

RESEARCH ARTICLE

Accepting the unacceptable? Exploring how acceptance relates to quality of life and death anxiety in a cancer population [version 1; peer review: 1 approved, 1 approved with reservations]

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Abstract

Background: Quality of life is a core concern for cancer patients, which can be negatively affected by illness-related death anxiety; yet understanding of how to appropriately target psycho-oncological interventions remains lacking. We aimed to explore experiential acceptance in cancer patients, and whether acceptance – as an alternative to avoidant coping – was related to and predictive of better quality of life and death anxiety outcomes.

Methods: We used a longitudinal, quantitative design with a follow-up after three months. Seventy-two participants completed a questionnaire-battery measuring illness appraisals, acceptance and non-acceptance coping-styles, quality of life, and death anxiety; 31 participants repeated the battery after three months.

Results: Acceptance was an independent explanatory and predictive variable for quality of life and death anxiety, in the direction of psychological health. Acceptance had greater explanatory power for outcomes than either cancer appraisals or avoidant response styles. Avoidant response styles were associated with greater death anxiety and poorer quality of life.

Conclusions: The findings support the role of an accepting response-style in favourable psychological outcomes, identifying a possible target for future psychological intervention. Response styles that might be encouraged in other therapies, such as active coping, planning, and positive reframing, were not associated with beneficial outcomes.

Keywords

ACT, Acceptance, Death, Cancer, Quality of Life, Death anxiety

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Cancer and experiential distress

In the UK, an estimated 50% of people born after 1960 will experience cancer in their lifetime (Cancer Research UK, 2014). During phases of diagnosis, treatment, and remission, up to 75% of cancer patients experience anxiety (Cardy *et al.*, 2006), reduced quality of life (QoL) (Ciarrochi *et al.*, 2011), and heightened levels of grief, pain, fatigue, and depression (Barraclough, 1999). Many cancer patients concomitantly report intrusive thoughts and worry in relation to their survival, and preoccupation with existential thoughts and death anxiety (Adelbratt & Strang, 2000).

Death anxiety is described as “an emotional reaction involving subjective feelings of unpleasantness and concern”, evoked by “the anticipation of a state in which the self does not exist” (Hoelter, 1979; Tomer & Eliason, 1996), and correlates with general anxiety, depression, and perceived shortened life-expectancy. Advanced cancer patients may experience different appraisal and response styles (Rinaldis *et al.*, 2009), and higher rates of death anxiety and negative wellbeing (Adelbratt & Strang, 2000; Neel *et al.*, 2015; Vodermaier *et al.*, 2011). Patients with aggressive or late-stage pancreatic, lung, and prostate cancers report greater levels of existential distress and suicidal risk (Bill-Axelsson *et al.*, 2010; Zabora, *et al.*, 2001), as the subjective and objective threat to life increases. It is logical to suggest that death anxiety and negative quality of life may therefore augment in line with worsening prognosis and perceived severity of the disease (Gao *et al.*, 2010; Rinaldis *et al.*, 2009), and that increasingly-proximal threats to life may affect appraisal, response styles, and wellbeing. It is also clear that not everyone with cancer experiences acute distress, suggesting there are probable mechanisms in action, which warrant further investigation.

Terror Management Theory, acceptance, and response styles in cancer

Terror Management Theory (TMT) (Greenberg *et al.*, 1986) suggests that death anxiety is innate and universal, with the degree of death awareness varying between individuals; potentially being higher in those whose lives are more threatened by disease. TMT suggests we must stave off the conscious ‘terror of death’ through proximal defensive mechanisms of thought suppression, denial, and distraction (Greenberg *et al.*, 1986), and that such avoidant defences must be strengthened to alleviate anxiety and promote quality of life (Mosher & Danoff-Burg, 2007). TMT posits that, when confronted by an overt mortality-threat (as when diagnosed and living with cancer), individuals who can avoid or control unwanted internal experiences (threatening thoughts, feelings, and sensations) will have more favourable outcomes.

However, emerging evidence for the role of acceptance in physical health populations supports an alternative model of psychological functioning and intervention. Acceptance and Commitment Therapy (ACT) (Hayes *et al.*, 2011) suggests that efforts to avoid and control inner experiences come at a high cost to the individual, and do not provide a successful or protective long-term solution. For example, attempts to suppress thoughts

have been shown to heighten their frequency and emotional salience (Hayes *et al.*, 2011), such that problematic avoidance behaviours inadvertently increase in an effort to escape increasing numbers of anxiety-eliciting related stimuli (Solomon *et al.*, 2015).

Although empirical evidence is mixed, avoidant responses – including denial, disengagement, self-blame, and emotion-focused control – have been found to be associated with anxiety, depression, lower treatment compliance, and poorer QoL in cancer patients (Carver *et al.*, 1993; Hulbert-Williams *et al.*, 2015; Nipp *et al.*, 2016; Šoštarič & Šprah, 2004; Stanton *et al.*, 2000). Conversely, open responses, which facilitate the expression of affect, have been linked to better adjustment and QoL in cancer (Stanton *et al.*, 2000). Furthermore, research has implicated the role of illness appraisals (i.e., cognitive appraisals of how illness will affect the patient’s life) in determining quality of life, yet attempts to directly modify these appraisals, as might be applied in traditional Cognitive Behaviour Therapy (CBT), encounter the same limitations (and ironic effects) as thought-suppression (Villardaga *et al.*, 2013). This provides scope to investigate whether cancer- and death-related thoughts and anxieties can be safely accepted and experienced, rather than avoided.

