Supportive Care in Cancer (2019) 27:4317–4325
https://doi.org/10.1007/s00520-019-04744-x

ORIGINAL ARTICLE

Spiritual well-being mediates the association between attachment insecurity and psychological distress in advanced cancer patients

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Received: 21 August 2018 / Accepted: 8 March 2019 / Published online: 18 March 2019

Abstract

Purpose The diagnosis of a terminal disease bears existential challenges, which activate the attachment system. Attachment insecurity, as well as existential resources, such as spiritual well-being, influences patients' extent of psychological distress. Knowledge about the interrelation of these constructs is limited. Based on current research, we assume spiritual well-being to mediate the association of attachment insecurity and psychological distress.

Methods We obtained data from the baseline measurement of a randomized controlled trial in advanced cancer patients. Patients were sampled from the University Medical Centers of Hamburg and Leipzig, Germany. Main outcome measures included the Patient Health Questionnaire (PHQ-9), the Death and Dying Distress Scale (DADDS), the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being Scale (FACIT-Sp), and the Experience in Close Relationships Scale (ECR-M16) for assessing attachment insecurity. We tested the mediation hypothesis with two regression analyses using bootstrapping procedure.

Results A total of 190 patients were included. Spiritual well-being mediated the association of attachment insecurity and depression ($R^2 = 11\%$), as well as death anxiety ($R^2 = 15\%$), in fearful-avoidant attached patients. Neither dismissingly nor preoccupied attached patients differ in terms of spiritual well-being and psychological distress in comparison with secure attached patients.

Conclusion Spiritual well-being plays a relevant role in advanced cancer patient's mental health through mediating the association of attachment and psychological distress. Developing a better understanding of the interdependency of the constructs of spiritual well-being and attachment can help to develop individually tailored advanced cancer care programs and psychotherapeutic interventions.

Trial registration NCT02051660

Keywords Advanced cancer · Attachment · Spiritual well-being · Depression · Death anxiety

Introduction

When diagnosed with a terminal disease, patients face existential challenges, which activate the attachment system [1, 2]. Attachment insecurity has a significant effect on how well patients cope with their disease [3, 4]. In the context of medical illness, it seems to define patient's specific behavioral reactions: anxiously attached patients utilize primary care more frequently and report more somatic symptoms, whereas avoidantly attached patients show little need for help and can hardly bear to be dependent on others [5, 6]. Despite the evidence for this two-dimensional approach [7], a categorical approach has proven to be useful in clinical practice. Based on the two dimensions of anxiety and avoidance, Bartholomew and Horowitz [8] proposed a four-category model, which characterizes four attachment styles based on the individual extent of anxious and avoidant tendencies. While secure individuals show low anxiety and low avoidance, insecure individuals show high anxiety and low avoidance (*preoccupied* attachment), low anxiety and high avoidance (*dismissing* attachment) or both, high anxiety and high avoidance (*fearful*-avoidant attachment).

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Individuals' mental adaptation to existential challenges associated with terminal disease is additionally facilitated by a global sense and specific sources of meaning as well as spiritual well-being [9–11]. In the context of physical disease, spiritual well-being has been defined as an outcome indicating a sense of meaning, peace, and purpose in life, as well as the extent to which patients derive security from their faith and spiritual beliefs [12]. Spiritual well-being was found to be significantly predicted by social relatedness in cancer patients [13]. Correspondingly, Sherman et al. [14] found several dimensions of spirituality and religion, such as spiritual well-being, being associated with patients' capacity to maintain satisfying social roles and relationships. Attachment theory offers an explanation of the individual perception of social support [2], as attachment styles are grounded in the very first experiences with close others and develop in the first years of human life. This is why we assume attachment being one important predictor of how people discover their social surrounding and through that experience spiritual well-being in a certain extent. Loetz et al. [15] state that the same mechanisms of security and exploration defined by Bowlby concerning the construction of relationships elapse in establishing spirituality. Only a secure base within oneself enables patients to explore internal peace or external transcendence. Preliminary findings suggest spiritual well-being to be a protective factor in the relationship between attachment insecurity and psychological distress [16]. There is yet limited knowledge about how the concepts of attachment insecurity and spiritual well-being influence and mediate psychological distress in advanced cancer patients.

