Rumination, Reflection and Distress: An 8-month Prospective Study of Colon-cancer

Patients

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Abstract

Self-focused thoughts may be both adaptive and maladaptive. We asked 67 patients who had received a colon-cancer diagnosis within the past 1-7 months to complete measures of rumination, reflection, intrusive and avoidance symptoms and depressive symptoms. At 8 months follow-up they completed the same measures. Higher rumination at time 1 was associated with more symptoms at both times 1 and 2. Reflection at time 1 did not show any associations with symptoms at time 1 and 2. However, time 1 reflection predicted time 2 avoidance symptoms, while controlling for time 1 avoidance symptoms. This suggests that while reflection may not be as maladaptive as rumination, it may still under some circumstances be associated with increased symptoms.

Keywords: rumination, reflection, distress, cancer

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Receiving a diagnosis of cancer is generally stressful and cancer patients experience disruptions in many areas such as occupation and social roles (Bellizzi, Miller, Arora, & Rowland, 2007; Stanton, 2006; Stanton, Revenson, & Tennen, 2007). Cancer-related distress typically declines over the first 1-2 years after diagnosis, but individual trajectories differ. Female gender, younger age, low social support and low optimism have been shown to be associated with higher distress (Meyerowitz, Kurita, & D'Orazio, 2008; Stanton et al., 2007). In addition, cognitive and coping processes, such as rumination, play a role in individual differences in distress (Compas et al., 2006; Creswell et al., 2007; Stanton et al., 2007).

Rumination, which refers to repetitive, negative and self-focused thoughts in response to negative moods and events (Martin & Tesser, 1996; Nolen-Hoeksema, 1991), may explain why some individuals experience more distress in response to cancer. Individuals who ruminate experience more depressive symptoms and Post-Traumatic Stress Disorder (PTSD) symptoms (see Aldao, Nolen-Hoeksema, & Schweitzer, 2010; Watkins, 2008 for reviews). Specifically in relation to cancer patients, higher levels of rumination are associated with more PTSD symptoms and distress (e.g. Chan, Ho, Tedeschi, & Leung, 2011; Rinaldis, Pakenham, Lynch, & Aitken, 2009).

It is, however, important to distinguish between maladaptive self-focused thoughts, such as rumination, and potentially adaptive self-focused thoughts, like reflection. Following Trapnell and Campbell (1999), reflection is conceptualized as an intellectual form of self-focus and an “epistemic self-consciousness [that] may chiefly involve playful

exploring of novel, unique, or alternative self-perceptions” (p. 290). To the best of our knowledge, no studies have examined the relation between reflection and distress in cancer-patients. Since self-focused thoughts are targeted in psychotherapy, it is important to establish whether maladaptive (rumination) and adaptive (reflection) self-focused thoughts are differentially associated with distress. More specifically, whether reflection is associated with reduced distress in response to cancer. In the present study we therefore examined these two distinct types of self-focused thoughts, that is reflection and rumination, in relation to distress in cancer patients.

Rumination, reflection and distress

The distinction between maladaptive and adaptive self-focused thoughts has received much attention (see Treynor, Gonzalez, & Nolen-Hoeksema, 2003 and Watkins, 2008 for prominent examples). Here we focus on the distinction between rumination and reflection proposed by Trapnell and Campbell (1999), because their reflection concept is clearly adaptive and hence we use their operationalization. Trapnell and Campbell (1999) pointed out that some types of self-focused thoughts are a prerequisite for insight and thus adaptive. They developed the Rumination-Reflection Questionnaire (RRQ), where the rumination subscale captures neurotic self-focused thoughts motivated by threat and the reflection subscale captures epistemic self-focused thoughts motivated by curiosity. They found that the two subscales were differentially associated with personality traits and only rumination was related to distress.

Trapnell and Campbell's distinction between rumination and reflection has spurred many studies. A common finding is that while rumination is associated with increased distress, reflection generally shows no association with distress (e.g. Boyraz & Efstathiou, 2011; Jones, Papadakis, Hogan, & Strauman, 2009). When controlling for rumination,

reflection is inversely associated with distress (e.g. Jones et al., 2009). However, prospective studies are sparse.