Accepting unwanted experiences in cancer

ACT seeks to change relationships to psychological events, rather than to directly lessen, control, or alter the events themselves (Hayes *et al.*, 2006; Hayes *et al.*, 2011). In contrast to TMT, ACT would therefore suggest that attempts to avoid and control painful cancer-related inner experiences inadvertently create a state of suffering and unhelpful ‘experiential avoidance’. Acceptance here is a willingness to allow all thoughts and feelings to occur without judgement or avoidance, and is therefore the opposite of the experiential avoidance theorised to underpin poor psychological health, anxiety, and depression (Kashdan & Rottenberg, 2010), and is also diametrically opposed to the response styles advocated by TMT. ACT is one of several contemporary cognitive and behavioural intervention-models that promote open (versus avoidant) responding to difficult experiences (such as death anxiety) – positing that such responses may be more adaptive (Hayes *et al.*, 2011).

Present study

ACT is effective at improving QoL in populations with health conditions such as chronic pain, diabetes and HIV (e.g. A-Tjak *et al.* 2014). Although research into ACT processes and cancer is inchoate, initial findings are promising (Hulbert-Williams *et al.*, 2015; Low *et al.*, 2016; Tauber *et al.*, 2019) and warrant further analytical study of the putative relationship between experiential acceptance and better psychological outcomes. Given that contrasting predictions may be made from a TMT perspective (which would arguably favour avoidance- over acceptance-based coping) empirical evidence is needed to resolve theoretical differences (with important implications for practice). A need for longitudinal and processual studies on acceptance/ACT processes in cancer has been identified (Dunne *et al.*, 2017; Rand *et al.*, 2012). This study therefore aimed to investigate concurrent and temporal relationships between acceptance, QoL, and death anxiety in an inclusive sample of cancer patients.

Methods

Aims and design

The primary aim of this study was (1) to examine whether acceptance was concurrently related to better quality of life and death anxiety outcomes in cancer patients. Secondary aims were to examine: (2) whether/how illness attributions and alternative (non-acceptance) response-styles concurrently related to QoL and death anxiety outcomes, and (3) any temporal relationships between acceptance and outcomes, over a three-month follow-up period.

The study used a longitudinal, quantitative design. At two time-points, participants completed several demographic and clinical questions, and a battery of standardised questionnaires, which measured cancer appraisal, response styles, and both death anxiety and QoL.

Ethics and consents

The study was granted ethical approval by the National Health Service (NHS) East Midlands Research Ethics Committee (REC reference 14/EM/1224), with governance approved locally by four participating NHS trusts.

Participants and procedure

A *priori* power calculation in G*Power software (3.1) estimated that (for 80% power at an alpha of 0.05) at least 32 participants were needed to detect the expected medium-sized correlation between acceptance and QoL (based on a correlation of $r = 0.47$, observed in previous research; Hulbert-Williams *et al.*, 2015) – i.e., an n of 32 was required to address the primary study aim. Moreover, an $n \geq 51$ would provide enough (80%) power to detect similar (or larger) effect sizes in regression analyses incorporating up to 5 potential explanatory variables. Over-recruiting was desirable, to allow for attrition and to power any later multivariate analyses. At the first timepoint (time one of two) 74 participants were

recruited, but two participants' data sets were excluded due to having missing data on over 20% of the questionnaire; a threshold utilised elsewhere in research (e.g. Gillanders *et al.*, 2015). Pairwise deletion was used appropriately for the remaining items with missing data (Tabachnick & Fidell, 2007), as the relatively few missing data (7.4%) was shown to be concentrated across a few variables and missing at random, as established by Little's test ($\chi^2 = 321.54$, $df = 283$, $p = 0.057$).

Participants with cancer were invited to the study via one of two recruitment streams. Recruitment for the study took place between September 2015 and February 2016. Participants were either identified and approached by NHS clinical gatekeepers, or self-selected via advertisements placed online, using social media platforms and websites, such as Facebook, Twitter, and Cancer Chat. Clinical gatekeepers were recruited from hospitals and hospices, from where they identified potential participants and distributed questionnaire packs. Packs contained participant information sheets, consent forms, questionnaire batteries, and return envelopes. Online participants accessed the same information via an online survey programme. Participants were eligible if they were over 18, had experience of cancer, and lived in the UK. 46% of total participants completed paper questionnaires, and 54% completed online questionnaires. All participants were invited to take part in a follow-up questionnaire, conducted online, which took place three months after initial participation. The overall sample size was $n = 72$ for time one, and $n = 31$ for the follow-up.

Measures

A questionnaire battery was administered to measure three domains: background variables (demographics, cancer characteristics, and illness appraisals); response style variables (responses to appraisals); and outcome variables (QoL and death anxiety) (Table 1). The following standardised measures of appraisal, response styles, and outcomes were issued:

Table 1. Theoretically informed measurement framework and the measures used in each category.

| | 1 | 2 | 3 |
|----------------------|---|--|-----------------------------------|
| Theoretical category | Background variables | Response style variables | Outcome variables |
| Conceptual targets | Individual and clinical characteristics; cancer-related appraisals | Response-focused measures; ways of responding to cancer-related appraisals | Psychological outcome measures |
| Measurement targets | Demographic and clinical variables; cancer characteristics and beliefs | Acceptance and alternative coping/ response styles | Quality of life and death anxiety |
| Measures used | Brief IPQ Age Education Religion/spirituality Psychological support Bereavement Cancer site Cancer stage No. previous cancers | AAQ-II Brief COPE | FACT-G DAS |

Note. AAQ-II = Acceptance and Action Questionnaire II; DAS = Death Anxiety Scale; FACT-G = Functional Assessment of Cancer Therapy – General; Brief IPQ = Brief Illness Perceptions Questionnaire; Brief COPE = Brief Coping Orientation to Problems Experienced

Appraisal measure

Brief Illness Perception Questionnaire (Brief IPQ). The Brief IPQ (Broadbent *et al.*, 2006) is a nine-item questionnaire assessing the cognitive and emotional representations of illness. It is quick to administer and therefore suitable for populations who may feel unwell (Ng, 2012), and has good test-retest and discriminant reliability, and predictive and discriminant validity (Van *et al.*, 2011).