We hypothesize that attachment insecurity is associated with a limited capacity to experience spiritual well-being. Taking into account the established association of spiritual well-being and psychological distress, spiritual well-being may mediate the association between attachment insecurity and psychological distress in patients with advanced cancer.

Understanding those specific processes may help us address attachment insecurity and spiritual well-being in psycho-oncological interventions purposefully and thereby to support patients in dealing with their terminal disease.

Material and methods

This study is part of the German Managing Cancer and Living Meaningful (CALM) trial, a bi-center randomized controlled trial (RCT) evaluating the meaning-based psychotherapeutic intervention for advanced cancer patients [17, 18] which was conducted in Hamburg and Leipzig between 2013 and 2016. The CALM trial is an intervention study comparing two active treatment conditions in a single-blind design. Within 6 months, patients either received three to eight sessions of CALM or a usual non-manualized supportive psycho-oncological intervention (SPI). The CALM sessions cover four domains: (1) symptom management and communication with health care providers; (2) changes in self and relations with close others; (3) spirituality, sense of meaning, and purpose; and (4) preparing for the future, sustaining hope, and facing mortality [47]. Data is assessed during screening, at baseline (t0), and 3 (t1) and 6 months (t2). For the present analyses, we obtained data from the baseline measurement of this trial.

The study protocol was approved by local ethics committees in both study centers (Hamburg reference number: PV4435; Leipzig reference number: 143–14–14042014), and the study was registered at clinicaltrials.gov (NCT02051660).

Participants and procedure

We recruited patients at out- and inpatient clinics of both study centers. Trained study research assistants contacted patients with advanced cancer and assessed them for eligibility. According to the CALM study protocol, we included patients who were diagnosed with a malignant solid tumor disease of stages III or IV, who were at least 18 years of age and fluent in German, and who scored ≥ 9 on the PHQ-9 or/and ≥ 5 on the distress thermometer (DT). We invited the patients fulfilling these inclusion criteria to a face-to-face interview where they received further information about the RCT and where exclusion criteria were evaluated (deficits in communication, lack of willingness to attend therapy sessions, acute suicidality, Short Orientation-Memory-Concentration test (SOMC) score < 20, or Karnofsky index score < 70). We also excluded patients in case they received other psychotherapy during the time of the intervention. At the end of the interview, the patients received the baseline questionnaire. All patients provided written informed consent prior to participation and could withdraw their informed consent at all times without having any disadvantage in their medical or psychological treatment. For non-participants, reasons as well as basic demographic and medical characteristics were documented.

A total number of 336 patients were eligible, of which 206 (61%) declared participation by written informed consent. Reasons for non-participation included a high amount of physical and psychological distress (19%) and lack of interest (68%) as well as organizational and other reasons (12%). Of 206 patients who were enrolled in the study, we had 5 (2%) non-responders (declined general condition (3), no further interest (1), start of parallel psychotherapy (1)). Eleven (6%) participants were excluded from analyses due to missing data in the main outcome variables of attachment and spiritual well-being, so that, finally, 190 patients were included in current data analysis.

Measurement

We assessed demographic information through a standardized questionnaire. Medical and treatment-related variables were obtained from patients' medical charts.

The *Short Orientation-Memory-Concentration test* (*SOMC*) [19] is a validated culture-fair instrument assessing orientation, memory, and concentration on seven items. The SOMC scores range from 0 to 28. Scores less than 20 indicate cognitive impairment.

