about screening for prostate cancer enhance consumer decision making? A randomised controlled trial. *Journal of Medical Screening, 10*, 27-39.

Goel, V., Sawka, C. A., Thiel, E. C., Gort, E. H., & O'Connor, A. M. (2001). Randomized trial of a patient decision making aid for choice of surgical treatment for breast cancer. *Medical Decision Making, 21*, 1-6.

Graves, K. D. (2003). Social cognitive theory and cancer patients' quality of life: A meta-analysis of psychosocial intervention components. *Health Psychology, 22*(2), 210-219.

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*(4), 599-610.

Litwin, M. S., Hays, R. D., Fink, A., Ganz, P. A., Leake, B., & Brook, R. H. (1998). The UCLA Prostate Cancer Index. *Medical Care, 36*(7), 1002-1012.

Llewellyn-Thomas, H. A. (1995). Patients' health care decision making. *Medical Decision Making, 15*(2), 101-106.

Luce, M. F., Bettman, J. R., & Payne, J. W. (1997). Choice processing in emotionally difficult decisions. *Journal of Experimental Psychology, 23*(2), 384-405.

Man-Son-Hing, M., Laupacis, A., O'Connor, A., Biggs, J., Drake, E., Yetisir, E., & Hart, R. G. (1999). A patient decision aid regarding antithrombotic therapy for stroke prevention in atrial fibrillation. *Journal of the American Medical Association, 282*(8), 737-743.

Massie, M. J., & Holland, J. C. (1990). Overview of normal reactions and prevalence of psychiatric disorders. In J. C. Holland & J. H. Rowland (Eds.), *Handbook of*

Psychooncology: Psychological Care of the Patient with Cancer (pp. 273-282). New York: Oxford University Press.

McVea, K. L. S. P., Minier, W. C., & Johnson Palensky, J. E. (2001). Low-income women with early stage breast cancer: Physician and patient decision making styles. *Psycho-Oncology, 10*, 137-146.

Molenaar, S., Sprangers, M. A. G., Postma-Shuit, F. C. E., Hendriks, J., & De Haes, H. (2000). Feasibility and effects of decision aids. *Medical Decision Making, 20*(1), 112-127.

National Breast Cancer Centre, National Cancer Control Initiative, & National Health and Medical Research Council. (2003). *Clinical Practice Guidelines for the Psychosocial Care of Adults with Cancer*. Sydney: National Breast Cancer Centre.

National Comprehensive Cancer Network. (2004). *Clincal Practice Guidelines in Oncology: Distress Mananagement Version - v.1.2004*.: National Comprehensive Cancer Network Inc.

Nezu, A. M., Nezu, C. M., Friedman, S. H., Faddis, S., & Houts, P. S. (1998). *A problem-solving approach helping cancer patients cope*. Washington: American Psychological Association.

O'Connor, A. M. (1995). Validation of a decisional conflict scale. *Medical Decision Making, 15*, 25-30.

O'Connor, A. M., Llewellyn-Thomas, H. A., Sawka, C., Pinfold, S. P., To, T., & Harison, D. E. (1997). Physicians' opinions about decision aids for patients considering systematic adjuvant therapy for axillary node negative breast cancer. *Patient Education and Counseling, 30*, 143-153.

O'Connor, A. M., Pennie, R. A., & Dales, R. E. (1996). Framing effects on expectations, decisions, and side effects experienced: The case of influenza immunization. *Journal of Clinical Epidemiology, 49*(11), 1271-1276.

O'Connor, A. M., Rostom, A., Fiset, V., Tetroe, J., Entwistle, V., Llewellyn-Thomas, H., Holmes-Rovner, M., Barry, M., & Jones, J. (1999). Decision aids for patients facing health treatment or screening decisions: systematic review. *British Medical Journal, 319*, 731-734.

O'Connor, A. M., Stacey, D., Rovner, D., Holmes-Rovner, M., Tetroe, J., Llewellyn-Thomas, H., Entwistle, V., Barry, M., Rostom, A., Fiset, V., Barry, M., & Jones, J. (2001). *Decision aids for people facing health treatment or screening decisions (Cochrane Review)* (Vol. Issue 3): Oxford: Update Software.

O'Connor, A. M., Tugwell, P., Wells, G. A., Elmslie, T., Jolly, E., Hollingworth, G., McPherson, R., Drake, E., Hopman, W., & MacKenzie, T. (1998). Randomized trial of a portable, self-administered decision aid for postmenopausal women considering long-term preventive hormone therapy. *Medical Decision Making, 18*, 295-303.

O'Connor, B. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, and Computers, 32*(3), 396-402.

Penedo, F. J., Dahn, J. R., Gonzalez, J. S., Molton, I., Carver, C. S., Antoni, M. H., & Roos, B. A. (2003). Perceived stress management skill mediates the relationship bewteen optimism and positive mood following radical prostatectomy. *Health Psychology, 22*, 220-222.

Potosky, A. L., Legler, J. L., Albertsen, P. C., Stanford, J. L., Gilliland, A. S., Hamilton, J., Eley, W., Stephenson, R. A., & Harlan, L. C. (2000). Health outcomes after

prostatectomy or radiotherapy for prostate cancer: Results from the prostate cancer outcomes study. *Journal of the National Cancer Institute, 92*(19), 1582-1592.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*(3), 219-247.

Scheier, M. F., & Carver, C. S. (1992). Effects of optimism on psychological and physical well-being: theoretical overview and empirical update. *Cognitive Therapy and Research, 16*(2), 201-228.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self mastery, and self esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*(6), 1063-1078.

Scheier, M. F., Mathews, K. A., Owens, J. F., Magovern, G. J., Lefebvre, R. C., Abbott, R. A., & Carver, C. S. (1989). Dispositional optimism and recovery from coronary artery bypass surgery: The beneficial effects on physical and psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1024-1040.

Schmid, H. P., McNeal, J. E., & Stamey, T. A. (1993). Observations on the doubling time of prostate cancer. The use of serial prostate specific antigen in patients with untreated disease as a measure of increasing cancer volume. *Cancer, 71*(6), 2031-2040.

Schnoll, R. A., Knowles, J. C., & Harlow, L. (2002). Correlates of adjustment among cancer survivors. *Journal of Psychosocial Oncology, 20*(1), 37-59.

Slovic, P. (1995). The construction of preference. *American Psychologist, 50*(5), 364-371.

Spencer, S. M., Carver, C. S., & Price, A. A. (1998). Psycholgical and social factors in adaptation. In J. Holland (Ed.), *Psycho-oncology* (pp. 211-222). New York: Oxford University Press.

Stacey, D., O'Connor, A. M., Rovner, D., Holmes-Rovner, M., Tetroe, J., Llewellyn-Thomas, H., Entwistle, V., & Barry, M. (2001). Decision aids for people facing health treatment or screening decisions (Cochrane Review). *Medical Decision Making, 21*(6), 527.

Stanton, A. L., & Snider, P. R. (1993). Coping with a breast cancer diagnosis: A prospective study. *Health Psychology, 12*(1), 16-23.

Steginga, S. K., Occhipinti, S., Gardiner, R. A., Yaxley, J., & Heathcote, P. (2004). A Prospective Study of Men's Psychological and Decision-Related Adjustment after Treatment for Localized Prostate Cancer. *Urology, 63*, 751-756.

Tabachnik, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics* (Third ed.). Northbridge: HarperCollins College.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*, 321-327.