Scale items were made specific to a cancer population, e.g. by substituting the wording of ‘illness’ for ‘cancer,’ and to improve the comprehensibility of items 3, 7, 8, and 9, as recommended (Broadbent *et al.*, 2015). The anchoring system was also adapted to five-point Likert scale from the IPQ-Revised (using response anchors of ‘strongly disagree’ and ‘strongly agree’), as the original 0–11 scaling has been shown to be unsuitable for those with short-term prognoses (Price *et al.*, 2012). Higher Brief IPQ scores reflect a more threatening view of the illness.

Response style measures

Acceptance and Action Questionnaire II (AAQ-II). The AAQ-II (Bond *et al.*, 2011) is a seven-item measure of experiential acceptance, and in this study was scored in the direction of higher scores indicating greater experiential acceptance (versus experiential avoidance). Use of the AAQ-II is well-established in the ACT literature, and the measure has demonstrated satisfactory reliability and validity in general research and with cancer populations (Bond *et al.*, 2011; Feros *et al.*, 2013).

Brief COPE. The Brief COPE (Carver, 1997) measures coping (response) styles across 28 items on a 4-point Likert scale; instructions were adapted to focus on coping in the context of cancer (“the ways you’ve been coping with the stress in your life since you found out you had cancer”). Factor analysis indicates that the various response styles reflect two core factors (Eisenberg *et al.*, 2012): (1) avoidant coping (comprising self-distraction, denial, substance use, behavioural disengagement, venting, and self-blaming) and (2) approach coping (comprising active coping, use of emotional and instrumental support, positive reframing, planning, and [passive, resigned] acceptance [distinct from the active, willing acceptance targeted by the AAQ-II]). In the current study, the Brief COPE was scored accordingly, deriving two summary scores ([1] avoidant coping; [2] approach coping), with higher scores reflecting greater use of the respective class of responses. The Brief COPE has been used in cancer populations of varying cancer sites and stages, and has adequate validity and reliability for cancer populations (Yusoff *et al.*, 2010).

Outcome measures

Functional Assessment of Cancer Therapy - General (FACT-G). The FACT-G (Cella *et al.*, 1993) is a widely-used measure of cancer-related QoL (Ciarrochi *et al.*, 2011) across four domains on a Likert scale: emotional, functional, physical, and social. It has total score good reliability and validity; established across cancer subtypes (Webster *et al.*, 2003), and through correlations with mood, anxiety, and other health-related QoL measures (Luckett *et al.*, 2011). Higher scores suggest better cancer-related QoL.

Death Anxiety Scale (DAS) The DAS (Templer, 1970) uses a fixed choice, true/false format to assess attitudes towards death on 15 items. The DAS is a brief measure, which has internal validity, test-retest reliability (Templer, 1970), and remains the most widely used measure of death anxiety. The DAS has been used in both palliative and non-palliative cancer populations (e.g. Gonen *et al.*, 2012; Royal & Elahi, 2011), and has also been validated internationally in non-health populations (Sharif Nia *et al.*, 2014). Higher scores indicate increased death anxiety, with a cut-off score of 7 out of a possible 15.

Data analyses

Time One (T1). Preliminary analyses allowed for exploration and assumption checks to be carried out on the data, using IBM SPSS Statistics (version 22.0). Correlation analyses (Pearson’s *r*) were carried out to examine any zero-order relations among cancer stage, illness appraisal, response styles, and focal outcome variables (QoL and death anxiety).

Research aims 1 and 2 were met using hierarchical multiple regression analyses. Five models were run – one for each outcome/dependent variable of interest ([1] social, [2] emotional, [3] functional, and [4] physical QoL; [5] death anxiety). Acceptance (AAQ-II) and appraisal (IPQ) scores were included as *a priori* predictors of interest in all regression models, alongside response-style variables (avoidant coping and/or approach coping) that demonstrated significant zero-order correlations with the modelled outcome variable (as recommended by Tabachnick & Fidell, 2007). Explanatory variables were entered into the model in two blocks: Block one without the AAQ-II, and block two with the AAQ-II. This allowed R^2 -change scores to be calculated for the incremental contribution of acceptance (AAQ-II) to each model.

Time Two (T2). Preliminary t-tests were carried out to establish whether any significant changes occurred between T1 and T2 (three-month follow-up). Aim 3 was met using partial correlations and hierarchical multiple regression analyses, with T1 outcomes controlled for in each analysis of T2 outcomes.

Results

Participant characteristics

At T1, 72 participants completed a battery of questionnaires. The sample comprised 41 females, and 31 males (see Table 2 and underlying data (Moghaddam, 2020)). Of these participants, 58% were over 50 years old, with a modal age range of 65–74 years. There was a wide range of cancer sites reported, the most common of which were: breast (26.4%), prostate (25%), bowel (12.5%), lung (9.7%) and ‘other’ (16.7%). Of participants, 75% knew the stage of their cancer, and of these, 33.3% reported stage I or II cancers, and 41.6% reported stage III or IV. Secondary cancers were reported by 24% of participants, and 24% of participants had also had cancer at least once before. Clinically significant levels of distress were reported by 60% of the sample, as measured by HADS scores reaching 8 or above (Zigmond & Snaith, 1983), and 44% experienced high death anxiety, as measured on the Death Anxiety Scale, equalling or exceeding a cut-off score of 7.

