

Lower levels of trust in one's physician is associated with more distress over time in more anxiously attached individuals with cancer



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ABSTRACT

Objective: In the present study, we investigated individual differences in the outcome of patient–physician trust when confronted with cancer from an attachment theoretical perspective. We expected that lower levels of trust are associated with more emotional distress and more physical limitations within the first 15 months after diagnosis, especially in those who score relatively high on attachment anxiety. No such association was expected for more avoidantly attached individuals.

Method: A group of 119 patients with different types of cancer (breast, cervical, intestinal and prostate) completed questionnaires concerning trust (short version of the Wake Forest Physician Trust Scale) and attachment (Experiences in Close Relationship scale Revised) at 3 months after diagnosis. Emotional distress (Hospital Anxiety and Depression Scale) and physical limitations (physical functioning subscales of the European Organization for Research and Treatment of Cancer, Quality of Life Questionnaire-C30) were assessed at 3, 9 and 15 months after diagnosis. To test the hypotheses, multiple hierarchical regression analyses were performed.

Results: Lower levels of trust were associated with more emotional distress and more physical limitations at 3, 9 and 15 months after diagnosis in more anxiously attached patients, but not in less anxiously attached patients.

Discussion: These results indicate an attachment-dependent effect of trust in one's physician. Explanations and clinical implications are discussed.

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Trusting one's physician when confronted with cancer is an important factor for a patient's well-being [1]. People with cancer are confronted with many uncertainties, have to deal with radical treatment and have to make difficult and far-reaching decisions. Within such a context, it is important to be able to rely and depend on one's physician. It has been found that lower levels of trust in one's physician are associated with more emotional distress and less adherence to medical advice [2]. However, the impact of lack of trust in one's physician may vary for different people with cancer. In the present study, we show that attachment theory may offer a useful framework for understanding individual differences in the outcome of patient–physician trust. This theory describes the evolutionary and developmental origins of adult patterns in how people perceive, feel and act within close interpersonal relationships [3–5].

According to attachment theory, people show differences in their needs and willingness to rely and depend on others, as a consequence

of early childhood experiences with caregivers. These experiences result in attachment representations that shape future expectations, needs and fears regarding dependency and autonomy [4]. In adulthood, attachment representations have been conceptualized as a set of mental states concerning *anxiety* about rejection and abandonment and *avoidance* of intimacy and interdependence [6–8].

People who score relatively low on both dimensions are said to be secure [9]. Secure attachment is a cluster of attitudes and emotional states that includes feeling confident about the availability and responsiveness of others coupled with confidence about one's own ability to deal with stressors [10]. In contrast to more insecurely attached individuals, securely attached individuals have a broad range of different coping skills they have learned to mobilize in a flexible and considered way [11]. Consequently, while lower levels of trust in one's physician may be upsetting for more securely attached patients, they are likely to be able to cope with it in an active and problem-solving way.

Attachment anxiety is a cluster of attitudes and emotional states that include an exaggerated desire for closeness and intimacy together with a high fear of rejection and abandonment [12]. In stressful situations, people high on attachment anxiety may view themselves as

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unable to deal with the stressors and emotion regulation and self-soothing may fail. In a medical context, physicians may notice clingy and support-generating behaviors of anxiously attached patients, such as reports of high levels of emotional distress and physical limitations [13]. These behaviors may be seen as an attempt to elicit care that result from a need to rely and depend on others for comfort and reassurance, which may be consistent across relationships and over time [14]. More anxiously attached individuals have been found to report more (unexplained) medical and psychological symptoms than secure and avoidant individuals, and to overuse the health care system [15–18]. Due to their high level of dependency on others, lower levels of trust in one's physician may be associated with the report of more distress and physical limitations, especially in more anxiously attached individuals.

Attachment avoidance is a cluster of attitudes and feeling states that includes an enduring and compulsive tendency to be self-reliant and independent, while denying the importance of close relationships [19,20]. These people tend to overregulate their emotions, show little feelings and use rationalization or intellectualization to handle stressful situations in order to minimize the need to rely on others [19,21]. Due to their high level of independency, lower levels of trust in one's physician may not result in more distress in more avoidantly attached individuals.

In a previous study making use of a categorical measure of attachment, namely, the Attachment Style Interview [22], we showed in the same patient sample that insecurely attached patients reported less trust in their physician than securely attached patients [23]. The effect sizes were small to medium, indicating that even insecurely attached patients reported relatively high levels of trust. Nevertheless, substantial differences in trust could be detected within different attachment subgroups. In the present study, we use a continuous measure of attachment, the Experience in Close relationship questionnaire [6,7,24]. Furthermore, in the present study, we go one step further by investigating a potential moderating effect of attachment on the associations between level of trust in one's physician on the one hand and emotional distress and physical functioning on the other hand. Although categorical data may be appealing in a clinical setting, a dimensional approach as applied in the current study has theoretical and analytical advantages [25]. That is, adult attachment security is more likely to be a variable on which people differ in degree than in type. Moreover, categorical data introduce problems concerning power, which can only be avoided by large samples and effect sizes [26]. Since only small differences in trust can be expected, as was shown by Holwerda et al. [23] and the aim of the present study is theoretically driven, a dimensional measure is preferred.

