



Impact of Optimism and Pessimism on Distress among Newly Diagnosed Prostate Cancer Patients

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Abstract - English

Prostate cancer (PCA), the most common cancer among men in the Western world, can be a major life stressor and heightened levels of psychological distress are common. However, there is a wide variability in distress with some PCA patients reporting little distress. The main aim of the present study was to examine both protective and risk factors for distress after the diagnoses of PCA as such information might be important to identify those that are at risk for impaired quality of life and for the design of interventions. Towards this goal the relationship between optimism, pessimism and distress was examined among 61 PCA patients. Baseline questionnaire that assessed optimism/pessimism and distress was administered around the time of diagnoses and distress was assessed again three months later. Results from multiple hierarchical regression models (controlling for baseline measures of distress) revealed that: 1) optimism was significantly related to lesser general- and decisional related distress; 2) pessimism was significantly related to greater decisional related distress; and 3) the relationship between optimism/pessimism and distress differed depending on if optimism/pessimism was defined one-dimensionally or two-dimensionally. These results indicate that optimism could be a protective factor while pessimism might be a risk factor for PCA patients.

Abstract – Icelandic

Blöðruhálskirtilskrabbamein (BHKK), algengasta krabbamein karla í hinum vestræna heimi, getur verið mikill streituvaldur og hafa rannsóknir sýnt fram á aukna streitu meðal nýgreindra karlmanna með BHKK. Hins vegar upplifir hópur sjúklinga litla streitu í kjölfar krabbameinsgreiningarinnar. Markmið rannsóknarinnar var að kanna mögulega vernandi- og áhættuþætti gegn streitu í kjölfar krabbameinsgreiningarinnar, þar sem slíkar upplýsingar gætu verið mikilvægar til að bera kennsl á menn í aukinni áhættu fyrir streitu og fyrir þórun áhrifaríkra inngripa meðal BHKK sjúklinga. Í átt að þessu markmiði var skoðað samband milli bjartsýni, svartsýni og streitu, meðal 61 nýgreindra karla með BHKK. Grunnlínu spurningarlisti sem mældi bjartsýni/svartsýni og streitu var lagður fyrir stuttu eftir greiningu og streita var mæld aftur þremur mánuðum síðar. Niðurstöður margvíðrar aðhvarfsgreiningar (þar sem stýrt var fyrir streitu á grunnlínu) leiddi í ljós að; 1) bjartsýni spáði fyrir um lægri almenna streitu og streitu tengda ákvörðunartöku; 2) svartsýni spáði fyrir um hærri streitu tengdri ákvörðunartöku; og 3) sambandið á milli bjartsýni/svartsýni og streitu var háð því hvort litið var á bjartsýni/svartsýni sem hugtök á einni vídd eða tveimur. Þessar rannsóknir gefa til kynna að bjartsýni gæti verið mögulegur verndandi þáttur og svartsýni áhættuþáttur fyrir streitu í kjölfar krabbameinsgreiningar meðal karla með BHKK.

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Impact of Optimism and Pessimism on Distress among Newly Diagnosed Prostate Cancer Patients.

Prostate cancer is the most common cancer among men living in the Western world, including Iceland, and it is the second-leading cause of cancer deaths among men (American Cancer Society, 2011; Krabbameinsskrá, 2011). The diagnosis of prostate cancer, like other cancer, can be a major life stressor and heightened levels of psychological distress, in particular general distress (e.g., depression and anxiety), are common (Balderson & Towell, 2003; Bisson, Chubb, Bennett, Mason, Jones & Kynaston, 2002; Bloch, Love, Macvean, Duchesne, Couper & Kissane, 2007). For example, Balderson and Towell (2003) who examined general distress among newly diagnosed prostate cancer patients found that 38% of the patients were above the clinical cut-off score of 15 on the Hospital Anxiety and Depression Scale (HADS). Decision-related distress (e.g. regret regarding the treatment choice) has also been reported among prostate cancer patients (Clark, Wray & Ashton, 2001; Clark et al, 2003; Davidson, So & Goldberg, 2007; Hu, Kwan, Saigal & Litwin, 2003; Steginga, Occhipinti, Gardiner, Yaxley & Heathcote, 2004). Steginga et al (2004), for example, reported that 63% of prostate cancer patients, with localized disease, had decisional conflict regarding their treatment choice at diagnoses which persisted for 42% of the patients at twelve-month follow-up assessment and Clark et al (2003) found that approximately 16% of men diagnosed with localized prostate cancer felt at least somewhat regretful about their treatment chose.

