Internet-Based Exposure and Behavioral Activation for Complicated Grief and Rumination: A Randomized Controlled Trial

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This study examined the effectiveness and feasibility of therapist-guided Internet-delivered exposure (EX) and behavioral activation (BA) for complicated grief and rumination. Forty-seven bereaved individuals with elevated levels of complicated grief and grief rumination were randomly assigned to three conditions: EX ($N = 18$), BA ($N = 17$), or a waiting-list ($N = 12$). Treatment groups received 6 homework assignments over 6 to 8 weeks. Intention-to-treat analyses showed that EX reduced complicated grief, posttraumatic stress, depression, grief rumination, and brooding levels relative to the control group at posttreatment ($d = 0.7$–1.2). BA lowered complicated grief, posttraumatic stress, and grief rumination levels at posttreatment ($d = 0.8$–0.9). At 3-month follow-up, effects of EX were maintained on complicated grief and grief rumination ($d = 0.6$–1.2), and for BA on complicated grief, posttraumatic stress, and grief rumination ($d = 0.8$–0.9). EX reduced depression more strongly than BA ($d = 0.6$). Completers analyses corroborated results for EX, and partially those for BA, but no group differences were detected. BA suffered from high dropout (59%), relative to EX (33%) and the waiting-list (17%). Feasibility appeared higher for EX than BA. Results supported potential applicability of online exposure but not behavioral activation to decrease complicated grief and rumination.

Keywords: prolonged grief; grief therapy; rumination; exposure; behavioral activation

ALTHOUGH MOST PERSONS ADAPT to the death of a loved one without therapeutic intervention, a significant minority of bereaved individuals experiences severe

physical and mental health problems (Stroebe, Schut, & Stroebe, 2007). In approximately 5% to 10% of bereaved people, a loss results in persistent emotional difficulties, such as posttraumatic stress disorder (PTSD) and major depressive disorder (MDD). Over the past years, several scientists have attempted to define a mental disorder that is characterized by chronic grief responses, broadly termed *complicated grief* (Horowitz et al., 1997; Maercker et al., 2013; Prigerson et al., 2009). An influential proposal is prolonged grief disorder (PGD), which is characterized by persistent separation distress, difficulty accepting the loss and adjusting to its consequences, present to a distressing and disabling degree at least 6 months after the death occurred (Prigerson et al., 2009). Given the large individual differences in the outcomes of experiencing a loss, it is imperative to establish which types of treatment reduce loss-related distress.

Psychological treatments for complicated grief were found to be effective, yielding moderate effect sizes in a meta-analysis (Wittouck, van Autreve, de Jaegere, Portzky, & van Heeringen, 2011). Moreover, there is accumulating evidence that cognitive behavioral therapy (CBT) is a promising therapeutic intervention for complicated grief (Boelen, de Keijser, van den Hout, & van den Bout, 2007; Bryant et al., 2014; Litz et al., 2014; Papa, Sewell, Garrison-Diehn, & Rummel, 2013; Rosner, Pfoh, Kotoučová, & Hagl, 2014; Shear, Frank, Houck, & Reynolds, 2005; Wagner, Knaevelsrud, & Maercker, 2006). CBT for complicated grief typically consists of multiple components, including, but not limited to: (a) exposure to avoided bereavement-related cues; (b) cognitive restructuring of loss-related negative cognitions; and/or (c) behavioral activation to counter inactivity and behavioral withdrawal.

Despite the proven effectiveness of CBT in reducing loss-related distress, little is known about the potential of online applications of this approach. This is somewhat surprising, because online therapy has been shown to be as effective as face-to-face therapy for various affective disorders (e.g., Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). Moreover, Internet-delivered therapy could provide an easily accessible and potentially cost-effective and time-efficient way of providing help to bereaved individuals who have difficulty adjusting to their loss. Since governments and insurance companies increasingly stress the need for brief, evidence-based interventions to reduce mental health complaints, the development of these online interventions is important.

The limited research on online CBT interventions for bereaved individuals that has been done so far provides a mixed picture. For example, therapist-guided Internet-delivered CBT for complicated grief was effective in reducing loss-related distress (Wagner et al., 2006), but an unguided online CBT-based writing intervention for a general bereaved population was not (van der Houwen, Schut, van den Bout, Stroebe, & Stroebe, 2010). These findings suggest that in addition to targeting indicated groups of bereaved persons (for a review: Wagner, 2013), some degree of therapist support is necessary to make online therapy optimally effective (for reviews: Andersson, Carlbring, Berger, Almlöv, & Cuijpers, 2009; Wagner, 2013). In the current study, we therefore set out to further investigate the effectiveness of therapist-supported online therapy for people with elevated levels of complicated grief.