Most studies comparing the effects of rumination and reflection on distress do not include measures of negative life events. When rumination and reflection have been studied in the context of negative life events, the studies have either subsumed different events (e.g. Chan, Miranda, & Surrence, 2009; Moberly & Wakins, 2008) or differing time intervals (often several years) between the event and the study (e.g. Boyraz & Efstathiou, 2011).

We therefore examined rumination and reflection in relation to depressive, intrusion and avoidance symptoms while keeping the stressor (receiving a diagnosis of colon cancer) and the time since the event (1-7 months) relatively stable. Because previous studies indicate that adaptive effects of reflection only appear prospectively (Treynor et al., 2003), we assessed distress shortly after the diagnosis, 1-7 months (T1, mean number of days since diagnosis = 72 (SD = 34)) and again at a follow-up eight months later (T2).

Method

Participants and recruitment

A convenience sample of 67 participants was recruited from Aarhus University Hospital over a 3-year period. The participants were patients, diagnosed with colon cancer and referred for chemotherapy at the Department of Oncology. Exclusion criteria were dementia, psychotic disorder and inability to understand Danish. All participants provided informed consent. At T2, 74% of participants indicated that they had gone through an operation as part of their treatment and 93% indicated that they had received chemotherapy as part of their treatment (data for T1 is missing).

The cancer diagnoses of the participants were classified (stage I to IV) according to the cancer staging manual from American Joint Committee on Cancer (Cancer Staging Manual, 6th ed., 2002).

At T1 (1-7 months after diagnosis), there were 67 participants (36 men, 54%; 31 women, 46%) with a mean age of 63.54 years ($SD = 8.27$). Of these, 2 were never married, 54 were married or co-habiting, 6 were divorced and 5 were widowed. Highest achieved education was: Elementary school (14), formal manual training following elementary school (12), high school (12), college (2-4 years post high school education, 12), university (5 years post high school education, 7) and some other education (9) (1 missing). Regarding work status, 23 were working, 2 were unemployed, 40 were retired and 1 indicated "other" (1 missing). Ethnicity was not assessed, but almost all Danish citizens are Caucasian and hence this was likely the case for the present sample, where non-Danish speaking immigrants were excluded. Refusal rates were not recorded.

At the follow-up eight months later, 54 of the 67 participants returned the questionnaire (response rate 81%). These 54 participants (31 men, 57%; 23 women, 43%) had a mean age of 63.87 years ($SD = 8.28$) at T1. There were no significant differences between responders and non-responders at T2 on any of the T1 measures ($t(62-65)$ from 0.54-1.78, $ps > 0.05$), cancer stage ($t(65) = 0.95$, $p > 0.10$ or on the demographic variables (χ^2 s (1-5) from 1.51-6.32, $ps > 0.05$).

Procedure

At their first visit at the Department of Oncology, patients were invited by a nurse to participate in a questionnaire study on memory for negative events and distress. Patients who indicated an interest were given an informed consent form and a questionnaire package to be completed at home. The names and addresses of these patients were

recorded and forwarded to the first author. If the patients had not returned the questionnaires within two weeks, they were sent a reminder.

After 8 months, the participants received an information letter, an informed consent form and a package of questionnaires identical to the T1 packet. They were also asked whether they had experienced a relapse (9 participants indicated relapse, i.e. metastases or local relapse of colon cancer). Had participants not returned the questionnaires after 2 weeks, they were sent a reminder.

Materials

The questionnaire package included scales measuring rumination and reflection, cancer-related intrusive and avoidance symptoms and depressive symptoms as well as additional questions not included in the present study. Each participant reported the date he/she received the cancer diagnosis and the date for completing the questionnaire. These two dates were used to calculate number of days between diagnosis and completion of the questionnaire. Each package took approximately two hours to complete. For the scales, missing items were replaced using series means if no more than half of the items were missing.¹

Rumination and reflection. Rumination and reflection were measured using the Rumination-Reflection Questionnaire (RRQ, Trapnell & Campbell, 1999). We chose the RRQ, as it operationalizes reflection as an adaptive form of self-focused thoughts. The RRQ consists of 12 rumination items (e.g. "My attention is often focused on aspects of myself I wish I'd stop thinking about) and 12 reflection items (e.g. "I love analyzing why I do things."). Each item is assessed on 5 point scales (higher scores indicating higher degree of rumination and reflection). The scales showed good internal reliability in the present

sample (Cronbach's α s = 0.90 and 0.85 for the rumination and reflection scales respectively).