While distress is common among prostate cancer patients some fare better than others, therefore it is important to identify factors that are associated with psychological distress as it might assist health care workers in identifying patients that are or aren't at risk for developing heightened levels of distress following their cancer diagnosis as well as providing information for designing novel interventions. Two factors that have attracted growing

attention in recent years for impacting psychological adjustment to cancer are optimism and pessimism (Blank & Bellizzi 2006; Deimling, Bowman, Sterns, Wagners & Kahana, 2006; Schou, Ekeberg, Sandvik, Hjerstad & Ruland, 2005; Stigelis, Hagedoorn, Sanderman, van der Zee, Buunk & van den Bergh 2003). Optimists tend to be favorable in their outlook, and generally believe that good rather than bad things will happen to them. Pessimists on the other hand, tend to expect the worse and anticipate bad outcomes (Sheier & Carver, 1985). Optimism and pessimism tend to be relatively stable characteristics across both time and context (Robinson-Whelen, Kim, MacCallum, Kiecolt-Glaser, 1997; Schou et al, 2005; Sheier & Carver, 1985; Stiegelis et al, 2003) and have been found to be related to different coping strategies, optimism has been found to be related to more adaptive coping strategies (e.g. problem-focused coping), while pessimism has been found to go along with denial and avoiding coping styles when dealing with distress (Chang, 1998; Schou, Ekeberg, Ruland, Sandvik & Kåresen, 2004; Sheier & Carver, 1993). According to Schou et al (2005) different coping styles may affect person's well-being by influencing how individuals approach, copes and reacts to critical life events. While more active coping styles, as those displayed by optimists, can diminish distress, passive coping styles, as employed by pessimists, can enhance feelings of general distress.

Studies among cancer patients that have examined the relationship between optimism/pessimism and distress prospectively (David, Montgomery & Bovbjerg, 2006; Schou et al, 2005; Schulz, Bookwala, Knapp, Scheier & Williamson, 1996; Winterling, Glimelius & Nordin, 2008) and cross-sectionally (Blank et al, 2006; Carver, Smith, Antoni, Petronis, Weiss & Derhagopian 2005; David et al, 2006; Davidson, Geoghegan, McLaughlin & Woodward, 2005; Deimling et al, 2006; Mazanec, Daly, Douglas & Lipson, 2010; Penedo et al, 2006) have found a significant predicative value of optimism/pessimism for distress, where optimism has for example been found to be related to lower levels of anxiety (Dunn,

Occhipinti, Campbell, Ferguson & Chambers 2010; Mazanec et al, 2010; Stiegelis et al, 2003; Zenger, Glaesmer, Höckel & Hinz 2011), depression (Blank & Bellizzi 2006; Dunn et al, 2010; Mazanec, et al, 2010; Zenger, Brix, Borowski, Stolzenburg & Hinz, 2010) and decisional related distress (Steginga & Occhipinti 2006). Pessimism, on the other hand, has been linked to higher levels of anxiety, depression (Zenger et al, 2011) and distress (David et al, 2006).

Nevertheless, the results remain inconsistent, as several studies that have examined this relationship prospectively have found optimism/pessimism not to be a predictor of later distress (Penedo et al, 2006; Percezek, Burke, Carver, Krongrad & Terris, 2002). In addition, studies that have used a more elaborated study design, where the predictive value of optimism/pessimism was examined while controlling for base levels of distress or distress at diagnosis have either found that the predictive value of optimism remained significant but small (Carver, Lehman & Antoni 2003; Lynch, Steginga, Hawkes, Pakenham & Dunn, 2008; Steginga, Lynch, Hawkes, Dunn & Aitken, 2009; Zenger et al, 2010) or that optimism had no additional predictive value for later distress (De Moor, De Moor, Basen-Engquist, Kudelka, Bevers & Cohen, 2006).