Another issue that has been given scant attention in research on CBT for distressed bereaved persons is the effectiveness of individual treatment components. Given the need for cost-effective and time-efficient therapies, it is worth investigating whether beneficial effects on levels of loss-related distress can be attained through application of a single treatment component instead of a combination of multiple modules. This is especially relevant given that dismantled treatments, consisting of single modules, generally yield similar results to full treatments (Bell, Marcus, & Goodlad, 2013). A rare study that did investigate the effectiveness of separate components of CBT for complicated grief yielded some interesting findings. Boelen and colleagues (2007) compared the effects of three conditions. In the first condition, a 6-week exposure module was followed by a 6-week cognitive restructuring module. In the second condition, the sequence of modules was reversed, and in the third condition, a 12-week supportive counseling module was provided. Notably, both exposure and cognitive restructuring yielded moderate to large reductions in symptoms of complicated grief after only 6 weeks. Unfortunately, the design of this study did not permit examination of long-term effects of these treatment components. Clearly, it is important to investigate what the effects of individual treatment modules are, as this could be a way to develop shorter, more efficient treatments for bereaved individuals experiencing grief complications.

Accordingly, in the current investigation, we sought to complement prior studies by testing two brief, therapist-supported, Internet-delivered therapy modules in a sample of bereaved persons with elevated levels of complicated grief. We chose to examine the effects of exposure and behavioral activation for a number of reasons. A first reason was that both interventions are based on a clear conceptual basis. Exposure is grounded in the notion that individuals experiencing complications in their grieving process engage in overt or cognitive avoidance of the loss

(e.g., Boelen & van den Bout, 2010; Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Eisma et al., 2013). Such avoidance strategies are hypothesized to block integration of the loss in the autobiographical knowledge base (Boelen, van den Hout, & van den Bout, 2006) and/or acceptance of the loss (Stroebe, Boelen, van den Hout, Stroebe, Salemink and van den Bout, 2007; Worden, 2009). Therefore, systematically confronting a bereaved person with the most painful aspects of the reality of the loss could increase acceptance of the loss and facilitate adjustment to bereavement. Behavioral activation, on the other hand, is founded on the observation that individuals experiencing grief complications may become more inactive and withdraw social, occupational, and recreational activities (Boelen et al., 2006; Boelen & Eisma, in press; Boelen & van den Bout, 2010). This results in reduced opportunities to challenge negative cognitions that are common after loss, which fuels negative feelings and grief complications. Therefore, it is proposed that encouraging bereaved individuals to engage in activities perceived to be both meaningful and important can disconfirm negative cognitions and increase positive mood, thereby reducing pathological grief responses.

A related reason to study exposure and behavioral activation is that there is some evidence for the effectiveness of both techniques to reduce post-loss psychopathology. As mentioned, exposure is an integral part of many effective contemporary CBT interventions (e.g., Boelen et al., 2007; Shear et al., 2005; Wagner et al., 2006). Recently, a pilot randomized trial showed that behavioral activation could potentially be as effective as a stand-alone therapy for complicated grief. Relative to a waiting list control group, behavioral activation caused large reductions in depression, posttraumatic stress, and complicated grief symptoms (Papa, Sewell, et al., 2013).

A third important reason for studying exposure and behavioral activation is that both techniques are a potentially effective way to reduce rumination. Rumination, thinking repetitively and recurrently about the causes and consequences of a loss and loss-related emotions, maintains mental health problems after bereavement (for reviews: Eisma, Stroebe, et al., 2014; Nolen-Hoeksema, 2001). Traditionally, behavioral activation has been advocated as a method to reduce rumination because it diverts attention from ruminative thinking and increases positive thoughts and feelings (e.g., Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). A recent study showed rumination and behavioral withdrawal after loss are indeed related (Eisma et al., 2013). Furthermore, two case studies of bereaved individuals who took part in behavioral activation

therapy showed reductions in rumination after treatment and at 3- and 6-month follow-up (Papa, Rummel, Garrison-Diehn, & Sewell, 2013).

Exposure therapy has similarly been suggested to ameliorate rumination, because it reduces avoidance behavior. Several grief researchers have hypothesized that rumination after bereavement serves as a way to avoid painful aspects of the reality of the loss (Boelen et al., 2006; Eisma et al., 2013; Stroebe, Boelen, et al., 2007). Studies in bereaved samples have confirmed a cross-sectional and prospective association between rumination and cognitive and/or emotional avoidance (e.g., Eisma et al., 2013; Eisma, Schut, et al., 2014; Morina, 2011). If rumination is indeed a cognitive avoidance strategy, exposure techniques would be a viable way to reduce rumination. Thus, studying the effects of exposure therapy and behavioral activation provides us with an opportunity to enhance knowledge about the potential working mechanisms of rumination after loss.