In the present study, we hypothesized an attachment-dependent effect of trust in one's physician. We expected that lower levels of trust in one's physician are associated with more emotional distress (Hypothesis 1) as well as the report of more physical limitations (Hypothesis 2) within the first 15 months after diagnosis, especially in those people who score relatively high on attachment anxiety. Moreover, attachment avoidance was not expected to moderate the association between trust in one's physician on the one hand and emotional distress and physical functioning on the other hand. Thus, we expect that decreased trust in the physician will be associated with increased physical and emotional distress and that this association will be strengthened by anxious, but not by avoidant insecurity.

1. Method

1.1. Patients

This study is part of a larger longitudinal study investigating the role of attachment style in adaptation to cancer among people recruited from three hospitals in the Netherlands [23]. The study has been approved by a medical ethical committee in the Netherlands. Individuals were eligible if they were 30 to 75 years old, had a first

diagnosis of cancer (i.e., breast, cervical, gastrointestinal or prostatic cancer) within the past 3 months, had an expected survival of at least 1 year and were able to speak and comprehend Dutch. Physicians informed individuals about the study and its requirements. Interested individuals received a detailed information letter and were informed that the information provided would be treated confidentially and that they could withdraw from the study at any time.

1.2. Measures

Respondents completed a questionnaire at three time points, that is, 3, 9 and 15 months after diagnosis. We used their ratings of trust in their physician and attachment representations at the first assessment and the score of distress and physical functioning at all three assessments.

1.2.1. Trust

Individuals' trust in their physician was measured by a short version of the Wake Forest Physician Trust Scale [27,28], assessing trust in the physician who was most involved in the treatment during the past months. The five items administered were as follows: "My physician sometimes puts his/her own interests first," "My physician is extremely thorough and careful," "I completely trust my physician's decisions about which treatments are the best for me," "My physician is totally honest in telling me about all of the different treatment options available for my condition," and "All in all, I have complete trust in my physician." Items were scored on a scale from 1 (totally agree) to 5 (totally disagree). After rescaling the positive items, higher scores indicate more trust. We calculated mean scores with a possible range of 1 (no trust) to 5 (full trust) for each patient. Cronbach's alpha was .86.

1.2.2. Attachment representations

Attachment anxiety and attachment avoidance were measured with the Experiences in Close Relationship scale Revised (ECR-R), a continuous measurement of attachment style [6,7,24]. The ECR-R comprises 36 items to assess attachment anxiety (18 items) and attachment avoidance (18 items). Items were rated on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree." The present data showed good internal consistency for both subscales, with Cronbach's alphas of .91 and .88 for attachment anxiety and attachment avoidance, respectively.

1.2.3. Distress

Participants completed the Hospital Anxiety and Depression Scale [29], a validated 14-item self-report scale assessing feelings of anxiety and depressive symptoms over the last week on a 4-point scale (0–3, a higher score representing more distress) [30,31]. Cronbach's alpha for the total score was .93, .92 and .90 at 3, 9 and 15 months after diagnosis, respectively.

1.2.4. Physical limitations

The Physical Functioning subscales of the European Organization for Research and Treatment of Cancer, Quality of Life Questionnaire-C30 [32] was administered to assess physical functioning. The Physical Functioning scale consists of five items referring to the past week that can be scored on a 4-point scale ranging from 1 ("not at all") to 4 ("very much"). Item examples are "are you able to make a long walk" and "do you need help with your personal care?" A lower score indicates that a person states he or she is limited, not able to take care of him or herself and needs help from others. The sum of the subscale was transformed into a score between 0 and 100. Cronbach's alpha was .74, .74 and .77 at 3, 9 and 15 months after diagnosis, respectively.

1.2.5. Patient characteristics and disease-specific variables

Cancer type was extracted from the patients' medical files. Gender, age, educational level, treatment type and presence of metastases at

the first assessment (yes or no) were self-reported by the patients. Presence of comorbidity was assessed by presenting a list with possible options (such as diabetes, kidney failure, high blood pressure) and the possibility to name a disease that was not listed.