The *Experiences in Close Relationships Scale* (*ECR-M16*) [20, 21] is a self-report instrument assessing patients' experiences in close romantic as well as nonromantic relationships on the subscales anxiety and avoidance. The 16 items are scored on a seven-point Likert scale ranging from 1 (disagree) to 7 (agree), with subscale scores ranging from 8 to 56. In the validation of the German ECR-M16, as well as in the current sample, the instrument showed acceptable to good internal consistency with Cronbach's $\alpha = .81$ (.82 in the current sample) for the subscale of anxiety and $\alpha = .78$ (.77 in the current sample) for the subscale of avoidance (Philipp et al. 2009). According to the patients' scores on these subscales, means were used as cut-offs to obtain the four attachment orientations: secure, dismissing, preoccupied, fearful-avoidant.

The *Depression module of the Patient Health Questionnaire* (*PHQ-9*) [22] measures depression on nine items, reflecting DSM-IV symptom criteria. Items are scored on a four-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), with a total score ranging from 0 to 27. Scores ≥ 10 indicate moderate depression, and scores ≥ 15 indicate severe depression. The instrument shows high internal consistency with Cronbach's $\alpha = .89$ in the German adaptation (Löwe, Kroenke, Herzog, & Gräfe, 2004), as well as in the current study sample ($\alpha = .76$).

The German adaptation of the *Death and Dying Distress Scale* (*DADDS*) [23] is a self-report instrument assessing specific concerns of advanced cancer patients concerning insecurity about one's end of life and being a burden to others, as well as lost time and opportunities. The German version includes nine items with a five-point Likert scale and shows high internal consistency with Cronbach's $\alpha = .89$ [25]. In the current study sample, we also found high internal consistency (Cronbach's $\alpha = .83$). Items can be scored from 0 (no distress) to 4 (very much distress), resulting in a sum score from 0 to 36, a higher score indicating higher distress.

The *Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale* (*FACIT-SP*) [24] is part of the FACIT measurement system and measures in what way spirituality and religion contribute to the quality of life of cancer patients. Patients are asked to indicate to what extent they agree with the 12 statements measuring the two subscales meaning/peace (eight items) and faith (four items). Items can be scored from 0 (not at all) to 4 (very much). FACIT-SP scores range from 0 to 48. High scores indicate spiritual well-being. Subscales and the sum score show high internal consistency in the current sample (Cronbach's $\alpha = .87$–$.88$).

Statistical analysis

We tested the mediation hypothesis with two regression analyses to evaluate the role of spiritual well-being as a mediator of the association between attachment and depression (1) and death anxiety (2). Therefore, we interpreted direction and size of the indirect effects [25]. An indirect effect represents the ability of M (spiritual well-being) to mediate the effect of X (attachment) on Y (depression/death anxiety). We performed statistical analyses using the Statistical Package for the Social Sciences, version 23.0. We used bootstrapping for our analyses, which involves repeatedly sampling from the data set and estimating the indirect effect (effects of the predictor on the outcomes through the mediators) in each resampled data set. Bootstrapping tends to have very high power and a good type I error control and has thus been recommended for testing mediation hypothesis [26, 27]. Unlike the Sobel test, it does not make an assumption about the shape of the sampling distribution of the indirect effect. To obtain bootstrap estimates and bias-corrected confidence intervals (CIs), we used the PROCESS macro [27]. For the current study, we generated 5000 bootstrap estimates to calculate 95% bias-corrected CIs which were estimated for all tests of the indirect effect. If the confidence interval does not include zero, the indirect effect is a significant mediator.

PROCESS version 2.14 accepts multicategorical variables for the focal predictor (attachment styles) [28]. We used indicator coding, analogous to the creation of dummy variable coding, to represent the four attachment styles. In the two mediation models, we compared the three insecure attachment (preoccupied, fearful-avoidant, dismissing) to secure attachment. There was no multicollinearity, as intercorrelations between predictors ranged between $r = 0.01$ and $r = 0.48$. Also, the total and subscale scores were approximately normally distributed.