In the current investigation, we compared the effects of a brief Internet-based exposure and brief Internet-based behavioral activation module against a waiting-list control group in a bereaved sample with elevated levels of complicated grief and rumination. Our first hypothesis was that exposure and behavioral activation would both reduce symptom levels of complicated grief and grief rumination compared to the control group at posttreatment and at 3-month follow-up. Our second hypothesis was that both modules would reduce symptom levels of other types of psychopathology (i.e., posttraumatic stress, depression, anxiety) and depressive rumination (i.e., brooding and reflection; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Additionally, we compared the effects of both interventions on all outcome measures at posttest and follow-up. Since both exposure and behavioral activation showed moderate to strong effects on psychopathology symptom levels in previous research (e.g., Boelen et al., 2007; Papa, Sewell, et al., 2013), we made no predictions on which treatment would be more effective. We also assessed and compared the feasibility (i.e., acceptability and client satisfaction) of both interventions.

Method

STUDY DESIGN

Ethical approval for the present study was provided by an official Dutch Ethical Review Board. Participants were recruited through advertisements on websites and Facebook pages of organizations for bereaved individuals, and on the content network of Google from May 2013 through January 2014. People who were interested in participation could link through to a website specifically designed for the

current project. On this website they could read general information about the study (e.g., on goals of the study, data handling, privacy, anonymity, etc.), fill out a screening questionnaire, and provide contact information. People were eligible for participation if they had lost a first-degree relative more than 6 months previously (cf. Prigerson et al., 2009) and reported elevated levels of complicated grief (i.e., a score > 25) on the Inventory of Complicated Grief (ICG; cf. Prigerson et al., 1995) and elevated grief rumination (i.e., a score > 40) on the Utrecht Grief Rumination Scale (UGRS; Eisma, Stroebe, et al., 2014). Additionally, participants should comprehend Dutch, have private access to a computer, and the ability to conduct basic computer tasks (e.g., e-mailing, using MS Word). Exclusion criteria were: current suicidal plans (i.e., people with mild suicidal ideation were not excluded), past or current psychosis or schizophrenia, and past or current episodes of dissociation or dissociative disorder (cf. Wagner, 2013).

People who met study criteria were sent a personalized information letter and an informed consent form by e-mail and by post. Individuals who were still interested in participation after reading the information letter were asked to e-mail the researcher in charge of the execution of the study within 2 weeks. After indicating interest in the study by e-mail, a person was called by phone for an intake interview. During this intake interview in- and exclusion criteria were checked again, potential participants could ask questions about the study, and received detailed information about practical issues. Individuals who wished to participate after the intake procedure gave informed consent over the phone and were requested to fill out the informed consent form and to return it by post. Each participant was randomized (simple randomization) in one of our three conditions with a ratio of 3 (exposure) : 3 (behavioral activation) : 2 (waiting list) (cf. Boelen et al., 2007). The participants in all groups were offered a possibility to enter one of the online treatments or a face-to-face treatment after completing participation in our study.

PARTICIPANTS

In total, 433 persons started filling out the online screening questionnaire. Of this group, 114 individuals were eligible for participation (i.e., met inclusion criteria and did not meet at least one exclusion criterion) and were sent more information. Sixty-seven persons declined participation (either by declining explicitly or by not responding to our message). Forty-seven persons were finally allocated to one of three conditions. Table 1 shows the baseline characteristics of this final sample (for group comparisons see Results). Figure 1 shows a flowchart of participants.

TREATMENT CONDITIONS

Each treatment consisted of 6 manual-based e-mailed homework assignments, which were completed over a period of 6 to 8 weeks. Each homework assignment could be completed in 1 week. After each assignment the therapist provided feedback. This feedback was primarily focused on explaining homework and maximizing treatment adherence. For example,