Table 2. Characteristics of the overall sample at time one.

| Sample demographics | Sample (N = 72) | Percentage % |
|----------------------------|-----------------|--------------|
| Gender | | |
| Male | 31 | 43.1 |
| Female | 41 | 56.9 |
| Age range | | |
| 18–24 | 0 | - |
| 25–34 | 7 | 9.7 |
| 35–44 | 6 | 8.3 |
| 45–54 | 17 | 23.6 |
| 55–64 | 12 | 16.7 |
| 65–74 | 19 | 26.4 |
| 75+ | 11 | 15.3 |
| Cancer site | | |
| Primary: | | |
| Unknown | 3 | 4.2 |
| Breast | 19 | 26.4 |
| Prostate | 18 | 25.0 |
| Other | 12 | 16.7 |
| Bowel | 9 | 12.5 |
| Lung | 7 | 9.7 |
| Blood | 4 | 5.6 |
| Secondaries | 17 | 23.6 |
| Cancer stage | | |
| I | 3 | 4.2 |
| II | 21 | 29.2 |
| III | 16 | 22.2 |
| IV | 14 | 19.4 |
| Unknown | 18 | 25.0 |
| Highest level of education | | |
| Missing | 2 | 2.8 |
| None | 12 | 16.7 |
| Level 1 or below | 2 | 2.8 |
| GCSE | 17 | 23.6 |
| A-Level | 4 | 5.6 |
| Higher Education or above | 35 | 48.6 |
| Religion/spirituality | | |
| Yes | 25 | 34.7 |
| No | 47 | 65.3 |
| Number of previous cancers | | |
| 0 | 55 | 76.4 |
| 1 | 16 | 22.2 |
| 2 + | 1 | 1.4 |

At T2, a follow-up rate of 53% ($n = 31$) was obtained from participants who had consented to the follow-up and then completed it. There were no significant differences in demographic or outcome variables between T2 participants who did and did not respond. Three participants had died between T1 and T2. Similar to the make-up of the T1 sample, the most common cancers reported were breast (26%), prostate (16%), and blood (10%), with 23% of participants reporting secondary cancers, and 13% having experienced more than one episode of cancer.

T1: Correlational analyses

Correlations between cancer stage, appraisal, response style, and outcome variables of interest are presented in Table 3. Cancer appraisal scores, measured on the Brief IPQ, demonstrated significant positive correlations with avoidance coping and death anxiety ($r_s = 0.34$ and 0.35). Cancer appraisal was also negatively related to acceptance (AAQ-II score) and emotional QoL ($r_s = -0.36$ and -0.26 , $p_s < 0.05$), and positively correlated with stage of cancer ($r = 28$, $p < 0.05$). Earlier stage of cancer was associated with worse physical and functional QoL ($r_s = -0.37$ and -0.27 , $p_s < 0.05$).

Avoidance coping (derived from the Brief COPE) demonstrated significant, moderate-to-large associations with poorer emotional and functional QoL ($r_s = -0.44$ to -0.64) and greater death anxiety ($r = 0.50$) – and was thus entered as a response-style variable (alongside experiential acceptance) in subsequent regression analyses of these outcome variables. Avoidant response-style and experiential acceptance demonstrated a (conceptually consistent) inverse relationship of large magnitude ($r = -0.71$). Higher levels of acceptance (as measured by the AAQ-II) were significantly associated with more desirable outcomes on all outcome measures: Demonstrating small-to-moderate positive associations with social and physical QoL ($r_s = 0.26$ to 0.30), large positive associations with emotional and functional QoL ($r_s = 0.50$ to 0.73), and a large negative association with death anxiety ($r = -0.57$).

T1: Regression analyses

Alongside *a priori* explanatory variables of interest (acceptance [AAQ-II] and illness appraisal [IPQ]), avoidant coping was entered into regressions for functional, emotional, and death anxiety outcomes (i.e., those outcomes demonstrating significant zero-order correlations with avoidant coping).

Hierarchical regression results are displayed in Table 4. The addition of acceptance (AAQ-II, in block two) led to statistically significant increases in R^2 and F values for four of the five models. Indeed, the social QoL model only reached significance following the addition of acceptance (increase in $R^2 = 0.11$, $F(1,69) = 8.68$, $p = 0.004$). Acceptance demonstrated the strongest associations with outcome (based on absolute values of standardised coefficients) in four (of five) models and explained between 9% and 18% of unique model variance in these models (as indicated by incremental R^2). Across models, acceptance had a significant positive relationship

Table 3. Time one bivariate correlation matrix between background, response style, and outcome variables.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------|---|-------|---------|---------|-------|-------|---------|---------|---------|---------|
| 1 Stage of cancer | | .283* | -.007 | .039 | .016 | .072 | -.141 | -.268* | -.372** | -.013 |
| 2 Brief IPQ | | | -.361** | .338** | .190 | .204 | -.257* | -.161 | -.165 | .353** |
| 3 Acceptance (AAQ-II) | | | | -.709** | -.039 | .298* | .729** | .496** | .256* | -.571** |
| 4 Avoidance coping | | | | | .266* | -.217 | -.637** | -.435** | -.222 | .498** |
| 5 Approach coping | | | | | | .210 | -.049 | .059 | -.088 | .097 |
| 6 FACT-G Social | | | | | | | -.326** | .456** | .292* | .000 |
| 7 FACT-G Emotional | | | | | | | | .621** | .327** | -.461** |
| 8 FACT-G Functional | | | | | | | | | .695** | -.225 |
| 9 FACT-G Physical | | | | | | | | | | -.003 |
| 10 DAS | | | | | | | | | | |