Results

Sample characteristics and descriptive statistics

In the current data analysis, 190 patients were included. Participating patients were mostly married, had children, and were well-educated, and both sexes were almost equally represented (Table 1). The mean time since first diagnosis was 39.18 months. Descriptive statistics for the study variables are presented in Table 2.

Table 1 Demographic and medical characteristics (N = 190*)

	Number	Percentage
Mean age in years (SD; range)	M: 57.81 (SD, 11.64; 29–81)	
Women	116	61.1
Married	106	55.8
Children	128	67.4
Educational level		
Elementary school	34	19.2
Junior high school	53	29.9
High school/university degree	90	50.9
Employment status		
Retired	87	48.1
Employed	72	39.7
Unemployed/other	22	12.2
Medical characteristics		
Tumor entity		
Gastrointestinal	58	31.0
Lung	24	12.8
Gynecological	21	11.2
Breast	27	14.4
Urogenital	19	10.2
Endocrinological	11	5.9
Others	27	14.5
Type of disease		
Primary disease	139	77.2
Relapse	33	18.3
Second tumor	8	4.4
Tumor stage (UICC)		
III	24	12.7
IV	166	87.3
Illness duration, mean months since first diagnosis	M: 39.18 (SD, 61.9; 0–361)	

*Some of the data show less than 190 cases in total. This is due to missing data in single sociodemographic and medical variables

Mediation analysis

Bivariate associations between attachment insecurity, spiritual well-being, depression, and death anxiety are reported in Table 3. Table 4 displays the parameter estimates for the mediating effects (indirect effects) of spiritual-wellbeing on the association between attachment orientation on depression and death anxiety, respectively. The spiritual well-being of fearful-avoidant patients significantly mediated the association between attachment insecurity and depression and death anxiety.

Figure 1 displays the significant total effect (c) in the bivariate model of attachment orientation and depressive symptomatology (A). In comparison to secure attachment, fearful-avoidant attachment predicts higher depressive symptomatology. Figure 1B shows that spiritual well-being significantly mediates this relationship. In the total model, the indirect effect ($-7.22x - .19 = 1.38$) explains 11% ($R^2 = 0.11$, $F = 7.14$, $p < .002$) of the variance of depressive symptomatology. The unstandardized coefficients for the association between fearful-avoidant attachment and spiritual well-being (a), as well as the association between spiritual well-being and depressive symptomatology (b) and the direct effect (c'), are displayed in Fig. 1B. Proportional to the direct effect of attachment (c' = 2.35) on depressive symptomatology, the total effect (c = 3.71) explains 37% of the variance, whereas the direct effect explains 63% (2.35/3.71 = 0.63). Yet, spiritual well-being mediates the association between attachment and depressive symptomatology partially. Fearful-avoidant attachment in comparison to secure attachment is associated with lower spiritual well-being, which in turn is associated with higher depressive symptomatology. The total effect (c) describes that depressive symptomatology in advanced cancer patients is significantly influenced through fearful-avoidant attachment via spiritual well-being. Neither dismissingly nor preoccupied attached patients differ in terms of spiritual well-

Table 2 Descriptive statistics ($N = 190$)

Variables	Measure	Mean (SD)	Median	Range	
				Observed	Possible
Spiritual well-being	FACIT-Sp	23.72 (8.9)	23	3–47	0–48
Depression	PHQ-9	11.23 (5.1)	11	1–25	0–27
Death anxiety	DADDS	17.12 (7.1)	17	2–34	0–36
Attachment	ECR-M16				
Attachment anxiety		25.38 (10.2)	25	8–52	8–56
Attachment avoidance		24.26 (8.9)	24.5	8–48	8–56
Distribution of attachment orientation					
	N	%			
Securely attached	64	34			
Insecurely attached	124	66			
Fearful-avoidant	62	32			
Dismissing	34	18			
Preoccupied	30	16			

being and depressive symptomatology in comparison to securely attached patients.