Table 1
Sample characteristics

	Exposure N = 18	Activation N = 17	Control N = 12	Total N = 47
Demographic characteristics				
Gender (N (%))				
Female	15 (83.3)	16 (94.1)	12 (100.0)	43 (91.5)
Age in years (M (SD))	49.9 (10.8)	44.4 (13.8)	41.3 (14.6)	45.7 (12.9)
Education level (N (%))				
Lower education	5 (27.8)	7 (41.2)	7 (58.3)	19 (40.4)
Higher education	13 (72.2)	10 (58.8)	5 (41.7)	28 (59.6)
Loss-related characteristics				
Deceased is (N (%))				
Partner	9 (50.0)	6 (35.3)	4 (33.3)	19 (40.4)
Other	9 (50.0)	11 (64.7)	8 (66.7)	28 (59.6)
Cause of loss (N (%))				
Non-violent	14 (77.8)	15 (88.2)	8 (66.7)	37 (78.7)
Violent	4 (22.2)	2 (11.8)	4 (33.3)	10 (22.8)
Time since loss (M (SD))	26.0 (13.0)	32.4 (47.8)	24.4 (12.2)	31.0 (45.1)

Note. Lower education = primary school, high school or vocational school. Higher education = college or university. Other = child, sibling or parent.
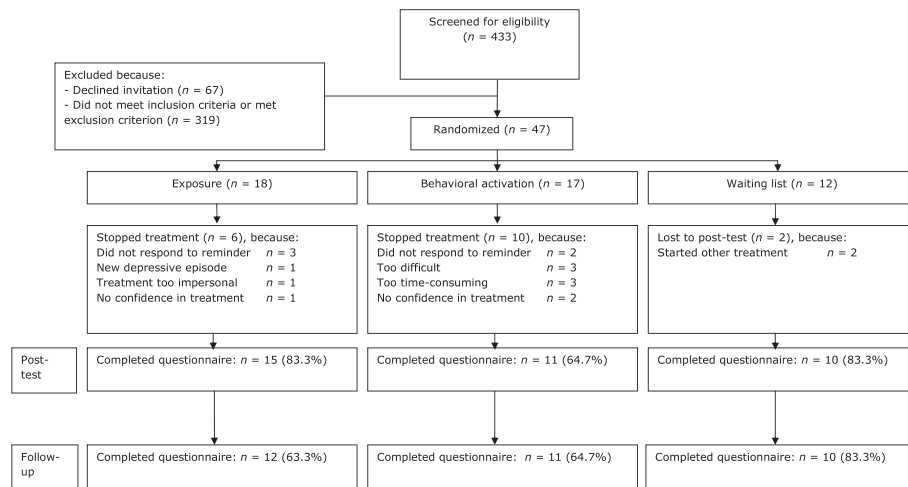
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                              ┌─────────────────────────┐
                              │  Screened for eligibility │
                              │      (n = 433)           │
                              └─────────────────────────┘
  ┌──────────────────────────────────┐
  │ Excluded because:                │
  │ - Declined invitation (n = 67)   │
  │ - Did not meet inclusion criteria or met │
  │   exclusion criterion (n = 319)  │
  └──────────────────────────────────┘
                              ┌─────────────────────────┐
                              │   Randomized (n = 47)    │
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Exposure (n = 18)	Behavioral activation (n = 17)	Waiting list (n = 12)
Stopped treatment (n = 6), because: Did not respond to reminder n = 3 New depressive episode n = 1 Treatment too impersonal n = 1 No confidence in treatment n = 1	Stopped treatment (n = 10), because: Did not respond to reminder n = 2 Too difficult n = 3 Too time-consuming n = 3 No confidence in treatment n = 2	Lost to post-test (n = 2), because: Started other treatment n = 2

	Exposure	Behavioral activation	Waiting list
Post-test	Completed questionnaire: n = 15 (83.3%)	Completed questionnaire: n = 11 (64.7%)	Completed questionnaire: n = 10 (83.3%)
Follow-up	Completed questionnaire: n = 12 (63.3%)	Completed questionnaire: n = 11 (64.7%)	Completed questionnaire: n = 10 (83.3%)

FIGURE 1   Flowchart of participants through the study.

when necessary, the therapist would explain more about the goal of an assignment and what the best way is to execute it, or the therapist would motivate the participant by complimenting him or her with progress. In total, the therapist spent a maximum of 1 hour per week on sending assignments and giving feedback.

Exposure

Exposure is based on the idea that avoidance of reminders of painful aspects of the loss is a central maintaining factor in the development and maintenance of complicated grief. This treatment is focused on reducing such avoidance behavior by gradually exposing individuals to the most aversive aspects of the loss. Our exposure protocol was based on the protocol used by Boelen and colleagues (2007), and was adapted for online administration. The main reason for choosing this protocol was that it is a "pure" exposure module, not including any other interventions, that was previously effectively applied to target complicated grief. In the first week of treatment, individuals received a detailed rationale of the therapy. As a first homework assignment, participants were asked to list situations, objects, or memories related to the loss that they tended to avoid in daily life. Furthermore, they were requested to list any behavior that they recurrently engage in to maintain the bond with the deceased. In the subsequent homework sessions, participants were encouraged to gradually expose themselves to those aspects of the loss that they tended to avoid most, or, alternatively, to gradually reduce excessive behavior that maintained the bond with the deceased. This was achieved by engaging in a combination of writing assignments and imaginal and/or in-vivo exposure exercises.