Intrusion and avoidance symptoms. Cancer-related intrusive and avoidance symptoms were measured using the Impact of Event Scale (IES, Horowitz, Wilner, & Alvarez, 1979). The scale consists of 15 questions assessing intrusion and avoidance responses to stressful events, here adapted to refer to cancer-related experiences. The questions are answered on 4 point scales, here scored as 0-3, with higher scores reflecting higher degree of intrusion and avoidance. The two subscale showed good internal reliability in the present sample (Cronbach's α s = 0.87 and 0.80 for intrusive and avoidance symptoms respectively).

Depressive symptoms. Depressive symptoms were measured using the Beck's Depression Inventory, second edition (BDI-II, Beck, Steer, & Brown, 1996). The scale consists of 21 items measuring cognitive, affective and somatic symptoms of depression rated on 0-3 point scales (higher scores reflecting higher degree of symptoms), and showed good internal reliability in the present sample (Cronbach's α = 0.84).

Results

The means and standard deviations for all variables at T1 and T2 are shown in Table 1. There were no significant gender differences for any of the variables ($ts(52-65) < 1.17$, $ps > 0.10$). Neither did cancer stage or time since diagnosis correlate with any of the variables in the study (cancer stage: $r_s(52-65)$ between -0.23 and 0.06, $ps > 0.09$; time since diagnosis: $r_s(43-54)$ between -0.12 and 0.01, $ps > 0.10$). Hence these variables are not controlled for in the following analyses. Participants who indicated relapse at T2 did not differ significantly from participants who did not indicate relapse on the variables in the study ($ts(52-65) < 1.42$, $ps > 0.10$). This may be because the participants generally

showed little reduction in distress over time (see analyses below). Even though T2 participants with relapse did not differ from T2 participants without relapse, below we analyse the data both with and without these participants in order to examine this in more depth.

A series of within-subjects t-tests showed that depressive symptoms dropped significantly over time. In addition, a trend towards an increase in rumination over time was found (see Table 1). These results were generally unchanged when the nine participants with relapse at T2 were excluded from the analyses. The participants thus experienced little reduction in symptoms over time, perhaps because they had only recently completed treatment, which is typically experienced as stressful.

To examine whether rumination and reflection were differentially associated with distress a series of Spearman's correlations were calculated (see Table 1). The main findings from these correlations are that whereas rumination was associated with increased distress, measured both cross-sectionally and prospectively, reflection showed no significant associations with distress. These results were largely unaffected when the nine participants with relapse were excluded (although correlations between rumination at T1 and intrusive, avoidance and depressive symptoms at T2 dropped to below statistical significance).

In order to examine more directly whether rumination and reflection were differentially associated with distress, we compared the correlation coefficients between rumination and the three variables: a) intrusive symptoms, b) avoidance symptoms and c) depressive symptoms with the correlation coefficients between reflection and the same three variables using Hotelling's t (Hotelling, 1940; see Table 1). Hotelling's t tests whether the magnitude of two correlations coefficients differ significantly from each other

and is used when comparing correlation coefficients that are not independent (e.g. the same variable, here symptoms, is correlated with two other variables, here rumination and reflection). The test is necessary here because two correlations may differ in whether they are significant or not, without being significantly different from each other. At T1, the correlations for depressive symptoms and avoidance symptoms with rumination were significantly different from the correlations between reflection and depressive symptoms (Hotelling's $t(62) = 2.86, p < 0.05$) and reflection and avoidance symptoms (Hotelling's $t(60) = 3.05, p < 0.05$). The difference in correlations between rumination-intrusive symptoms and reflection-intrusive symptoms did not quite reach conventional levels of significance (Hotelling's $t(60) = 1.73, p < 0.10$). However, none of the correlation coefficients between rumination or reflection at T1 and the T2 measures of intrusive symptoms, avoidance symptoms and depressive symptoms were significantly different from each other (although the difference between the two correlations with depressive symptoms was just above conventional level of significance, Hotelling's $t(50) = 1.87, p < 0.10$). Regarding correlations between rumination and reflection at T2 and distress at T2, the correlation coefficients between rumination, depressive symptoms and avoidance symptoms at T2 were significantly different from the correlations between reflection, depressive symptoms and avoidance symptoms at T2 (Hotelling's $ts(51) = 3.24$ and $2.34, ps < 0.05$ respectively). The difference in correlations between rumination-intrusive symptoms and reflection-intrusive symptoms was not significant (Hotelling's $t(51) = 1.61, p > 0.05$). All in all these analyses confirm that rumination and reflection show significantly different relationships with distress.