1.3. Statistical analysis

1.3.1. Preliminary analysis

The association between demographics (gender, age, relationship status, education level) and medical data (cancer type, metastasis, being in treatment at 3 months and comorbidity such as diabetes, hypertension, arthritis and asthma) on the one hand and distress and physical limitations at 3 months after diagnosis on the other hand were explored to determine which variables should be included as covariates for further analysis. Pearson correlations (age), independent *t*-tests (gender, relationship status, metastasis, comorbidity, being in treatment at 3 months after diagnosis) and one-way analyses of variance (ANOVAs; education level, cancer type) were used.

1.3.2. Main analysis

To test the hypotheses, multiple hierarchical regression analyses were performed with either emotional distress (Hypothesis 1) or physical limitations (Hypothesis 2) at 3, 9 and 15 months after diagnosis as a dependent variable. Although the different assessment points cannot be considered independent, these repeated analyses are suitable for testing the robustness of the hypotheses.

After entering covariates, trust in one's physician, attachment anxiety and attachment avoidance were entered in linear regression analyses. Next, in order to investigate the moderating role of attachment, two-way interaction terms with trust were computed. Also the two-way interaction of attachment anxiety by attachment avoidance and the three-way interaction of trust by attachment anxiety by attachment avoidance were investigated but not found to be significant. Therefore, these interaction terms were excluded from further analyses.

For the two-way interactions (trust with attachment anxiety or attachment avoidance), the product of the centered scores (i.e., centered around zero) on the component variables of the interaction terms was used to minimize multicollinearity [33]. An additional advantage of not categorizing is that the component variables of the interaction term remain dimensional, which limits the loss of power and prevents an overestimation of the results [34]. As a visual aid to determine the direction of the interactions between trust and attachment, the regression lines for the association between trust and emotional and physical distress were drawn at two levels of attachment anxiety and attachment avoidance (mean \pm 1 S.D.).

2. Results

2.1. Preliminary analysis

A total of 553 individuals diagnosed with cancer were informed on this study. Of those, 119 (22%) decided to participate, provided informed consent and completed the questionnaires presented in this study. Participants were mainly female (71%), mean age was 59 years (S.D.=9.32), and the majority was involved in a relationship (80%). Sample characteristics (sociodemographic and medical variables) are further described in Table 1.

Correlations between the main study variables are presented in Table 2. Trust was not found to be correlated with attachment anxiety or with attachment avoidance. Moreover, distress and physical functioning scores at the different time points were correlated, showing some stability over time, with a range between 0.52 and 0.80. Also, the two attachment scales were correlated, sharing 51% of the variance.

Age was found to be associated with emotional distress at 3 months after diagnosis ($r=0.184, P<.05$). A one-way ANOVA showed

Table 1
Sample characteristics ($n=119$)

	<i>n</i> (%)
Gender	
Female	84 (71)
Age	
Mean (S.D.)	59 (9.32)
Marital status	
Relationship	95 (80)
No relationship	24 (20)
Educational level	
Lower-level vocational school	24 (20)
Secondary education/advanced-level vocational school	56 (47)
Higher or postsecondary/university education	38 (32)
Cancer type	
Prostate cancer	32 (27)
Breast cancer	72 (61)
Intestinal cancer	7 (7)
Cervical cancer	8 (6)
Metastasis present at 3 months	
Yes	20 (17)
Missing	8 (7)
In treatment at 3 months	
Yes	82 (68)
Comorbidity	
Yes	80 (67)

that cancer type was significantly associated with higher levels of distress [$F(3)=4.848, P<.005$] and with lower levels of physical functioning [$F(3)=9.491, P<.001$] at 3 months after diagnosis. Post hoc analysis further indicated that cervical cancer patients reported significantly higher levels of emotional distress and lower levels of physical functioning than did all other patients. Women were found to report higher levels of distress and less physical functioning than did men at 3 months after diagnosis, with mean differences of 4.34 [$t(117)=3.252, P=.001$] and 11.825 [$t(117)=3.747, P<.001$], respectively. Thus, at 3 months, women in general, but especially those with cervical cancer, reported relatively high levels of emotional and physical distress. Moreover, comorbidity was associated with lower physical functioning at 3 months after diagnosis, with a mean difference of 7.585 [$t(117)=2.396, P<.05$]. Being in treatment and the presence of metastasis were not found to be associated with emotional distress or physical functioning. Also, marital status and education level were not found to be associated with emotional distress or physical functioning and excluded from further analyses.

2.2. Main analysis

2.2.1. Trust, attachment and emotional distress

Hierarchical regression analysis showed that after controlling for covariates, the interaction term of trust with attachment anxiety ($B=-5.99, P<.005$) and of trust with attachment avoidance ($B=5.59, P<.005$) explained 24% of the variance in distress at 3 months after diagnosis [$\Delta F(2,109)=6.37, P<.005$]. Fig. 1 shows that a lower level of trust was associated with more emotional distress in more anxiously attached patients, but not in less anxiously attached individuals. Fig. 2 shows that a lower level of trust was associated with more distress in less avoidantly, but not in more avoidantly attached individuals. The interaction term of trust and attachment anxiety was also found to explain distress at 9 and 15 months after diagnosis, explaining 23% and 26% of the variance, respectively (see Table 3).