Behavioral Activation

Behavioral activation is based on the idea that avoidance of activities that could foster positive mood is a maintaining factor in complicated grief. This intervention is aimed at increasing the number of meaningful and fulfilling activities that individuals undertake. Our protocol was based on the brief behavioral activation for depression protocol developed by Lejuez, Hopko, Acierno, Daughters, and Potago (2011). The reason for choosing this protocol was that it was shown to be effective in reducing depression and that it focused exclusively on gradual activation; that is, it contained no additional treatment components, such as cognitive therapy modules (cf. Martell et al., 2001). This protocol was shortened and adjusted to be more suitable for online administration in a bereaved population. In the first week, participants received a detailed rationale for this form of therapy. As a first homework assignment, they were requested to keep a 7-day activity diary, in which they indicated how pleasurable and important they found the activities they undertook during these days. In the subsequent homework assignments, participants were encouraged to continue keeping a diary, identify their core values, and to develop new meaningful and pleasurable activities based on these values. Ultimately, the goal of the intervention was to gradually engage in more of these value-based activities, while reducing the number of activities that were experienced as unimportant and unfulfilling.

THERAPISTS AND TREATMENT ADHERENCE

Therapy was administered by two licensed clinical psychologists, with post-university training in CBT. For the purpose of the study, they received an additional 2-day training in Internet-delivered

exposure therapy and behavioral activation for complicated grief. Each therapist delivered both types of therapy. Therapies were described in detailed session-by-session protocols to maintain treatment fidelity. In addition, regular peer-to-peer coaching and supervision meetings were held to ensure protocol adherence.

INSTRUMENTS

Questionnaires were administered at four time-points. First, in the screening questionnaire, we assessed demographic and loss-related variables and assessed current levels of complicated grief symptoms and grief-related rumination. At pre, post and 3-month follow-up measurement we assessed symptom levels of depression, anxiety, posttraumatic stress, and complicated grief and grief rumination and depressive rumination (i.e., brooding, reflection). Additionally, at post-measurement, a questionnaire on the feasibility of treatment was administered in the treatment groups, but not in the control group. Each measurement instrument is described below.

Demographic and Loss-Related Variables
A self-constructed questionnaire was used to assess demographic variables (i.e., age, gender, education level) and loss-related variables (i.e., time since loss, gender of the deceased, kinship, cause of death, expectedness of the loss) and in- and exclusion criteria (e.g., suicidal plans, psychiatric diagnoses, computer access, computer skills).

Complicated Grief Symptoms
Symptoms of complicated grief were assessed with the Inventory of Complicated Grief-Revised (ICG-R; Prigerson & Jacobs, 2001; Dutch version: Boelen, van den Bout, de Keijser, & Hoijtink, 2003). The Dutch ICG-R consists of 29 items measuring complicated grief symptoms. Participants could indicate how frequently they had experienced these symptoms during the past month on a 5-point scale ranging from 0 (*almost never*) to 4 (*always*). Studies in subclinical samples of bereaved individuals supported the reliability ($\alpha = .94$) and validity of the ICG-R (Boelen et al., 2003). Notably, our cutoff score for participation (>25) was calculated by summing 19 items from the original Inventory of Complicated Grief (ICG; Prigerson et al., 1995), which are included in the ICG-R. Bereaved individuals with ICG scores higher than 25 on average experience more impairment in social, general, mental, and physical health than bereaved persons with ICG scores of 25 or lower (Prigerson et al., 1995).

Posttraumatic Stress Symptoms
We assessed PTSD symptoms using the PTSD Symptom Scale (PSS; Foa, Cashman, Jaycox, & Perry, 1997; Dutch version: Engelhard, Arntz, & van den Hout, 2007). The PSS consists of 17 statements about PTSD symptoms, based on the DSM-IV PTSD criteria (American Psychiatric Association, 2000). Participants indicated how frequently they experienced each symptom in response to the loss during the past month, on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*almost always*). The PSS showed good reliability ($\alpha = .85$) and acceptable validity in a sample with a heterogeneous trauma history (Engelhard et al., 2007).