Although most of these studies mentioned above used the Life of Orientation Test-Revisited (*LOT-R*) to measure optimism and pessimism they operationalized optimism and pessimism differently, which might in part, explain these discrepant findings. Several studies operationalized or conceptualized optimism/pessimism as one-dimensional but according to this view high score on the *LOT-R* scale represented optimism, while low scores represented either low optimism or pessimism (Blank & Bellizzi, 2006; Carver et al, 2003; Chang 1998; DeMore et al 2006; Dunn et al, 2010; Mazanec et al, 2010; Penedo et al, 2006; Percezek et al, 2002; Schou et al, 2005; Steginga et al, 2006; Steginga et al, 2009; Stiegelis et al, 2003; Winterling et al 2008; Zenger et al, 2010). In recent years, however, investigators have

started to question the one-dimensional view of optimism, and have argued that optimism and pessimism should be considered distinct dimensions (Chang, D’Zurilla & Maydeu-Olivares 1994; Herzberg, Glaesmer & Hoyer 2006; Marshall, Wrotman, Kusulas, Hervig & Vickers 1994; Robison-Whelen, Kim, MacCallum & Kiecolt-Glaser 1997; Schulz et al, 1996; Zenger et al, 2011). Interestingly, this controversy is not a new one. When the *LOT* scale was developed, Scheier and Carver (1985) concluded that the scale should be considered one-dimensional, despite the fact that their own original factor analysis produced two factors that corresponded to positive and negative items in the *LOT* scale.

The different operationalization or conceptualization of optimism and pessimism is not a merely an academic issue but also applied, as demonstrated by studies that have shown that optimism and pessimism have differential relations to psychological variables (e.g. distress) (Marshall et al, 1994; Robinson-Whelen et al, 1997; Schou et al, 2004). For example, a study by Stiegelis et al (2003) that used a one-dimensional view of the *LOT-R* concluded that low optimism was a significant predictor of anxiety among cancer patients, while a study by Schou et al (2004) that used a two-dimensional view of the *LOT-R* found that pessimism, but not low levels of optimism, predicted higher levels of both anxiety and depression among breast cancer patients. Furthermore, previous studies that have examined the relationship between optimism/pessimism and distress have several limitations, were majority of the studies have focused on breast cancer patients, used the one-dimensional view of the *LOT-R* and were either cross-sectional or prospective were base levels of distress were not controlled for. Given the different methods of previous research, the inconstant findings and the shortage of research among prostate cancer patients, the main aim of the present study was to examine the relationship between optimism, pessimism and general- and decisional related distress among newly diagnosed prostate cancer patients, using both one-dimensional and two-dimensional view of the *Life of Orientation Test-Revisited (LOT-R)*.

Method

Participants

A total of 123 men were offered participation in the study, were eighteen refused to participate. To be eligible for the study, the patients had to be newly diagnosed, have localized prostate cancer and have no previous history of cancer. Of the 107 men that began participation, 46 were not included in this study, as not everyone had not completed follow-up assessment (N=28) or had missing data on one or more of the questionnaires (N=18). Thus a total of 61 men participated in the study.

Procedure

In collaboration with the National University Hospital of Iceland and with the approval of an ethical committee in Iceland, newly diagnosed men with prostate cancer were asked to participate in the research. An urologist introduced the study to his patients and asked if a member of the research team could call them to describe the study further. Interested patients were then contacted by a member of the research team who described the study in detail, addressed any questions and concerns and, for interested patients, scheduled an in person meeting at the facility of the Icelandic Cancer Registry. During that meeting an informed consent was obtained and the participant completed a baseline questionnaire. Three months later, a second questioner (at three-month follow up) was mailed to the participants, along with a pre-stamped envelope for them to return the questionnaire. All patients were provided with a phone number for a licensed clinical psychologist whom they could contact if they wanted to discuss their distress and concerns.

Measures

Demographic/Medical information was assessed with questions considering both basic demographic information (e.g., age, education, marital status) as well as medical information (e.g., time since diagnoses and type of treatment).