Figure 2 displays a significant total effect in the bivariate model of attachment style and death anxiety (Fig. 1A). Fearful-avoidant attachment significantly predicts higher levels of death anxiety in comparison to secure attachment. Figure 1B shows that spiritual well-being significantly mediates this relationship. In the total model, the indirect effect ($-6.76 \times -.32 = 2.16$) explains 15% ($R^2 = 0.15$, $F = 10.36$, $p < .001$) of the variance of death anxiety. The unstandardized coefficients for the association between fearful-avoidant attachment and spiritual well-being (a), as well as the association between spiritual well-being and death anxiety (b) and the direct effect (c) are displayed in Fig. 1B. Proportional to the direct effect of attachment ($c' = 4.3$) on death anxiety, the total effect ($c = 6.48$) explains 34% of the variance, whereas the direct effect explains 66% ($4.3/6.48 = 0.66$). Yet, spiritual well-being mediates the association of attachment and death anxiety partially. Fearful-avoidant attachment in comparison to secure attachment was associated with higher death anxiety through lower spiritual well-being. The total effect (c) describes that death anxiety in advanced cancer patients is significantly influenced through fearful-avoidant attachment via spiritual well-being. Dismissingly and preoccupied attached patients do not differ in terms of spiritual well-being and death anxiety in comparison to secure attached patients.

Table 3 Bivariate associations between attachment styles, spiritual well-being, depression, and death anxiety

	ECR-M16	FACIT-Sp	PHQ-9	DADDS
ECR-M16	–			
FACIT-Sp	−.37**	–		
PHQ-9	.34**	.38**	–	
DADDS	.44**	.48**	.36**	–

**$p < .01$

Discussion

We examined whether spiritual well-being mediated the relationship between attachment insecurity and psychological distress in advanced cancer patients. Spiritual well-being significantly mediated the association of fearful-avoidant attachment and depression as well as death anxiety. We found no mediating effect for dismissingly and preoccupied attachment. Our results indicate that fearful-avoidant patients are at high risk for both, depressive symptomatology, as well as death

Table 4 Indirect effect of insecure attachment orientation in comparison to secure attachment on depression and death anxiety through spiritual well-being

Attachment style	Parameter estimates	SE	BC 95% CI	
			LL	UL
Depression				
Dismissing	0.46	0.41	−0.30	1.29
Preoccupied	0.44	0.37	−0.27	1.19
Fearful-avoidant	1.36	0.38	0.70	2.15
Death anxiety				
Dismissing	0.69	0.65	−0.58	1.97
Preoccupied	0.74	0.61	−0.38	2.03
Fearful-avoidant	2.17	0.62	1.11	3.51

SE standard error, *BC* bias corrected, *CI* confidence interval, *LL* lower limit, *UL* upper limit

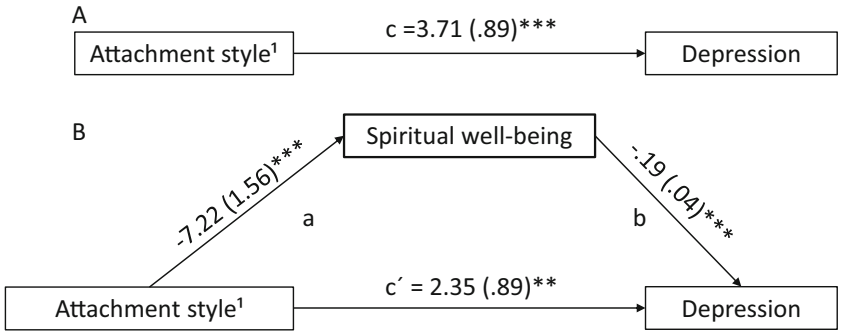

Fig. 1 Mediation model of the relationship between attachment style[1] and depression mediated through spiritual well-being. **a** Direct model and (**b**) indirect mediation model. Unstandardized coefficients (SE). *$p < .05$, **$p < .01$ ***$p < .001$. [1]Fearful-avoidant attachment in comparison to secure attachment

anxiety, and that this association is explained via lower spiritual well-being.