2.2.2. Trust, attachment and physical limitations

Hierarchical regression analysis showed that after controlling for covariates, attachment anxiety ($B=-10.36, P=.001$) and the interaction term of trust with attachment anxiety ($B=12.97, P<.005$) explained 26% of the variance in distress at 3 months after

Table 2
Correlations for the variables under study

		Trust	Attachment anxiety	Attachment avoidance	Distress			Physical functioning		
					3 months	9 months	15 months	3 months	9 months	15 months
Trust			-.06	-.10	-.19*	.21*	-.12	.10	.15	.00
Attachment anxiety				.72**	.28**	.36**	.37**	-.34**	-.19*	-.16
Attachment avoidance					.30**	.33**	.39**	-.25**	-.15	-.19*
Distress	3 months					.63**	.57**	-.44**	-.39**	-.22*
	9 months						.80**	-.46**	-.59**	-.41**
	15 months							-.45**	-.55**	-.47**
Physical functioning	3 months								.61**	.52**
	9 months									.69**
	15 months									
	Mean (S.D.)	4.23 (0.73)	1.74 (0.61)	2.24 (0.70)	6.61 (6.89)	6.07 (6.67)	4.67 (5.52)	86.65 (16.53)	88.46 (13.10)	89.91 (14.57)

* $P < .05$.
** $P < .01$.

diagnosis [$F(2,109)=4.71, P=.01$]. This interaction was plotted in Fig. 3 showing that lower levels of trust were associated with worse physical functioning in more anxiously attached patients, but not in less anxiously attached patients. The interaction term of trust and attachment anxiety ($B=10.77, P<.005$) was also found to explain 14% of the reported physical limitations at 9 months after diagnosis [$F(2,109)=4.33, P<.05$]. No such association was found for physical limitations at 15 months after diagnosis or for the interaction term of trust with attachment avoidance (see Table 4).

3. Discussion

The present study showed that when confronted with cancer, a lower level of trust in one's physician was associated with more emotional distress as well as more physical limitations within the first 15 months after diagnosis in more anxiously attached patients, but not in less anxiously attached patients. Overall, there was little evidence for a moderating effect of attachment avoidance, meaning that the associations between trust and distress and physical limitations did not depend on attachment avoidance. These results are in accordance with attachment theory which suggests that the impact of lower levels of trust may differ between individuals, as people may differ in their need and willingness to rely on others for support and care [35–37].

The findings regarding attachment anxiety may be explained in several ways. First, in the context of cancer, the feeling that one may

not be able to fully count on one's physician may activate the stress-response system. This may be especially true for more anxiously attached individuals, as they feel unable to deal with stressors themselves and need to rely on others [12]. With the overactivation of the stress-response system (e.g., activation of the sympathetic nervous system and the release of stress hormones such as epinephrine, norepinephrine and glucocorticoids), physical and emotional distress may increase dramatically.

Moreover, there is a complex interaction between trust, attachment, distress and the hormone oxytocin [38–42]. Although much is not yet understood, it seems clear that more insecurely attached individuals (i.e., people scoring higher on attachment anxiety and/or attachment avoidance) show lower levels of oxytocin and that both trust and oxytocin have a stress dampening and anxiolytic effect [42]. Consequently, the impact of lower levels of trust on the stress-response may be buffered by higher levels of oxytocin in more securely attached individuals, while the impact of lower levels of trust may be exacerbated by less oxytocin in more insecurely attached patients. This may be true for people scoring higher on attachment anxiety as well as attachment avoidance. However, in contrast to more anxiously attached individuals, more avoidantly attached individuals may not feel distressed and therefore report not to be distressed. These people respond to stressors with emotional inhibition and cognitive distancing (e.g., intellectualization and rationalization) which prevents emotional distress to enter awareness. This

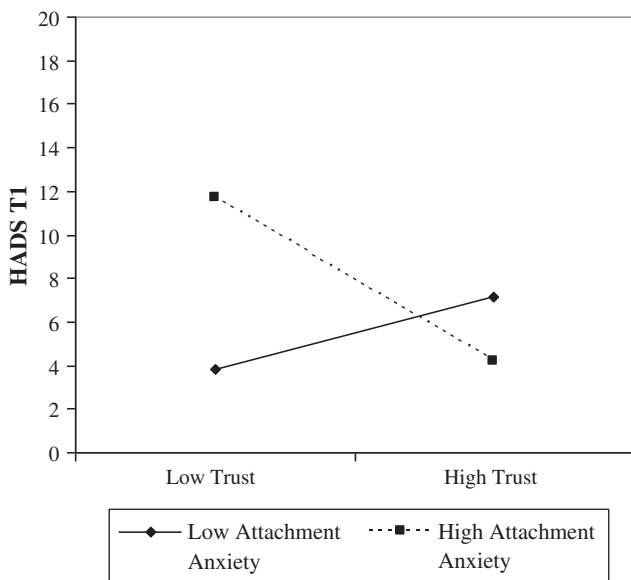


Fig. 1. Interaction effect of trust and attachment anxiety on emotion distress.