Optimism/Pessimism was assessed at baseline with the Icelandic translation of the Life of Orientation Test-Revisited (LOT-R), which was translated to Icelandic by Ágústdóttir and back translated to English by Smari. The scale consist of 6-items, containing three items each for positive and negative general life expectations (Scheier, Carver, & Bridges, 1994). Participants were asked to indicate their extent of agreement to each statement from 0 (strongly disagree) to 4 (strongly agree). Examples of items are 'In uncertain times I usually expect the best' and 'I hardly ever expect things to go my way'. Even though the *LOT-R* was originally regarded as a one-dimensional scale with optimism and pessimism as the two endpoints it has been argued that the *LOT-R* scale has two-dimensions, were optimism (as measured by positively phrased statements) and pessimism (as measured by negatively phrased statements) are regarded as two independent factors (Chang et al, 1994; Herzberg et al, 2006; Marshall et al, 1994). Thus, in the present study summary scores were calculated for optimism and pessimism as well as for the total sum score (were answers to the negatively phrased statements were reversed before calculating the total sum score). The possible range was 0 to 24 for the total sum score, and 0 to 12 for each subscale, were higher scores indicate higher degree of optimism/pessimism. The scales had decent internal reliability in the present study, or $\alpha=0.65$ for the total sum score, $\alpha=0.74$ for pessimism and $\alpha=0.71$ for optimism (see factor analysis below).

General distress was assessed, at baseline and at the three-month follow-up assessments, with the Icelandic translation (Schaaber, Smari & Oskarsson, 1990) of the Hospital Anxiety Depression Scale (HADS) which consists of fourteen questions, seven

items assess depression and seven assess anxiety (Zigmond & Snaith, 1983). Subjects were asked to rate how well each statement applied to them on a four-point Likert Scale, from (0) never to (3) always. A summary score was computed for each subscale, with the possible range of 0-21 for both subscales. In the present study the internal consistency was good for the HADS scale at both assessments, or $\alpha=0.77$ and $\alpha=0.74$ for anxiety and $\alpha=0.74$ and $\alpha=0.69$ for depression, respectively.

Decisional related distress was assessed with the Decisional Conflict Scale (DCS), the Decisional Regret Scale (DRS) and the Satisfaction With Decision scale (SWD). All of these scales had previously been translated to Icelandic (Guðmundson, 2010). The DCS scale was administered at both assessments while the other two were administered at the three-month follow-up assessment. The 12 items DCS scale (O'Connor, 1995; Guðmundson 2010) which was used to assess decisional conflict (i.e. decisional uncertainty) regarding the treatment decision had excellent internal reliability at both assessments, or $\alpha=0.92$ and $\alpha=0.95$. The DRS, which consists of 5 items, was used to assess regret regarding the treatment decision (Brehaut et al, 2003; Guðmundson 2010). DRS had good internal reliability or $\alpha=0.68$. The SWD, which consists of six questions used to assess how satisfied the patients were with their treatment decision (Holmes-Rovner et al, 1996; Guðmundson 2010), had excellent internal reliability or $\alpha=0.88$.

On all of the scales participants were asked to rate how well each statements applied to them on a five-point Likert Scale, from (0) strongly disagree to (4) strongly agree. As recommended by the authors of the scales a means score was computed for the DCS and DRS scales, which was multiplied by 25 to get a range of 0 to 100. For the SWD scale a total score was computed by adding up the raw scores, with the possible range of 5 to 25. Higher scores indicate more decisional conflict, more decisional regret and more decisional satisfaction.

Design and data analysis

Descriptive statistics were calculated to provide information about participant's characteristics as well as prevalence of general- and decisional related distress and its relation to optimism/pessimism. Exploratory factor analysis was then used to examine the construct of the Life of Orientation Test-Revisited (i.e. if it was one-dimensional or if it had two partially independent factors). Next, the data was examined for potential confounding variables, where the results revealed that age was significantly related to both anxiety assessed around the time of diagnoses ($p < .05$) and to decisional regret ($p < .05$), employment status was significantly related to anxiety assessed around the time of diagnoses ($p < .05$) and marital status had significant relations to decisional conflict assessed around the time of diagnoses ($p < .05$). Finally, hierarchical regression was performed to examine the main predictions, with and without confounding variables. The confounding variables did not alter the results, and thus the results are reported without the confounding variables. A multilevel modeling procedure was necessary to see the relationship between optimism/pessimism (independent variable) and distress (dependent variable) measured at three-month follow-up independently from the level of distress at recruitment.

When the data was scanned for missing values, it became clear that in few instances participants had not answered all the items on the scales. Missing values were replaced with series mean for those scales that had less than 10% of the items missing.