* $p < 0.05$, ** $p < 0.01$

Note 1: Rows 1–2 = background variables, 3–5 = response style variables, and 6–10 = outcome variables

Note 2: Background variables demonstrating ≤ 1 significant association with focal response-style and outcome variables were suppressed

Note 3: AAQ-II = Acceptance and Action Questionnaire II; DAS = Death Anxiety Scale; FACT-G = Functional Assessment of Cancer Therapy – General; Brief IPQ = Brief Illness Perceptions Questionnaire

Table 4. Two-block hierarchical multiple regression results for time one variables.

| Outcome variable (n) | Block | Predictors entered | St. β | t | p | ΔR^2 | df | F | p |
|------------------------|-------|--------------------|-------------|--------|-------|--------------|------|-------|-------|
| FACT-G Social (72) | 1 | IPQ | .034 | 0.28 | .780 | .001 | 1,70 | 0.00 | .780 |
| | 2 | IPQ | .142 | 1.19 | .238 | .112** | 1,69 | 8.68 | .004 |
| | | AAQ-II | .351** | 2.95 | .004 | | | | |
| FACT-G Emotional (65) | 1 | IPQ | -.236* | -2.25 | .028 | .398** | 2,62 | 20.51 | <.001 |
| | | Avoidance | -.510** | -4.86 | <.001 | | | | |
| | 2 | IPQ | -.219* | -2.46 | .017 | .176** | 1,61 | 25.21 | <.001 |
| | | Avoidance | -.104 | -0.87 | .389 | | | | |
| FACT-G Functional (65) | 1 | IPQ | -.189 | -1.53 | .132 | .162** | 2,62 | 5.99 | .004 |
| | | Avoidance | -.297* | -2.40 | .020 | | | | |
| | | AAQ-II | .421** | 2.72 | .009 | | | | |
| | 2 | IPQ | -.177 | -1.50 | .139 | .090* | 1,61 | 7.38 | .009 |
| | | Avoidance | -.006 | -0.04 | .971 | | | | |
| FACT-G Physical (72) | 1 | IPQ | -.346** | -3.081 | .003 | .119** | 1,70 | 9.49 | .003 |
| | 2 | IPQ | -.295* | -2.519 | .014 | .024 | 1,69 | 1.95 | .167 |
| | | AAQ-II | .164 | 1.40 | .167 | | | | |
| | | Avoidance | .134 | 0.90 | .375 | | | | |
| DAS (64) | 1 | IPQ | .082 | .687 | .495 | .238** | 2,61 | 9.55 | <.001 |
| | | Avoidance | .454** | 3.82 | <.001 | | | | |
| | 2 | IPQ | .067 | 0.61 | .546 | .110** | 1,60 | 10.11 | .002 |
| | | Avoidance | .134 | 0.90 | .375 | | | | |

* $p < 0.05$, ** $p < 0.01$

Note 1: AAQ-II = Acceptance and Action Questionnaire II; DAS = Death Anxiety Scale; FACT-G = Functional Assessment of Cancer Therapy – General; IPQ = Illness Perceptions Questionnaire (assessed via Brief IPQ)

Note 2: Only response style variables which significantly correlated with each outcome were entered in the models. Brief IPQ and AAQ-II were entered into all models.

with emotional, functional, and social QoL, and a significant negative relationship with death anxiety. Cancer appraisals achieved significant explanatory power for emotional and physical outcomes – more negative appraisals were associated with poorer QoL in these domains, and these associations remained significant when modelled alongside acceptance. Notably, physical QoL was not associated with acceptance: Cancer appraisal was an informative variable in this domain (accounting for 12% of the variance in physical QoL) and acceptance was not incrementally informative (only explaining an additional 2% of the variance).

Avoidant coping demonstrated significant associations with emotional and functional QoL and death anxiety, but these associations did not survive entry of acceptance in the second block of respective models. This indicated that the acceptance measure (AAQ-II) overlapped with avoidant coping whilst accounting for additional unique variance in outcomes.

T2 analyses

Repeated-measures *t*-tests (Table 5) revealed that outcome scores significantly changed over time in all four QoL sub-domains: emotional, social, physical, and functional. The direction of change showed that emotional and physical QoL scores significantly increased over time, whereas social and functional QoL decreased. There was no significant change in reported death anxiety. Moreover, scores were stable over time for illness appraisals and all response style variables ($ps > 0.05$). No shifts in participants' demographic or clinical details were identified between T1 and T2.

T2: Partial correlations and regression analyses

Partial correlations were carried out between the T1 response style that had previously emerged as significant (avoidant coping), and the outcome variables showing significant change at T2 (QoL sub-domain scores; Table 6). Avoidant coping at T1 was not significantly correlated with T2 outcomes and was consequently excluded from subsequent regression analyses.

A two-block hierarchical regression model was tested for each T2 outcome variable, regressing the T2 QoL outcomes onto T1 values for cancer appraisal (IPQ) and acceptance (AAQ-II; as *a priori* explanatory variables of interest) whilst controlling for QoL at T1, such that T2 outcomes represent change-scores (Table 7).