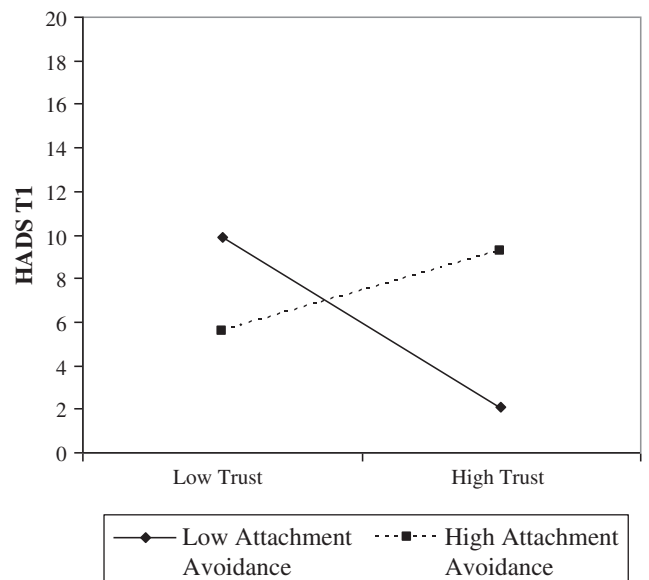


Fig. 2. Interaction effect of trust and attachment avoidance on emotion distress.

Table 3
Distress explained by trust and attachment anxiety

	Distress		
	3 months	9 months	15 months
Step 1 Age	−0.07 (0.07)	−0.13 (0.07)	−0.13 (0.05)
Gender	3.09 (3.65)	1.96 (3.56)	3.14 (2.88)
Cervical	0.40 (3.70)	0.40 (3.61)	2.14 (2.92)
Comorbidity	1.09 (1.25)	0.76 (1.22)	0.80 (0.99)
Step 2 Trust	−1.38 (.81)	−1.56 (.79)	−0.40 (0.64)
Attachment anxiety	2.13 (1.32)	3.66 (1.29)	2.47 (1.05)*
Attachment avoidance	1.00 (1.19)	0.78 (1.16)	1.66 (0.94)
Step 3 Trust×Attachment anxiety	−5.99 (1.88)**	−4.47 (1.83)**	−3.60 (1.48)*
Trust×Attachment avoidance	5.59 (1.66)**	2.49 (1.62)	1.68 (1.31)
ΔR ²	0.24**	0.23*	0.26*

Unstandardized regression coefficients (S.E.) of the final step are presented.

* $P < .05$.

** $P < .01$.

Table 4
Physical functioning explained by trust and attachment anxiety

	Physical functioning		
	3 months	9 months	15 months
Step 1 Age	0.12 (0.16)	−0.03 (0.14)	−.13 (0.17)
Gender	−13.39 (8.59)	−12.87 (7.38)	−8.42 (8.56)
Cervical	−4.46 (8.71)	−6.23 (7.48)	−5.40 (8.67)
Comorbidity	−5.70 (2.96)	−2.96 (2.54)	−5.83 (3.00)
Step 2 Trust	1.68 (1.90)	1.59 (1.63)	0.23 (1.91)
Attachment anxiety	−10.36 (3.12)***	−4.21 (2.68)	−1.87 (3.11)
Attachment avoidance	1.13 (2.80)	0.38 (2.40)	−2.70 (2.79)
Step 3 Trust×Attachment anxiety	12.97 (4.42)**	10.77 (3.79)**	6.99 (4.40)
Trust×Attachment avoidance	−5.51 (3.91)	−4.03 (3.35)	−1.85 (3.90)
ΔR ²	0.28**	14*	0.07

Unstandardized regression coefficients (S.E.) of the final step are presented.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

may, however, not correspond with their internal state as they may show considerable biological distress (e.g., increased blood pressure, heart rate variability) [10,43,44]. Future studies should investigate whether oxytocin does play a role in the level and outcome of patient–physician trust.

Third, more anxiously attached individuals experience difficulty with affect modulation and self-soothing as they may find it difficult to maintain a realistic perspective on their situation [45]. Other people, and especially one's physician, are needed as external regulators of negative emotions by providing alternative and more realistic perspectives [13]. Consequently, when one feels that one's physician may not be completely trustworthy, he or she may no longer function as an appropriate external regulator resulting in higher levels of distress over time.