In order to examine whether rumination and reflection at T1 predicted distress over time, three regressions were conducted with intrusive symptoms, avoidance symptoms or

depressive symptoms at T2 as the dependent variables and controlling for either intrusive symptoms or avoidance symptoms or depressive symptoms at T1. In these analyses we controlled for age, because higher age has been shown to be associated with lower distress (Meyerowitz et al., 2008). Both rumination and reflection at T1 were entered as predictor variables simultaneously, because the unique relationships between distress and rumination and between distress and reflection are more adequately addressed when controlling for the other variable.

For intrusive symptoms, the overall model was significant ($F(4, 47) = 8.02, p < 0.05$, *adjusted* $R^2 = 0.36$). Intrusive symptoms at T1 predicted intrusive symptoms at T2, but none of the other variables were significantly associated with T2 intrusive symptoms.

For avoidance symptoms, the overall model was significant ($F(4, 47) = 8.20, p < 0.05$, *adjusted* $R^2 = 0.36$). Avoidance symptoms at T1 predicted avoidance symptoms at T2. The only other significant variable was reflection at T1, but the association was in the opposite direction of expected. That is, higher degree of reflection at T1 predicted *more* avoidance symptoms at T2.

For depressive symptoms the overall model was also significant ($F(4, 48) = 15.81, p < 0.05$, *adjusted* $R^2 = 0.53$). However, only depressive symptoms at T1 predicted depressive symptoms at T2.

To further examine the unexpected positive association between reflection at T1 and avoidance symptoms at T2, we conducted the regression analysis under the following conditions: 1) excluding participants who reported relapse at T2, 2) using only participants with no need for replacement of missing values, 3) controlling for rumination at T2. However, all regressions still showed a positive relationship between reflection at T1 and avoidance symptoms at T2, testifying to the robustness of the association.²

Discussion

The main findings were that while rumination was associated with increased depressive, intrusive and avoidance symptoms at both T1 and T2, reflection showed no association with symptoms at T1 and T2. The regression analysis controlling for T1 avoidance symptoms, on the other hand, showed that reflection at T1, but not rumination, was associated with higher levels of avoidance symptoms at T2.

When focusing on the correlation results concerning rumination, this study is in agreement with previous studies using the RRQ (e.g. Boyraz & Efstathiou, 2011; Jones et al., 2009). We also expected rumination to predict higher distress over time. The correlations indicated that rumination at T1 was associated with higher distress at T2, but rumination was not a significant predictor in the regressions when controlling for T1 distress. Distress at T1 and T2 were highly correlated, and because rumination was correlated with T1 distress, controlling for these measures may have left little variance to be explained by rumination.

When focusing on the correlation results, reflection appeared to be a more neutral form of self-focused thoughts. However, the finding that reflection was associated with higher avoidance symptoms over time questions the neutrality of reflection. The negative impact of reflection over time is especially notable because reflection was operationalized by a measure which clearly focuses on positive aspects of reflection. Although the present results require replication before firm conclusions can be drawn, a few speculations regarding the maladaptive effects of reflection will be considered. Reflection has been argued to be adaptive because it is associated with active coping (Marroquin, Fontes, Sciletta, & Miranda, 2010). While this may be an advantage for everyday negative events, it may not be so for more severe events, like cancer, where active coping is not likely to

change the outcome (Stanton et al., 2007). Still the literature suggests that active coping is associated with better adjustment in cancer patients (Stanton et al., 2007). Another possibility is that the openness towards emotions captured by reflection backfires in the context of a severe stressor, like cancer. Thus, the intense emotions experienced by highly reflecting individuals may over time become unbearable and elicit avoidance responses.