Anxiety and Depressive Symptoms
Symptoms of anxiety and depression were measured with the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; Dutch version: Spinhoven et al., 1997). The HADS consists of 7 statements that tap anxious symptoms and 7 statements that tap depressive symptoms. Participants indicated how often / to what extent they have experienced these symptoms in the past week on 4-point scales. Research in several Dutch samples, including community samples, supported the reliability ($\alpha = .71 - .90$) and validity of the HADS subscales (Spinhoven et al., 1997).

Grief Rumination
The 15-item Utrecht Grief Rumination Scale (UGRS; Eisma, Stroebe, et al., 2014) was used to measure grief-related rumination, recurrent and repetitive thinking about the causes and consequences of the loss and loss-related emotions. Participants indicated how often they had experienced certain thoughts during the past month on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). Several studies have shown that the UGRS is a reliable ($\alpha = .87 - .91$) and valid measure of grief-related rumination (Eisma et al., 2012; Eisma, Stroebe, et al., 2014).

Depressive Rumination
We used the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Dutch version: Schoofs, Hermans, & Raes, 2010) to measure depressive rumination. Two 5-item subscales—"brooding" and "reflection"— of the RRS, hypothesized to show no content overlap with depression, were used (Treynor et al., 2003). Respondents indicated how often they exhibited certain behavior when they feel sad, blue, or depressed on a 4-point scale, ranging from 1 (*never*) to 4 (*almost always*). Research in nonclinical samples supported the Dutch RRS brooding and reflection subscales' reliability ($\alpha = .75–.78$) and validity (Schoofs et al., 2010).

Feasibility
Feasibility of the treatments was assessed by six statements about the comprehensibility of instructions and homework assignments, the extent to

which one felt understood by the therapist, general feasibility and usefulness of the treatment, and satisfaction with the treatment. Each participant indicated the extent to which they agreed with each statement (sample items: "I understood the instructions I received during treatment"; "I felt my therapist understood me"; "the treatment was feasible") on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*) (cf. Spuij, van Londen-Huijberts, & Boelen, 2013). The reliability of the feasibility scale was excellent, α = .93.

POWER ANALYSES

A conservative power analysis ($d = 0.5$, power = 0.80) before starting this project showed 98 participants were needed to detect Time × Group interaction effects in a repeated-measures MANOVA with three groups across two time-points. Due to practical problems, our present sample was considerably smaller ($n = 47$, intention-to-treat / $n = 29$, completers). Therefore, we decided to calculate Time × Group interaction effects with two groups across two time-points for each dependent variable. In the completers analyses, we had a power of 0.80 to detect interaction effects of $d = 0.65$ when comparing the exposure versus the control group, and interaction effects of $d = 0.75$ when comparing the behavioral activation versus the control group or the exposure group.

STATISTICAL ANALYSES

For our intention-to-treat analyses, we conducted multilevel regression analyses including time (premeasurement vs. postmeasurement or premeasurement vs. follow-up), group (exposure vs. control or behavioral activation vs. control) and Time × Group interactions as predictors of levels of psychopathology (i.e., complicated grief, posttraumatic stress disorder, depression, anxiety) and levels of rumination (i.e., grief rumination, brooding, reflection). Multilevel regression analysis is an intention-to-treat procedure that allows participants with only one measurement moment in the analyses (Hox, 2002). Little (1995) has shown that multilevel shows unbiased estimates when the panel attrition follows a pattern of missing at random (MAR). This approach is superior to traditional methods of dealing with dropout in treatment designs, such as last observation carried forward, as these may lead to biased estimates, and in some cases result in a bias in favor of the alternative hypothesis (Streiner, 2008). All multilevel regression analyses were conducted with MLwiN 2.24.

In addition to intention-to-treat analyses we also conducted completers analyses, including only observed data of participants who had completed

at least 4 out of 6 homework assignments, which we regarded as having received an adequate "dose" of treatment.[1] Completers analyses were also conducted with multilevel regression analyses. All other analyses reported in this manuscript were conducted with SPSS 20.0.

Cohen's *d*'s were calculated as a measure of effect size for all dependent variables on the observed data and the completers data. Within-group Cohen's *d*'s were calculated by deducting the mean score on a dependent variable on postmeasurement (or follow-up) from the mean score at premeasurement, divided by the pooled standard deviation, for each group. Between-group Cohen's *d*'s were computed by dividing the difference in change scores of groups across time by the pooled standard deviation of both groups at baseline. This method for calculating effect sizes for differences between treatment and control groups over time is comparatively low on bias, high on precision, and robust to heterogeneity in variance (Morris, 2008). Cohen (1988) considered an effect of 0.2 to be small, 0.5 to be medium, and an effect of 0.8 to be large. We used a two-sided significance level (α = . 05) for all analyses. Main analyses were corrected for baseline differences between each treatment group and the control group.