Moreover, in the present study, a lower level of trust was found to be associated with worse physical functioning in especially more anxiously attached individuals. This is in line with the idea that more anxiously attached individuals may focus more on physical complaints and report more limitations in an attempt to guarantee the help of others as much as possible [46]. This tendency to be hyper-vigilant and to amplify physical limitations in order to maximize

responsiveness may be strengthened when one feels that one of the figures one depends on (i.e., one's physician) is not completely available. Alternatively, trust in physicians may be more salient and important for people with greater physical dysfunction and therefore mistrust may be reported more readily by anxiously attached individuals in this circumstance.

In the study by Holwerda et al. [23], a significant association between attachment and trust was found using a categorical investigator-based interview measure of attachment (i.e., Attachment Style Interview) in the same patient sample as used in the present study. On first sight, no such association was found in the present study using a dimensional, self-report measure of attachment (i.e., ECR-R). However, further analyses showed that the interaction term of attachment anxiety by attachment avoidance was associated with trust levels [$F(1)=4.37, P < .05$]. In line with the study by Holwerda et al. [23], this result indicates that more securely attached individuals (i.e., scoring relatively low both on attachment anxiety and on attachment avoidance) reported higher levels of trust in their physician than more insecurely attached individuals (scoring relatively high on attachment anxiety and/or high on attachment avoidance). That an association between attachment and trust was found in this patient population using two different attachment measures strengthens these results.

Moreover, in the present study, the correlation between both attachment subscales was remarkably high. The two attachment subscales of the ECR-R were, however, designed to capture two related but distinct constructs. The finding that, despite the high correlation, the effect of trust for people high on attachment anxiety was different from patients high on attachment avoidance supports the distinction between both scales.

For the interpretation of our findings, it is important to keep in mind a number of limitations. One limitation is the relatively low response rate. We thoroughly informed eligible patients about the time and effort participation would take in order to retain patients in the study during follow-up. A drawback may have been that a considerable number of patients expected to be burdened too much by the requirements of the study and therefore did not give informed consent. Furthermore, patients who trusted their physician more may have been more inclined to participate. This may have resulted in a selection bias of patients who expected not to be burdened too much by participation and reported relatively high trust in their physician. Individuals may also have reported higher levels of trust in their physician due to factors such as social desirability. However, the variance in the trust scores was large enough to detect significant associations in the expected direction.

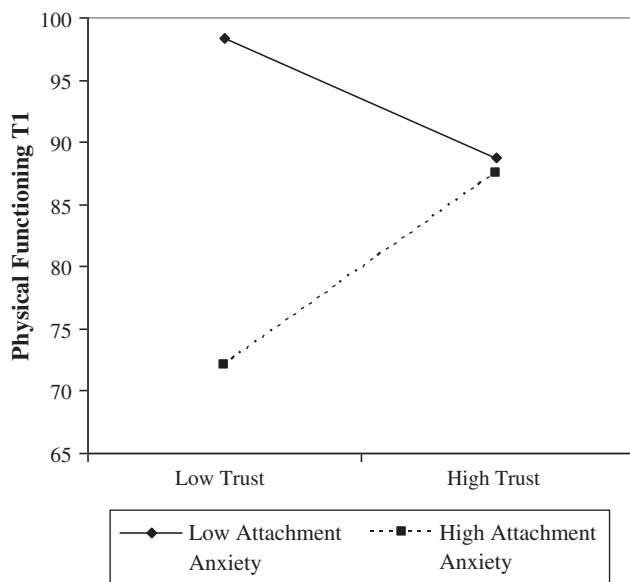


Fig. 3. Interaction effect of trust and attachment anxiety on physical functioning.

We used the shortened version of the questionnaire measuring trust. We did not want to burden patients with more items than necessary to obtain an adequate indication of patients' trust in their physician. Although the shortened version of the questionnaire covered fewer dimensions of trust, patients' trust has previously been found to behave as a holistic construct, and different dimensions correlate strongly with patients' overall degree of trust [28,47]. Therefore, we do not think that the use of a shortened version has influenced our outcomes.

A clear strength is that we are among the first to empirically examine whether lower levels of trust in one's physician when confronted with cancer were associated with more emotional distress and physical limitations in more anxiously and more avoidantly attached individuals. Also, we have employed a multicenter and longitudinal design and included patients with different types of cancer, which increases the generalizability of our results. Still, caution is required regarding the interpretation of the direction of the relationships found.