Results

Sample Characteristics

Demographic characteristics of participants are shown in Table 1. The mean age of participant was around 66 years ($SD=8.52$) and over 80% of them were married. A little over half (51.7%) of the sample had college education and majority (93%) had received their cancer diagnoses within 8 weeks of recruitment.

Table 1. Sample characteristics

Demographic variables	Frequency (Percentage)
Age at diagnoses	
≥ 50 years old	2 (3%)
51-60 years old	11 (18%)
61-70 years old	28 (47%)
≤ 71 years old	19 (32%)
Marital status at diagnoses	
Married or partnered	50 (83.3%)
Single	10 (16.7%)
Employment	
On the employment marked	31 (52.5%)
Retired/has other employment status	28 (47.5%)
Education at diagnoses	
Compulsory Education	9 (15%)
College education	31 (51.7%)
University education	11 (18.3%)
Other	9 (15%)
Time since diagnoses	
≤ 2 weeks	13 (23.2%)
3-4 weeks	25 (44.6%)
≥ 5 weeks	18 (32.2%)

Factor analysis

To test the construct of the *LOT-R*, an exploratory factor analysis was conducted on the six items that make up the *LOT-R* scale, followed by a varimax rotation. Both the eigenvalues-greater-than-1 criterion and the-ratio-of-eigenvalue-difference (i.e. scree plot) suggested that a two-factor solution was the most appropriate for the *LOT-R* scale, were negatively phrased items loaded on factor 1 (pessimism) and positively phrased items loaded on factor 2 (optimism). These two-factors accounted for 68% of the variance. Varimax-rotated factor loadings for the two-factor solution are shown in Table 2.

Table 2. Varimax-rotated factor loadings for the Life of Orientation Test-Revisited

Item content	Pessimism	Optimism
I rarely count on good things to happening to me	.87	
I hardly ever expect things to go my way	.87	
If something can go wrong for me, it will	.71	
Overall, I expect more good things to happen to me than bad		.86
I'm always optimistic about my future		.78
In uncertain times, I usually expect the best		.73

Note: Factor loadings below .3 are not shown in the table for clarity purposes

Both factors had good internal reliability in the present study, or $\alpha=0.74$ for pessimism and $\alpha=0.71$ for optimism. Furthermore, a correlation analysis was conducted to examine the relation between the two factors, which revealed a non significant relationship between optimism and pessimism ($r=-.13$, $p=.34$). These results indicate that the *LOT-R* scale does in fact measure two independent factors, i.e. optimism and pessimism. Thus, these two subscales, along with the *LOT-R* total score, will be used in further analysis.

Descriptive and Correlational analysis

Table 3, displays descriptive and correlation statistics for optimism, pessimism (i.e. two dimensional view) and the *LOT-R* sum score (one-dimensional view) and distress measured both around the time of diagnosis and again three-months later. Men reported relatively high levels of optimism ($M=8.25$: possible range 0 to 12) and relatively low levels of pessimism ($M=4.08$: possible range 0 to 12) at diagnoses. Although fairly low levels were reported of general distress (i.e. anxiety and depression) at both time points, there was a variability that suggests that some men experience more distress than others. The same was true for decisional related distress, where considerable variability was found among low levels of reported decisional related distress among the men.

As shown in Table 3 higher levels of optimism, from the two-dimensional view, were associated with significantly lower levels of depression at baseline and with lower levels of depression, anxiety, decisional conflict and decisional regret at the follow-up assessment. Higher levels of pessimism, from the two-dimensional view, were also associated with significantly higher depression at baseline and with higher levels of decisional regret at follow-up assessment. Furthermore, pessimism was associated with significantly lower levels of decisional satisfaction at follow-up assessment. The results from the one-dimensional view (See Table 3) revealed that, apart from decisional conflict at baseline, higher levels of optimism were related to the remaining distress measures at both the baseline and the follow-up assessments.

Table 3. Descriptive and correlation statistics for baseline measures of optimism, pessimism and *LOT-R* sum score and distress measured at baseline and three-months later.