Results

PRELIMINARY ANALYSES

Randomization Check
Before conducting the main analyses, we performed a randomization check by comparing all groups at baseline on all variables using chi-square tests and ANOVAs. No baseline group differences were found on demographic and loss-related variables, or on levels of complicated grief, posttraumatic stress, anxiety, grief rumination and reflection. However, we did find significant baseline differences between groups on depressive symptoms, $F(2, 44) = 3.49$, $p = .04$, and brooding, $F(2, 44) = 5.26$, $p = .01$. Post-hoc tests revealed that the behavioral activation group scored higher on depressive symptoms, $t(27) = 2.44$, $p = .02$, $d = 0.9$, and brooding than the control group, $t(27) = 2.96$, $p = .01$, $d = 1.1$, and higher on brooding than the exposure group, $t(33) = 2.12$, $p = .04$, $d = 0.7$. Depressive symptoms and brooding were therefore used as covariates in the main analyses comparing behavioral activation

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[1] In both treatment groups the behavior proposed to reduce complicated grief and rumination (e.g., approach of avoided material, undertaking new activities) was engaged in before or in the fourth week of the intervention. Participants who completed 4 assignments could thus be assumed to understand and have experience in applying the most important new behavior.

against the control group, and brooding was used as a covariate in main analyses comparing exposure against behavioral activation.

Dropout and Nonresponse

If participants in the treatment groups completed less than 4 homework assignments, they were regarded as dropouts. In total, a notable 10 out of 17 participants (58.8%) dropped out during treatment in the behavioral activation group, and 6 out of 18 (33.3%) in the exposure group. Figure 1 shows the flowchart with reasons for dropout. Nonresponse rates were as follows: Three out of 18 participants (16.7%) in the exposure condition did not complete the post-test, and 6 (33.3%) did not complete the follow-up. Six out of 17 participants (35.3%) in the behavioral activation condition and 2 out of 12 participants (16.7%) in the waiting-list condition did not fill out postmeasurement and follow-up questionnaires. We found no differences between completers and dropouts on demographic and loss-related variables, or symptom and rumination levels. Although dropout appeared highest in the behavioral activation group, a chi-square test did not indicate a significant group difference on dropout, $\chi^2(2) = 3.95$, $p = .14$.

Feasibility

All participants who filled out the postmeasurement were included in our feasibility analysis, that is, 15 people from the exposure group (12 completers) and 11 people from the behavioral activation group (7 completers). Participants in the exposure condition indicated that they understood the study information (Mean = 4.67 , SD = 0.60, agree/strongly agree = 93.3%) and homework assignments (Mean = 4.67, SD = 0.48, agree/strongly agree = 100.0%). They also reported that their therapist understood them (Mean = 4.36, SD = 0.63, agree/strongly agree = 92.9%). A majority of participants in this group agreed that the treatment was useful (Mean = 4.00, SD = 1.17, agree/strongly agree = 64.3%), feasible (Mean = 4.21, SD = 1.05, agree/strongly agree = 85.7%), and satisfactory (Mean = 3.86, SD = 0.95, agree/strongly agree = 64.3%). Behavioral activation participants also reported that they understood study information (Mean = 4.64, SD = 0.51, agree/strongly agree = 100.0%) and homework assignments (Mean = 4.27, SD = 0.78, agree/strongly agree = 81.8%). They also indicated that their therapist understood them (Mean = 4.13, SD = 0.94, agree/strongly agree = 81.8%). However, people in the behavioral activation group did not consistently agree with the statements that the treatment was useful, feasible and satisfactory (all Means = 3.64, SD's = 1.21, agree/strongly agree = 45.5%, 63.6%, 45.5%, respectively). This is note-

worthy, particularly since 6 participants from the behavioral activation group were not included in these analyses, 4 of whom discontinued treatment because they found the assignments too difficult or time-consuming (see Figure 1). Despite a moderate effect, a significant group difference on feasibility was not detected, $t(23) = 1.08$, $p = .29$, $d = 0.5$.

MAIN ANALYSES

Intention-to-Treat Analyses

Table 2, Table 3, and Table 4 show the intention-to-treat multilevel regression analyses on the data from all participants who were initially allocated to one of our three groups. The tables with observed means and standard deviations and corresponding within- and between-group effect sizes are available as an online supplement.