The present findings may have clinical implications. First, the present results indicate that reliable and responsive care by a physician is important, especially for more anxiously attached patients. Failing to provide such care may result in clingy and support-generating behaviors, which may require even more time of the physician who already works under severe time constraints to down-regulate the distress levels [13]. Also, the presence of an intimate other during a medical appointment may offer a secure base, which may limit the impact of lower levels of trust [48,49]. The finding that attachment avoidance did not impact the effect of trust in one's physician does not mean that the quality of the patient–physician relationship has no impact on more avoidantly attached patients. They may, however, show their discomfort behaviorally (e.g., non-adherence to the medical regimen) rather than emotionally [35]. Whether this is the case should be tested in future studies.

References

- [1] Mechanic D, Meyer S. Concepts of trust among patients with serious illness. *Soc Sci Med* 2000;51(5):657–68.
- [2] Hillen MA, de Haes HCJM, Smets EMA. Cancer patients' trust in their physician – a review. *Psycho-Oncology* 2011;20(3):227–41.
- [3] Bowlby J. Attachment. New York: Penguin Group; 1969.
- [4] Bowlby J. A secure base. Clinical applications of attachment theory. London: Tavistock/Routledge; 1988.
- [5] Bretherton I. The origin of attachment theory: John Bowlby and Mary Ainsworth. *Dev Psychol* 1992;28(5):759–75.
- [6] Bartholomew K, Horowitz LM. Attachment styles among young adults: a test of a four-category model. *J Pers Soc Psychol* 1991;61(2):226–44.
- [7] Brennan KA, Clark CL, Shaver PR. Self-report measurement of adult attachment. An integrative overview. In: Simpson JA, Rholes WS, editors. Attachment theory and close relationships. New York: The Guilford Press; 1998. p. 46–76.
- [8] Crowell JA, Fraley RC, Shaver PR. Measurement of individual differences in adolescent and adult attachment. In: Cassidy J, Shaver PR, editors. Handbook of attachment. theory, research, and clinical applications. New York: The Guilford Press; 1999. p. 434–65.
- [9] Shaver PR, Mikulincer M. Attachment theory and research: resurrection of the psychodynamic approach to personality. *J Res Pers* 2005;39:22–45.
- [10] Mikulincer M, Shaver PR, Pereg D. Attachment theory and affect regulation: the dynamics, development, and cognitive consequences of attachment-related strategies. *Motiv Emot* 2003;27(2):77–102.
- [11] Schmidt S, Nachtigall C, Wuethrich-Martone O, Strauss B. Attachment and coping with chronic disease. *J Psychosom Res* 2002;53:763–73.
- [12] Mikulincer M. Adult attachment style and affect regulation: strategic variations in self-appraisals. *J Pers Soc Psychol* 1998;75(2):420–35.
- [13] Hunter JJ, Maunder RG. Using attachment theory to understand illness behavior. *Gen Hosp Psychiatry* 2001;23:177–82.
- [14] Stuart SS, Noyes RJ. Attachment and interpersonal communication in somatization. *Psychosomatics* 1999;40(1):34–43.
- [15] Ciechanowski P, Katon WJ, Russo JE, Dwight-Johnson MM. Association of attachment style to lifetime medically unexplained symptoms in patients with hepatitis C. *Psychosomatics* 2002;43(3):206–12.
- [16] Ciechanowski P, Sullivan M, Jensen M, Romano J, Summers H. The relationship of attachment style to depression, catastrophizing and health care utilization in patients with chronic pain. *Pain* 2003;104:627–37.
- [17] Ciechanowski P, Walker EA, Katon WJ, Russo JE. Attachment theory: a model for healthcare utilization and somatization. *Psychosom Med* 2002;64:660–7.
- [18] Taylor RE, Mann AH, Goldberg DP. Attachment style in patients with unexplained physical symptoms. *Psychol Med* 2000;30:931–41.
- [19] Fraley RC, Garner JP, Shaver PR. Adult attachment and the defensive regulation of attention and memory: examining the role of preemptive and postemptive defensive processes. *J Pers Soc Psychol* 2000;79(5):816–26.
- [20] Maunder RG, Hunter JJ. Assessing patterns of adult attachment in medical patients. *Gen Hosp Psychiatry* 2009;31(2):123–30.
- [21] Mikulincer M, Birnbaum G, Woddis D, Nachmias O. Stress and accessibility of proximity-related thoughts: exploring the normative and intraindividual components of attachment theory. *J Pers Soc Psychol* 2000;78(3):509–23.
- [22] Bifulco A, Moran PM, Ball C, Bernazzani O. Adult attachment style. I: its relationship to clinical depression. *Soc Psychiatry Psychiatr Epidemiol* 2002;37(2):50–9.