	Mean	SD	Two-dimensional view		One-dimensional view
			Optimism ^a	Pessimism ^a	Sum Score ^a
			<i>R</i>	<i>R</i>	<i>R</i>
1. Anxiety BL ^b	2.12	2.25	-.24	.15	-.26*
2. Depression BL	1.56	2.04	-.40*	.31*	-.47**
3. Decisional Conflict BL	33.76	17.99	-.10	.09	-.13
4. Anxiety FU ^c	1.60	2.07	-.34*	.08	-.27*
5. Depression FU	1.92	2.18	-.45**	.12	-.36*
6. Decisional Conflict FU	17.28	14.99	-.40*	.22	-.32*
7. Decisional Regret FU	16.10	16.74	-.39*	.29*	-.46**
8. Decisional Satisfaction FU	22.03	3.11	.21	-.33*	.38**

Note: The possible range for measures of anxiety and depression was 0-12. For decisional conflict and decisional regret the range was 0-100 and for decisional satisfaction the range was 5-25.

^aOptimism (M=8.25, SD=2.06, Range: 0-12), Pessimism (M=4.08, SD=2.39, Range: 0-12), Sum Score (M=16.17, SD=3.34, Range: 0-24);

^bBL: Baseline measures, taken around the time of diagnoses;

^cFU: Follow-up measures, taken three months from recruitment.

* $p < .05$, ** $p < .001$

Regression analysis testing if optimism, pessimism or *LOT-R* total score predicts distress at three-month follow-up

Optimism, Pessimism, LOT-R and General Distress

Hierarchical regression was used to determine to what extent optimisms, pessimism and the total *LOT-R* score contributed to the prediction of general distress at three-month follow-up, i.e. depression and anxiety. For each independent variable (i.e. predictor), two separate regression models were conducted, one for anxiety and one for depression. In the former models, baseline measures for anxiety was entered in step 1 of the analysis and the independent variable—i.e. optimism, pessimism or *LOT-R* total score—was entered in step 2. In the latter model, baseline measures for depression were entered in step 1 of the analysis followed by the predictor variables in step 2 of the analysis.

As can be seen in Table 4, baseline measures of general distress were a strong and a significant predictor for general distress at follow-up and explained 28% of the total variance of anxiety and 40% of the total variance of depression measured at three-month follow-up. Optimism from the two-dimensional view was also a significant predictor of general distress at three-month follow-up, when controlled for baseline measures of general distress, and added 5% to the total explanation of both models. On the other hand, pessimism and the *LOT-R* total score were not significant predictors of general distress at 3 months follow-up.

Table 4. Hierarchal regression model for general distress, were optimism, pessimism and *LOT-R* total were used as predictors.

			Outcome			
			Anxiety at three month FU		Depression at three month FU	
Model			<i>B</i>	<i>R</i> ²	<i>β</i>	<i>R</i> ²
Two-dimensional	Step 1	Anxiety BL	.53**	.28		
	Step 1	Depression BL			.63**	.40
	Step 2	BL ^a	.47**	.33	.54**	.45
		Optimism	-.23**		-.24*	
	Step 1	Anxiety BL	.53**	.28		
	Step 1	Depression BL			.63**	.40
	Step 2	BL ^a	.53**	.28	.66**	.41
		Pessimism	-.001		-.09	
One-dimensional	Step 1	Anxiety BL	.53**	.28		
	Step 1	Depression BL			.63**	.40
	Step 2	BL ^a	.49**	.30	.60**	.41
		Sum Score	.14		-.08	

Note: ^aWhen anxiety at three-month follow-up (FU) was the outcome variable, anxiety measured around the time of diagnoses (BL) was entered in step 2 of the model. However, when depression at three-month follow-up (FU) was the outcome variable, depression measured around the time of diagnoses (BL) was entered in step 2 of the model.

* $p < .05$, ** $p < .001$.

Optimism, Pessimism, LOT-R and Decision Related Distress

Hierarchical regression was used to determine to what extent optimism, pessimism and *LOT-R* total score contributed to the prediction of decisional related distress, i.e. decisional conflict, decisional regret and decisional satisfaction. Three separate regression models were conducted—one for each of the decisional related distress measure—for each predictor. Since decisional regret and decisional satisfaction were not assessed at recruitment, two single-step and one two-step regression analyses were conducted. In the two-step regression analysis, baseline measures of decisional conflict were entered in step 1 of the analysis and the predictors were entered in step 2. In the single step analysis, the predictors were entered in step 1 of the analysis.