T1 acceptance was a significant explanatory predictor of future functional QoL ($\beta_{\text{standardised}} = 0.45, p = 0.008$) and social QoL ($\beta_{\text{standardised}} = 0.38, p = 0.036$). The direction of these coefficients was consistent with T1 regressions, with acceptance predictive of higher future QoL. Cancer appraisal was also a significant explanatory predictor of functional QoL ($\beta_{\text{standardised}} = 0.38, p = 0.023$), but acceptance accounted for 19% of the unique variance in this model, over and above variance explained by cancer appraisal and functional QoL at T1. In regression models for other T2 outcome variables, none of the entered predictor variables reached significance – although

Table 5. Dependent *t*-test, means, and standard deviations for time one and two outcome variables.

| Outcome Variable | Time One | | Time Two | | t-test |
|-------------------|----------|------|----------|------|----------|
| | Mean | SD | Mean | SD | <i>p</i> |
| FACT-G Social | 16.73 | 5.91 | 10.17 | 7.61 | <.001** |
| FACT-G Emotional | 16.32 | 4.71 | 19.30 | 2.81 | .001** |
| FACT-G Functional | 16.12 | 6.20 | 10.68 | 8.65 | .004** |
| FACT-G Physical | 21.30 | 4.92 | 26.43 | 1.92 | <.001** |
| DAS | 6.47 | 3.21 | 5.80 | 2.93 | .235 |

Note: DAS = Death Anxiety Scale; FACT-G = Functional Assessment of Cancer Therapy – General

* $p < 0.05$, ** $p < 0.01$

Table 6. Time Two partial correlation matrix (controlling for Time One outcome variables).

| | Established predictor & response style variables: Time One | | |
|----------------------|--|--------|-------|
| | Avoidance | AAQ-II | IPQ |
| Outcomes: Time Two | | | |
| FACT-G Physical T2 | -.056 | .121 | -.149 |
| FACT-G Social T2 | -.207 | .332 | .252 |
| FACT-G Emotional T2 | -.339 | .110 | -.320 |
| FACT-G Functional T2 | -.241 | .442* | .363 |

* $p < 0.05$, ** $p < 0.01$. T2 = Time Two.

Note 1: AAQ-II = Acceptance and Action Questionnaire II; FACT-G = Functional Assessment of Cancer Therapy – General; IPQ = Illness Perceptions Questionnaire (assessed via Brief IPQ)

Note 2: Partial correlation analyses were limited to (1) response style variables that were significantly correlated with outcomes at Time One and (2) outcome variables demonstrating significant change over time (Time One to Time Two)

the T2 analyses only had sufficient power to detect large effects.

Discussion

This longitudinal quantitative study aimed to explore whether acceptance was related to QoL and death anxiety in cancer patients, both concurrently and prospectively. Acceptance and death anxiety were significantly and negatively associated, in line with previous literature on anxiety in cancer patients. Avoidant response styles (such as denial, behavioural disengagement, and self-distraction) showed a pattern of moderate to strong negative correlations with QoL, and significant positive correlations with death anxiety in the cancer population. Cancer appraisals demonstrated a greater number of significant correlations with response styles and outcomes than measures of physical disease characteristics. In line with previous research, this supports the role of more threatening cognitive appraisals in poorer outcomes; relationships that were not demonstrated

Table 7. Two block hierarchical regression results for predicting outcome variables at Time Two.

| Outcome variable T2 (n) | Block | Predictors entered | St. β | t | p | ΔR^2 | df | F | p |
|---------------------------|-------|--------------------|-------------|-------|------|--------------|------|------|------|
| FACT-G Social T2 (30) | 1 | IPQ | .202 | 1.28 | .210 | .341** | 2,27 | 6.98 | .004 |
| | | Social T1 | .524** | 3.33 | .003 | | | | |
| | 2 | IPQ | .262 | 1.75 | .092 | .105** | 1,26 | 4.90 | .036 |
| | | Social T1 | .323 | 1.87 | .073 | | | | |
| FACT-G Emotional T2 (31) | 1 | IPQ | -.312 | -1.79 | .084 | .264* | 2,28 | 5.03 | .014 |
| | | Emotional T1 | .311 | 1.79 | .084 | | | | |
| | 2 | IPQ | -.334 | -1.89 | .069 | .021 | 1,27 | 0.80 | .380 |
| | | Emotional T1 | .202 | 0.95 | .351 | | | | |
| FACT-G Functional T2 (31) | 1 | IPQ | .373* | 2.08 | .047 | .167 | 2,28 | 2.80 | .078 |
| | | Functional T1 | .301 | 1.67 | .105 | | | | |
| | 2 | IPQ | .388* | 2.42 | .023 | .194** | 1,27 | 8.19 | .008 |
| | | Functional T1 | .198 | 1.21 | .239 | | | | |
| FACT-G Physical T2 (30) | 1 | IPQ | -.146 | -0.74 | .463 | .099 | 2,27 | 1.49 | .243 |
| | | Physical T1 | .231 | 1.17 | .250 | | | | |
| | 2 | IPQ | -.138 | -0.69 | .496 | .011 | 1,26 | 0.33 | .570 |
| | | Physical T2 | .226 | 1.14 | .266 | | | | |
| | | AAQ-II | .107 | 0.58 | .570 | | | | |

* $p < 0.05$, ** $p < 0.01$. T2 = Time Two.