- [23] Holwerda N, Sanderman R, Pool G, Hinnen C, Langendijk JA, Bemelman WA, et al. Do patients trust their physician? The role of attachment style in the patient–physician relationship within one year after a cancer diagnosis. *Acta Oncol* 2013;52(1):110–7.
- [24] Fraley RC, Waller NG, Brennan KA. An item response theory analysis of self-report measures of attachment theory. *J Pers Soc Psychol* 2000;78(3):509–23.
- [25] Maunder RG, Hunter JJ. A prototype-based model of adult attachment for clinicians. *Psychodynamic Psychiatry* 2012;40(4):549–73.
- [26] Fraley RC, Waller NG. Adult attachment patterns: a test of the typological model. In: Simpson JA, Rholes WS, editors. Attachment theory and close relationships. New York: The Guilford Press; 1998. p. 77.
- [27] Bachinger SM, Kolk AM, Smets EMA. Patients' trust in their physician-psychometric properties of the Dutch version of the "Wake Forest Physician Trust Scale". *Patient Educ Couns* 2009;76(1):126–31.
- [28] Hall M, Zheng B, Dugan E, Camacho F, Kidd K, Mishra A, et al. Measuring patients' trust in their primary care providers. *Med Care Res Rev* 2002;59(3):293–318.
- [29] Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983;67:361–70.
- [30] Spinhoven P, Ormel J, Sloekers PPA, Kempen GJGM, Speckens AEM, Hemert AM. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychol Med* 1997;27:363–70.
- [31] Vodermaier A, Linden W, Siu C. Screening for emotional distress in cancer patients: a systematic review of assessment instruments. *J Natl Cancer Inst* 2009;101(21):1464–88.
- [32] Aaronson N, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez N, et al. The European Organization for Research and Treatment of Cancer QLQ-C30 – a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst* 1993;85(5):365–76.
- [33] Aiken LS, West SG. Multiple regression: testing and interpreting interactions. California: Sage Publications; 1991.
- [34] Coyne JC, Whiffen VE. Issues in personality as diathesis for depression. The case of sociotropy-dependency and autonomy–self-criticism. *Psychol Bull* 1995;118(3):358–78.
- [35] Ciechanowski P, Katon WJ, Russo JE, Walker EA. The patient-provider relationship: attachment theory and adherence to treatment in diabetes. *Am J Psychiatr* 2001;158(1):29–35.
- [36] Mikulincer M. Attachment working models and the sense of trust: an exploration of interaction goals and affect regulation. *J Pers Soc Psychol* 1998;74(5):1209–24.
- [37] Thompson D, Ciechanowski P. Attaching a new understanding to the patient–physician relationship in family practice. *J Am Board Fam Pract* 2003;16(3):219–26.
- [38] Buchheim A, Heinrichs M, George C, Pokorny D, Koops E, Henningsen P, et al. Oxytocin enhances the experience of attachment security. *Psychoneuroendocrinology* 2009;34(9):1417–22.
- [39] Buchheim A, Koops E, George C, Pokorny D, Heinrichs M, Guendel H. Effect of oxytocin on increased sensation of attachment safety. *Nervenarzt* 2007;78:296.
- [40] Campbell A. Oxytocin and human social behavior. *Personal Soc Psychol Rev* 2010;14(3):281–95.
- [41] De Dreu CKW. Oxytocin modulates the link between adult attachment and cooperation through reduced betrayal aversion. *Psychoneuroendocrinology* 2012;37(7):871–80.
- [42] Lee H, Macbeth AH, Pagani JH, Young III W Scott. Oxytocin: the great facilitator of life. *Prog Neurobiol* 2009;88(2):127–51.
- [43] Bateman AW, Fonagy P, editors. Handbook of mentalization in mental health practice. Arlington: American Psychiatric Publishing Inc.; 2012.
- [44] Maunder R, Lancee W, Nolan R, Hunter J, Tannenbaum D. The relationship of attachment insecurity to subjective stress and autonomic function during standardized acute stress in healthy adults. *J Psychosom Res* 2006;60(3):283–90.
- [45] Mikulincer M, Florian V. The relationship between adult attachment styles and emotional and cognitive reactions to stressful events. In: Simpson JA, Rholes WS, editors. Attachment theory and close relationships. New York: The Guilford Press; 1998. p. 143–65.
- [46] Shaver PR, Schachner DA, Mikulincer M. Attachment style, excessive reassurance seeking, relationship processes, and depression. *Personal Soc Psychol Bull* 2005;31(3):343–59.
- [47] Hall M, Dugan E, Zheng B, Mishra A. Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? *Milbank Q* 2001;79(4):613.
- [48] Collins CA, Feeney BC. A safe haven: an attachment theory perspective on support seeking and caregiving in intimate relationships. *J Pers Soc Psychol* 2000;78(6):1053–73.
- [49] Feeney BC, Collins CA. Interpersonal safe haven and secure base caregiving in adulthood. In: Rholes WS, Simpson JA, editors. Adult attachment theory, research and clinical implications. New York: Guilford Press; 2004. p. 300–38.