As can be seen in Table 5, conflict at baseline was not a significant predictor of conflict three months later. Optimism from the two-dimensional view was a significant predictor for decisional conflict at three-month follow-up after controlling for baseline measures of conflict and accounted for 17% of the 19% that the model explained of the total variance of conflict at three-month follow-up. Pessimism from the two dimensional view was a significant predictor for satisfaction at three-month follow-up. Furthermore, optimism from the one-dimensional view (i.e. *LOT-R* total score) was a significant predictor for both decisional conflict and satisfaction. Finally optimism, pessimism and the *LOT-R* total score were all significant predictors for regret at three-month follow-up. The *LOT-R* total score was the strongest predictor of these three, accounted for 21% of the total variance of regret, followed by optimism (16%) and pessimism (8%).

Table 5. Hierarchal regression model for decisional related distress, were optimism, pessimism and *LOT-R* total were used as predictors.

			Outcome					
			Conflict at three month FU ^a		Regret at three month FU ^b		Satisfaction at three month FU ^b	
Model			β	R^2	β	R^2	β	R^2
Two-dimensional	Step 1	Conflict BL	.14	.02				
	Step 1	Optimism			-.40*	.16	.21	.05
	Step 2	Conflict BL	.09	.19				
		Optimism	-.41**					
	Step 1	Conflict BL	.14	.02				
	Step 1	Pessimism			.29*	.08	-.33*	.11
One-dimensional	Step 2	Conflict BL	.13	.05				
		Pessimism	.18					
	Step 1	Conflict BL	.14	.02				
	Step 1	Sum Score			-.46**	.21	.38*	.14
	Step 2	Conflict BL	.08	.18				
		Sum Score	-.41**					

Note: ^a A two step model was conducted when decisional conflict at three-month follow-up (FU) was the outcome variable, were decisional conflict measured around the time of diagnoses (BL) was entered in step 1 of the analysis and the predictors (optimism/pessimism/sum score) were entered in step 2.

^b Since decisional regret and decisional satisfaction were not assessed at recruitment, the models were regret and satisfaction are the outcome are only single step, were optimism, pessimism or the sum score were entered in step 1 of the analysis.

* $p < .05$, ** $p < .001$.

Discussion

The current study offers insight into the relationship between optimism, pessimism and psychological distress following diagnoses of prostate cancer. The main aim of the present study was to examine this relationship using both one-dimensional and two-dimensional view of the *Life of Orientation Test-Revisited (LOT-R)*.

The results from the factor analyses showed that *LOT-R* consisted of two separate factors, optimism and pessimism. In addition, the correlation between these factors was not significant supporting the idea that these two constructs are independent. These findings are consistent with previous studies that have argued for the two-dimensional view of the *LOT-R* scale (Chang et al, 1994; Herzberg et al, 2006; Marshall et al, 1994; Robison-Whelen et al, 1997).

The results also revealed the relationship between optimism/pessimism and general distress differed depending on how optimism/pessimism was operationalized. For example, when optimism was operationalized as a high score on the *LOT-R* scale and pessimism as low scores on the *LOT-R* scale (i.e. one-dimensional view of the *LOT-R* scale) optimism and pessimism assessed around the time of diagnoses did not predict anxiety or depression three months later, when base levels of distress was controlled for. However, when optimism was measured by positively phrased items in the *LOT-R* scale and pessimism was measured by negatively phrased items (i.e. two-dimensional view of the *LOT-R*) optimism did predict anxiety and depression, while pessimism did not. Thus, had one adopted the one dimensional view of the *LOT-R* scale then one would have concluded that optimism was unrelated to general distress while the two dimensional view showed that optimism was indeed related to both depression and anxiety. These findings are consistent with previous studies that have

found optimism (from the two-dimensional view) to be a predictor of general distress (e.g. Zenger et al, 2010)

Similarly, the relationship between decisional related distress and optimism/pessimism differed depending on how optimism/pessimism was operationalized. When taking a one-dimensional view of the *LOT-R* scale, one would argue that optimism was a significant predictor of satisfaction because the *beta* value is both positive and significant. However, when this relationship was examined from the two-dimensional view, it became clear that it was not optimism that was a significant predictor of satisfaction. In fact, it was pessimism that was a significant predictor of satisfaction with treatment decision. This finding raise the possibility that the beneficial findings of optimism widely reported in the literature might be due to pessimism but not optimism as the one-dimensional view of *LOT-R* might have masked such effects (Robinson-Whelen et al, 1997).