Fearful-avoidant patients experience less spiritual well-being, which in turn expedites psychological distress. Current literature is focusing on high distress in fearful-avoidant patients [3, 4]. This may be because they show both anxious and avoidant tendencies in their interpersonal relationships, meaning they have a high need for attention and care but are afraid to ask for help because they expect to be rejected. This dilemma may result in feelings of helplessness. In terms of religion as one way of generating spiritual well-being, Granqvist et al. [29, 30] describe the relationship with god as an attachment relationship. They explain religious coping through two pathways: as an expression of secure attachment, corresponding to early experiences of reliable relationships (corresponding hypothesis), or as a way of compensating insecure attachment (compensation hypothesis). In a study with healthy individuals belonging to religious-spiritual groups [29], securely attached individuals had more loving God images and more gradual religious changes (corresponding hypothesis), whereas insecurely attached individuals have been related to sudden-intense religious changes (compensation hypothesis). Granqvist et al. [29] do suggest that insecurely attached patients, regardless of experiencing spirituality per se, experience meaning or spirituality as they perceive the relationship with god as helpful in regulating distress. Yet, the relationship with god loses its importance as soon as, for example, a romantic partner becomes available. This compensation process may not have been detected by the measure we used to assess spiritual well-being. Its items rather measure feelings of peacefulness, a sense of purpose, and finding comfort and strength in one's faith or spiritual beliefs than religiosity [13]. Loetz et al. [15] link the theory of attachment to spirituality by identifying common aspects of the two concepts: security and exploration. Insecurely attached individuals, such as fearful-avoidant patients, might not be exploring possible new external or internal relationships in terms of transcendent and spiritual concepts, because they miss out the secure base from where out they could explore freely. In comparison to securely attached individuals, fearful-avoidant attached patients tend to have difficulties in finding peace and meaning within themselves or in relation to a transcendent figure and through that experience more depression.

We found no mediation effect of spiritual well-being with dismissing attachment and psychological distress. Dismissingly attached patients are known to report very low distress, potentially suppressing negative emotions [31]. Also, deactivating strategies concerning emotions in those patients have been described [32]. Those patients potentially do not perceive positive emotions or cognitions such as feeling peaceful and feeling a sense of harmony, which are included in the construct of spiritual well-being.

In our model, we found preoccupied attachment and death anxiety being significantly associated, whereas there was no association between preoccupied attachment and spiritual well-being. This result needs to be further investigated, as it questions the assumptions of the compensation hypothesis. It needs to be clarified which characteristics of insecure patients lead to spirituality in general and spiritual well-being, specifically. We assume a general distinction between the three

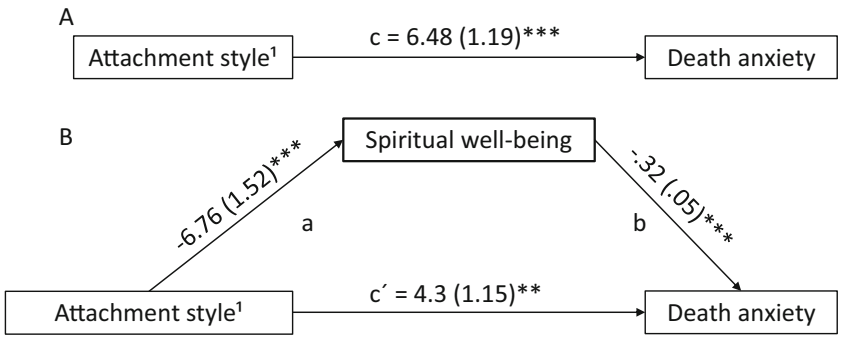

Fig. 2 Mediation model of the relationship between attachment[1] and death anxiety mediated through spiritual well-being. **a** Direct model and (**b**) indirect mediation model. Unstandardized coefficients (SE). *$p < .05$ **$p < .01$ ***$p < .001$. [1]Fearful-avoidant attachment in comparison to secure attachment

insecure attachment styles and their association with spiritual well-being, as patients also tend to show different levels of emotional distress and also act differently when diagnosed with a terminal disease, according to the four attachment styles [5, 33].