Note 1: AAQ-II = Acceptance and Action Questionnaire II; FACT-G = Functional Assessment of Cancer Therapy – General; IPQ = Illness Perceptions Questionnaire (assessed via Brief IPQ)

Note 2: Only response style variables which significantly correlated with each outcome were entered in the models. Brief IPQ and AAQ-II were entered into all models.

by or contingent upon disease characteristics alone. Contrastingly, acceptance was an independent explanatory variable for (concurrent) QoL and anxiety outcomes, in directions consistent with psychological health. Acceptance also demonstrated predictive power for these outcomes over time, over and above the influence of cancer appraisals.

In contrast to relations observed for acceptance, ‘approach coping’ demonstrated negligible-to-small, non-significant associations with QoL and death anxiety. As defined by the COPE, approach coping includes strategies that are promoted in traditional CBT (such as positive reframing and efforts to actively control and problem-solve stressors). It has been argued that such (problem-focussed) strategies are less apt for relatively uncontrollable stressors (such as cancer; Hulbert-Williams *et al.*, 2015; Park *et al.*, 2004); moreover, a recent meta-analysis of interventions for anxiety in cancer (specifically around fear of recurrence; Tauber *et al.*, 2019) found that traditional CBT was outperformed by contemporary

cognitive-behavioural interventions (including ACT) – which place greater emphasis on relating to difficult experiences with active openness and acceptance (Hayes *et al.*, 2011). Thus, the present finding – that coping strategies aligned with traditional CBT demonstrated little association with wellbeing or death anxiety, whereas active acceptance was associated with greater wellbeing and lower death anxiety – is congruent with conceptual arguments and recent empirical evidence underpinning ACT and other contemporary cognitive-behavioural intervention-models (Hayes *et al.*, 2011).

Theoretical implications

In contrast to the ‘protective’ and defensive role of avoidance posited by TMT, avoidance was significantly associated with lower QoL, and higher death anxiety. TMT suggests that avoidance (denial, suppression, and distraction) should be utilised to protect against the terror of mortality and its associated impact upon QoL; yet here the findings that avoidance was significantly associated with death anxiety and poorer QoL (in the

presence of the proximal mortality-threat of cancer) suggest the opposite.

QoL declined over time on social and functional domains, and deteriorations in these domains were predicted by lower levels of acceptance (i.e., a response-style characterised by experiential avoidance). Thus, contrary to TMT, and consistent with ACT theory, openness to experience appeared to dispose participants to better psychological outcomes over time. Of further relevance to ACT theory, it was notable that (within the present sample) functional and social QoL both declined over time, despite physical and emotional QoL improving, lending support to the ACT notion that valued living (functional and social QoL) is independent of change in physical and distress symptoms (Hulbert-Williams *et al.*, 2015).

Given that avoidant response styles did not retain significant explanatory power following the addition of the acceptance measure, it is likely that avoidant responses and experiential avoidance (as measured by low AAQ-II scores) share common variance, and that this prevented avoidant response styles from achieving significance. Experiential avoidance may therefore be a generalised avoidance phenomenon, rather than a unique concept, given its large correlations with other measures of avoidant responding (Chawla & Ostafin, 2007). Acceptance, however, as measured by the AAQ-II, made a unique and statistically independent contribution as an explanatory variable: accounting for additional model variance, over and above cancer appraisals or avoidant response styles. Although these are modest percentages, fluctuations in the amount of variance explained may reflect the relevance of the variables entered in explaining outcome. For example, a large proportion of variance was explained for concurrent emotional QoL (40%, plus an additional 18% with the addition of AAQ-II in the final model), but relatively little was explained for concurrent social QoL (11% in the final model). We may therefore theorise that the way we respond to stressors – e.g. via acceptance or avoidance – can contribute to emotional outcomes, but the response styles captured here are less likely to be direct determinants of the external influencers of social QoL, such as support from family and friends. Nevertheless, response styles may still indirectly affect social support over time, e.g. by influencing whether family and friends make themselves available, or perhaps by influencing subjective appraisals of whether friends and family are available, hence the smaller degree of variance explained.

Limitations

Limitations of this study include its observational research design, and the cross-sectional nature of the data collected at time-one, which was subject to the limitations of correlational,

multivariate data analyses and the non-causal conclusions that are drawn from them. Inclusion of data at a second timepoint partially addressed these limitations but was limited by attrition (only large effects could be detected at follow-up).

Time since diagnosis was not accurately captured, as it has been elsewhere in cancer literature (e.g. Hulbert-Williams *et al.*, 2015). A further limitation may be posed by the use of the AAQ-II, as items may be conflated with distress outcomes (Wolgast, 2014). Although the AAQ-II was used as a process measure indicative of acceptance, with implications for targeted assessment and intervention in this process, the observed relationships with outcomes may be artificially inflated by overlapping content and weak discriminant construct validity. However, use of the AAQ-II is well-established in the ACT literature, and has been deemed to be of satisfactory reliability and validity in research with cancer populations (Feros *et al.*, 2013).

Conclusions

Acceptance is supported as a helpful response style, and a potential target for intervention in psychological work with cancer patients. Psychological interventions targeting acceptance are also supported over and above those directed towards illness appraisals in cancer patients, which were some what correlated with distress outcomes but had less predictive and explanatory power. Results also showed that many response styles that might be targeted in more traditional, often appraisal-focused, work such as CBT or expressive therapies, are unlikely to be associated with positive outcomes in cancer patients. Such strategies include active coping, emotional support, planning, positive reframing, and venting. As experiential avoidance and avoidant response styles had greater predictive power than cancer appraisals in QoL and death anxiety outcomes, increasing acceptance and shifting relationships to distressing cognitions, rather than attempting to modify their content, gives a clear direction for future intervention studies with this population.