Generally, the present study invites consideration of whether any forms of habitual self-focused thoughts (as captured by trait measures) are adaptive, since both rumination and reflection were associated with higher distress. The characteristics of maladaptive versus adaptive self-focused thoughts are debated, including abstract versus concrete, emotionally immersed versus distanced, evaluative versus mindful (e.g. Kross, Ayduk, & Mischel, 2005; Watkins, 2008). The reflection scale of the RRQ used in the present study, although developed to measure adaptive self-focused thoughts, does not clearly map onto these dimensions, which may also explain the lack of clear evidence for positive effects of reflection. Another possibility is that the tendency to experience self-focused thoughts is a general trait, which may turn adaptive or maladaptive depending on the internal milieu of the individual, like positive versus negative self-schemata and moods (Watkins, 2008). The prolonged negative emotions associated with having cancer would thus make self-focused thoughts maladaptive regardless of other characteristics such as abstractness, immersion and evaluative focus.

If the present results are replicated in a larger sample, interventions may benefit from targeting the habitual use of self-focused thoughts. One intervention which aims at reducing self-focused thoughts is mindfulness training and a recent review shows that mindfulness is effective in reducing distress in cancer patients (Piet, Würtzen, & Zachariae, 2012).

Limitations and conclusion

There are some limitations in the present study. First, rumination and reflection were assessed at the general level, which may not correspond to day-to-day thoughts about having cancer. Second, the present findings may not generalize to other types of negative events and self-focused thoughts. Third, the time between the first measurement and the negative event was not constant across participants, but varied from 1-7 months. Although this did not affect the present results, statistically controlling for a variable is inferior to actual control and future studies should attempt to keep the time since the negative event constant. This is important because responses to negative events have been shown to vary as function of time in other studies (Stanton et al., 2007). It is possible that rumination and reflection may show different relationships with distress according to the stage and severity of the illness. That is reflection may be more adaptive during stages where actively seeking out information and changing daily routines (which may be facilitated by reflection) are likely to make a difference. Although experiencing relapse of cancer did not affect the present results, future studies need to address whether relapse, illness stage and severity moderates the relationship between reflection and distress. Fourth, we lack information on psychological treatment which could have reduced distress as well as information on whether T2 non-responders were more severely affected by their cancer disease, both of which may influence the relations between rumination, reflection and distress at T2. Finally, our participants may not be representative of all patients eligible for inclusion, which also questions the representativeness of the results.

In conclusion, the correlations indicated that rumination was related to more distress, whereas this was not the case for reflection. However, when examining the prospective data, reflection predicted higher levels of avoidance symptoms over time, whereas this was

not the case for rumination when adjusting for baseline levels of avoidance. This could be taken to suggest that reflection, in the context of a cancer diagnosis, and perhaps other serious life events, may not be adaptive.

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Footnotes

1. RRQ, rumination: At T1, 8 participants had missing data with an average of 1.38 missing items (range 1-2). RRQ, reflection: At T1, 5 participants had missing data with 2 participants having all items missing (and thus were not included in analyses) and the remaining 3 participants all having 1 missing item. At T2, no participants had missing data for the rumination or the reflection subscale of the RRQ. IES, intrusion subscale: At T1, 5 participants had missing data for the IES intrusion subscale with an average of 4 missing items (range 1-7; 3 participants were not included in analyses because of too many missing items). IES, avoidance subscale: At T1, 7 participants had missing data with an average of 4 missing items (range 1-8; 3 participants were not included in the analyses because of too many missing items). At T2, 1 participant had 1 missing item for the IES intrusion subscale and 1 participant had 1 missing data point for the IES avoidance subscale. BDI-II: At T1, 6 participants had missing data with 1 participant missing 11 items (and were thus not included in analyses) and the remaining 5 participants missing between 1-6 items (average 2.8 items). At T2, 4 participants had missing data for the BDI-II with an average of 3.75 missing items (range 1-10). Thus, more replacement of missing values was needed for the T1 data.
2. Because the results for reflection were in disagreement with expectations, we examined the relation between reflection and an alternative measure of distress. As a part of the study participants described the event where they received the cancer diagnosis at both T1 and T2. We counted positive and negative affect words in the descriptions the participants made of the event where they received the diagnosis. We coded this as "0" for no mentioning of positive/negative words and "1" for the