Current studies point to differences concerning the influence of specific attachment styles on spiritual coping in palliative care [34]: reflecting on our results, preoccupied attached patients had the lowest score in spiritual coping. Thus, other associations have been different from our findings. Regarding the different associations of specific attachment styles to spiritual well-being, further research is needed.

One limitation of our study arises from the categorical approach to characterize attachment. This procedure was conducted in accordance with Meuti et al. [35]. Due to methodological reasons, the dimensional measurement of attachment insecurity is functional for use in research [36]. This contrasts with the clinical use of the categorical approach. For physicians and psychologists, it may be easier to handle the categorical approach by finding similarities to prototypes of different attachment styles [37]. Ravitz et al. [38] state that there is no final consensus about whether attachment insecurity is inherently categorical or dimensional, but they make it clear that categories can be affiliated from dimensional scales, as it was performed in the current analysis. Present results support the categorical approach, as the observed differences between fearful-avoidant and dismissing attachment are thus easier to translate into clinical practice. Nevertheless, due to the frequent use of the dimensional approach, results are more difficult to discuss, which could be argued to be a limitation of this study.

The comparability of our results is partially limited through the discrepancy of the mean score of spiritual well-being in our sample (23.7) in comparison to the mean score (38.5) described by Petermann et al. [24]. This fits with current research literature, describing European people as being less spiritual than Americans and Latinos, being included into Petermann's sample [39, 40]. At the same time, the mediating effect of spiritual well-being needs to be quite strong, when showing up even in this secular study sample.

Our study is limited by its cross-sectional design. Longitudinal data is needed to confirm our findings. Also, due to the CALM RCT inclusion criteria (PHQ ≥ 9), the generalizability of the results is reduced to patients with a high amount of depressive symptoms. Finally, the strength of our results is partially limited due to missing assessment of validity of the measures in the actual study population.

Our results illustrate the importance of spiritual well-being as a function of the attachment system for advanced cancer patients' mental health. Attachment insecurity and spirituality are not very prevalent subjects in the treatment of advanced cancer patients. Still, literature indicates possibilities of establishing a therapeutic alliance that fosters secure attachment [41, 42]. Over the last decade, there is a growing evidence base for therapies for advanced cancer patients which focus on meaning and spirituality [43, 44]. Yet, to our knowledge, the combination of both attachment insecurity and spirituality in therapeutic concepts for advanced cancer patients is unique in CALM therapy. CALM therapy focuses on attachment and meaning as two important variables in psychotherapy for advanced cancer patients, emphasizing the communication with the healthcare team and changes in personal relationships, as well as spirituality and a sense of meaning and purpose [45]. Therapists try to take into account their patients' attachment orientation and open up a reflective space for their thoughts about spirituality or sense of meaning and purpose. Thus, results of the CALM study will give further answers regarding the specific processes of attachment and spirituality in psychotherapeutic settings [18]. Already, the current results facilitate an improvement of the intervention in clarifying the specific impact of attachment and spiritual well-being on psychological distress in advanced cancer patients.

Compliance with ethical standards The study protocol was approved by local ethics committees in both study centers (Hamburg reference number: PV4435; Leipzig reference number: 143–14–14042014). All patients provided written informed consent prior to participation and could withdraw their informed consent at all times without having any disadvantage in their medical or psychological treatment

Conflict of interest This research was supported by the German Cancer Aid. The authors declare not having any financial relationship with the organization. The authors have full control of all primary data and agree to allow the journal to review the data if requested.

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