Data availability

Underlying data

Open Science Framework: Accepting the unacceptable? <https://doi.org/10.17605/OSF.IO/XSTZF> (Moghaddam, 2020)

This project contains the following underlying data:

- Data - exploring acceptance in a cancer population. sav (Participants level data on questionnaire battery responses)

Data are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

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Elisabeth Andritsch

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The main goal of this manuscript was to evaluate the link between acceptance, better quality of life and death anxiety in cancer patients. Moreover, the authors assessed the possible impact of the disease's attributions and response-styles in relation to cancer patients' quality of life and death anxiety. Further, a longitudinal analysis of acceptance, quality of life and death anxiety was performed. A total of 72 patients were in the first analysis and the follow up sample size was 31. Descriptive and correlational statistics followed by hierarchical linear regressions were used to examine authors assumptions. In addition, t-tests were employed to assess a difference between two study time points.

The authors interpreted results of this study as establishing acceptance as a predictor of quality of life and death anxiety in cancer patients. Furthermore, avoidant coping styles have been related to increased levels of death anxiety and diminished quality of life.

The manuscript is well written, the study aims are clearly stated and the theoretical background presents well the current state of research. The good balance between introduction and discussion in term of references has been achieved.

My minor criticisms of the present paper are listed below.

1. To my read, the abstract is somewhat confusing regarding the methods part. Also, it would be beneficial for readers to know which analyses were performed.
2. In the introduction, the authors refer to some research, suggesting that the severity of disease and cancer type influence death anxiety and quality of life in cancer patients. Therefore, I might suggest controlling for these variables.
3. Please, report the internal reliability of all the instruments (also for the present sample).
4. Could you please provide the reasons for half of participants to refuse to take part in the

follow-up?

5. One of the assumptions for the hierarchical linear regression includes that multicollinearity does not exist or is only present at very low levels. Please, adapt your analyses taking into account the high correlation between avoidance coping and acceptance.
6. Please, report the results from the hierarchical regressions in more detailed way. Especially model summary of hierarchical multiple regression would be helpful (Adjusted R², ΔR^2 , ΔF , df, Sig. ΔF) and ANOVA for all five models).

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Is the argument information presented in such a way that it can be understood by a non-academic audience?

Yes

Does the piece present solutions to actual real world challenges?

Yes

Is real-world evidence provided to support any conclusions made?

Yes

Could any solutions being offered be effectively implemented in practice?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Coping, Psychoneuroimmunology, Psychological Interventions, Quality of life, Fear of Cancer Progression

I confirm that I have read this submission and believe that I have an appropriate level of

expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 19 June 2020

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Gregor Weißflog

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The topic of the paper is an important and interesting subject of investigation: coping with cancer as a life-threatening disease. The title of manuscript "*Accepting the unacceptable? Exploring how acceptance relates to quality of life and death anxiety in a cancer population*" is well chosen for the content of the manuscript.

The introduction of the relevant constructs is clearly and accurately presented. Current literature is cited. The findings of Gillanders *et al.*, 2015 (included as reference in the methods section of the manuscript) should be discussed within the introduction due the fact that – in my opinion - this work is relevant for your research question.

Optional further ACT in long-term conditions (incl. cancer) populations references could be Graham *et al.* (doi: 10.1016/j.cpr.2016.04.009¹) and the work Hawkes and their group (doi: 10.1200/JCO.2012.45.5873²; doi: 10.1007/s12160-014-9610-2³).

Regarding ACT, maybe the differentiation between primary and secondary suffering could be added for the readers that are unfamiliar with 3rd wave behaviour therapy including ACT. In my opinion, this is very plausible within the context of cancer disease. Primary suffering is any unpleasant physical sensations you may experience as a consequence of cancer itself, treatment, side effects, fatigue etc. You may not be able to do anything about this level of suffering and the task is to accept it. Secondary suffering is the human anguish we all experience as a reaction to primary suffering: feelings like anger, fear, depression, anxiety and despair. With acceptance we can learn to modify and reduce these experiences of secondary suffering. This can improve our quality of life, even if the primary suffering remains unchanged, or even worsens.

The study design is appropriate and the work is technically sound. The authors use well established self-report instruments for the assessment of all constructs (Brief IPQ, AAQ-II, Brief COPE, FACT-G, DAS). The details of methods and analysis are described in detail and allow replication by others. Again, the clear and precise writing is a major strength of the submitted manuscript. Just a formal aspect: Within the presentation of the AAQ, please change "cceptance" to "acceptance".

My major methodological concern relates to the interpretation of the regression analyses. Within table 3, all relevant intercorrelations are presented. I choose the association between Acceptance

(AAQ-II) and Avoidance coping with $r=0.71$. These both variables you enter as predictors into one regression model. It is very likely that you have a problem with multicollinearity. It is very necessary that you check this by calculating e.g. the variance inflation factor or another parameter for checking this issue. Please add according sequences in the method and result section (I am glad that you provide complete intercorrelation matrix; others authors do not!). Within the discussion (limitations) section, it could be necessary to rewrite your discussion of the regression results after checking multicollinearity. In general, the wording of the conclusions is appropriate. Limitations: times since diagnosis would be interesting as the authors say. It is very positive that data underlying the results are online available.

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Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Is the argument information presented in such a way that it can be understood by a non-academic audience?

Partly

Does the piece present solutions to actual real world challenges?

Partly

Is real-world evidence provided to support any conclusions made?

Partly

Could any solutions being offered be effectively implemented in practice?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Psycho-Oncology, Psychotherapy

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