These results reviewed above support previous studies that have claimed that it might be too simplistic to look at optimism and pessimism as opposites ends on a single, bipolar dimension, as it is clear—when taking a two-dimensional view of the *LOT-R*—that optimism and pessimism have different relations to different psychological variables (Chang et al, 1994; Herzberg et al, 2006; Marshall et al, 1994; Robison-Whelen et al, 1997; Schulz et al, 1996; Zenger et al, 2011).

Another noteworthy finding is that the results differed considerably depending on whether the analyses controlled for baseline measures of distress or not. Most of the distress, assessed around the time of diagnosis, was significantly related to distress three-months later. This highlights the importance of controlling for distress measured at diagnoses to assess the independent impact of optimism and pessimism on distress at follow-up or three months later. The relationship between optimism/pessimism and distress was less robust when baseline levels were controlled for. For example, after controlling for baseline levels of

anxiety, the predictive value of optimism from the two-dimensional view remained significant but small, explaining around 5% of the total variance in anxiety, while the correlation analyses that did not control for base levels of anxiety suggested that optimism explained around 12% of the total variance in anxiety at three-month follow-up. These results are in line with previous studies, where Zenger et al (2010) found that the predictive value of optimism on general distress among urogenital cancer patients was around 2% after controlling for baseline measures of general distress. These findings are important, as one would conclude that optimism accounts for much more of the variability in distress when base levels of distress are not controlled for. Furthermore they raise the possibility that the beneficial findings of optimism widely reported in the literature might be much smaller as most studies that have examined the relationship between optimism/pessimism and distress have not controlled for base levels of distress (e.g. Dunn et al, 2010; Zenger et al, 2010).

The present study is not without its limitations. First, the patients' sample is relatively small or only 61 participants. Additionally, we don't know if those patients that refused participation in the study at the doctor office or when contacted by a member of the research team differed from those who participated. For example, distress levels both at the time of diagnoses and at three-month follow-up were relatively modest. Thus, patients that agreed to participate might have been better off than those that declined participation. In addition, the measure of the studies key variables—optimism and distress—was self-reported, and thus might be biased. These limitations should be kept in mind in interpreting the findings.

Nonetheless, these findings have both theoretical and applied implications. From the theoretical perspective they add to the increasing literature that have argued for the importance of conceptualizing optimism and pessimism as two partially independent concepts, as studies have shown that optimism and pessimism have differential relations to different psychological variables (Schou et al, 2004; Zenger et al, 2010; Zenger et al 2011). From the

applied perspective the results provide valuable information regarding the relationship between optimism/pessimism and distress, were they indicate that optimism might be a protective factor for newly diagnosed prostate cancer patients, while pessimism might be a risk factor. Furthermore, they highlight that reported distress shortly after diagnoses is the strongest predictor for distress three-months later. Thus it is important to identify those patients that report distress at diagnoses and offer them some type of intervention that aims to prevent further distress. Additionally, it is important to offer these men an intervention that aims to enhance optimistic outlook, while diminishing pessimistic outlook, as optimism and pessimism differentially affected distress. Such type of intervention could thus enhance the protective value of optimism while diminishing the adverse effect of pessimism, which could either hinder or diminish future distress for those patients. Although the idea of psychological intervention design specifically to enhance optimism outlook and diminish pessimism outlook is attractive, there are no studies to the knowledge of the author that have examine just that. However, in the recent years, some authors have put forward speculations concerning how psychological interventions (i.e. cognitive therapy) can affect people's optimistic and pessimistic outlook (Pretzer & Walsh, 2001).

The role of optimism and pessimism in psychological adjustment to cancer remains unclear, but the present data suggest that optimism might be a potential protective factor against distress, while pessimism could be risk factor. It is crucial that future researches further investigate the relationship between optimism/pessimism and distress, using the two-dimensional view of the *LOT-R* scale while controlling for baseline measures of distress, to generate empirically grounded advice for prostate cancer patients about ways to enhance their psychological well-being after the diagnoses of cancer.

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