mentioning of positive/negative affect words. The agreement between the two independent co-raters was high ($\kappa = 0.80$). We analyzed these data in two regression analyses using reflection at T1 to predict mentioning of positive or negative affect in T2 descriptions while controlling for mentioning of positive or negative affect words in T1 descriptions. For negative affect words, the overall model was significant ($F(2, 48) = 8.84, p < 0.05$). However, reflection did not reach significance, although the direction of the relationship indicated that more reflection was associated with higher likelihood of mentioning negative affect words ($\beta = 0.16, p > 0.05$). For positive affect words, the overall model was significant ($F(2, 48) = 6.38, p < 0.05$). Reflection was associated with less likelihood of mentioning positive affect words at T2, while controlling for T1 positive affect words ($\beta = -0.26, p = 0.05$). We believe that these additional analyses further support the idea that reflection is associated with reduced well-being over time in the present study.

Table 1

Correlations and means for rumination, reflection, intrusive symptoms, avoidance symptoms and depressive symptoms at time 1 and 2.

Variable	2	3	4	5	6	7	8	9	10	<i>M (SD)</i>
1. Rumination, T1	.16	.37*	.46*^a	.42*^b	.66*	-.03	.32*	.30*	.32*	20.49 (8.95)(*)
2. Reflection, T1		.11	.01^a	-.01^b	.19	.71*	.24(*)	.21	-.001	22.66 (6.83)
3. Intrusion, T1			.48*	.59*	.18	-.14	.65*	.48*	.30*	7.95 (4.92)
4. Avoidance, T1				.50*	.17	-.33*	.19	.61*	.31*	9.52 (5.23)
5. Depression, T1					.37*	-.15	.46*	.55*	.74*	9.27 (5.85)*
6. Rumination, T2						.30*	.37*	.27*^c	.50*^d	22.50 (8.75)
7. Reflection, T2							.13	-.09^c	.04^d	22.06 (6.74)
8. Intrusion, T2								.58*	.43*	7.74 (5.61)
9. Avoidance, T2									.40*	8.56 (5.16)
10. Depression, T2										7.81 (5.48)

Note. * $p < 0.05$, (*) $p < 0.10$. Correlations between rumination, reflection and distress in bold. For correlations at T1, $N = 63-66$, for correlations at T2, $N = 53-54$. Superscript letters a-d denote significant differences between pairs of correlation (i.e. ^a denotes that the correlation between T1 rumination and T1 avoidance is significantly different from the correlation between T1 reflection and T1 avoidance). Means and SD are displayed only for participants who completed both T1 and T2 measures. T1 means marked with * or (*) denotes differences between T1 and T2 means.

Table 2

Multiple regression with T1 measures of rumination and reflection predicting T2 measures of intrusive symptoms, avoidance symptoms and depressive symptoms controlling for the T1 measure of distress matching the dependent variable

Predictor variable	T2 Intrusion		T2 Avoidance		T2 Depression	
	β	sr^2	β	sr^2	β	sr^2
Age	-.13	0.02	-.05	0.001	-.13	0.01
T1 depression or intrusion or avoidance	.56*	0.30	.62*	0.29	.69*	0.37
Rumination	.08	0.01	-.03	0.0005	.07	0.0002
Reflection	.12	0.01	.25*	0.06	-.02	0.004

Note. * $p < 0.05$. For the regression predicting T2 depression we controlled for T1 depression (and not T1 intrusion and avoidance). Similarly, in the regression predicting T2 intrusion we controlled for T1 intrusion (and not T1 depression and avoidance) and in the regression predicting T2 avoidance we controlled for T1 avoidance (and not T1 depression and intrusion). Sr^2 denotes the squared semipartial correlation coefficient which is a measure of the proportion of variance in the dependent variable explained by the specific predictor variable.