Treatment Effects for Exposure Therapy at Posttest and Follow-up

At postmeasurement, between-group interaction effects (Time × Group) showed that exposure reduced symptoms of complicated grief ($p = .02$, $d = 0.8$), posttraumatic stress ($p = .003$, $d = 1.0$) and depression ($p = .03$, $d = 0.7$), and levels of grief rumination ($p = .02$, $d = 1.2$) and depressive brooding ($p < .001$, $d = 1.0$), compared to the control group. No significant interaction effects were found for anxiety ($p = .06$, $d = 0.4$) and depressive reflection ($p = .25$, $d = 0.3$).

At follow-up measurement, between-group interaction effects (Time × Group) showed that treatment effects of exposure therapy were maintained for complicated grief symptoms ($p = .048$, $d = 0.6$) and grief rumination ($p = .003$, $d = 1.2$). Additionally, a significant interaction effect was found on depressive reflection ($p = .02$, $d = 0.8$). However, no significant effects emerged for levels of posttraumatic stress ($p = .16$, $d = 0.5$), depression ($p = .27$, $d = 0.2$), anxiety ($p = .20$, $d = 0.4$) and depressive brooding ($p = .056$, $d = 0.7$).

Treatment Effects for Behavioral Activation at Posttest and Follow-up

Behavioral activation showed significant between-group interaction effects (Time × Group) for symptom levels of complicated grief ($p = .008$, $d = 0.9$) and posttraumatic stress disorder ($p = .003$, $d = 0.8$), and for grief rumination ($p = .01$, $d = 0.8$) and depressive reflection ($p = .03$, $d = 0.5$). However, behavioral activation did not significantly ameliorate depression ($p = .57$, $d = 0.3$), anxiety ($p = .08$, $d = 0.5$) or depressive brooding ($p = .29$, $d = 0.8$).

Effects for behavioral activation were maintained at follow-up for symptoms of complicated grief ($p = .003$, $d = 0.9$) and posttraumatic stress disorder

Table 2

Multilevel Regression Intention-to-Treat Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and 3-Month Follow-Up (Model 2) Exposure Versus Control Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	57.17	(5.23)**	37.67	(2.13)**	8.75	(1.31)**	11.00	(1.11)**	43.5	(2.56)**	9.83	(0.83)**	9.08	(0.79)**
Time (T1 vs. T2)	1.99	(4.69)	1.85	(1.88)	0.11	(1.09)	0.274	(0.87)	0.56	(3.05)	1.40	(0.70)*	0.02	(0.77)
Between														
Group (Ex vs. Co)	5.11	(6.76)	-0.33	(2.75)	2.36	(1.69)	-0.06	(1.43)	2.61	(3.31)	1.44	(1.08)	1.92	(1.01)
Time × Group	-14.42	(6.06)*	-7.18	(2.43)**	-3.20	(1.41)*	-2.10	(1.12)†	-9.59	(3.94)*	-3.02	(0.90)**	-1.16	(1.00)
Model 2														
Within														
Constant	57.17	(5.15)**	37.67	(2.12)**	8.75	(1.27)**	11.00	(1.17)**	43.5	(2.29)**	9.83	(0.78)**	9.08	(0.75)**
Time (T1 vs. T3)	-2.20	(2.31)	-1.35	(1.05)	-1.17	(0.46)*	-0.56	(0.50)	-2.08	(1.19)	-0.33	(0.42)	0.30	(0.40)
Between														
Group (Ex vs. Co)	5.11	(6.65)	-0.33	(2.74)	2.36	(1.64)	-0.06	(1.51)	2.61	(2.97)	1.44	(1.01)	1.92	(0.96)
Time × Group	-6.15	(3.11)*	-1.96	(1.41)	-0.68	(0.62)	-0.87	(0.68)	-4.83	(1.60)**	-1.07	(0.56)†	-1.25	(0.53)*

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up. Ex = exposure therapy. Co = waiting list control group. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

Table 3

Multilevel Regression Intention-to-Treat Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and Follow-Up (Model 2) Behavioral Activation Versus Control Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	66.22	(4.17)**	42.04	(1.87)**	10.27	(1.18)**	13.11	(1.06)**	47.78	(2.47)**	10.93	(0.86)**	10.08	(0.65)**
Time (T1 vs. T2)	-1.68	(1.96)	1.07	(0.94)	1.15	(0.45)*	-0.49	(0.43)	-1.88	(1.12)	-0.26	(0.42)	-0.24	(0.32)
Between														
Brooding T1	1.26	(0.83)	0.54	(0.37)	0.58	(0.23)*	0.59	(0.21)**	0.76	(0.49)	-	-	0.24	(0.13)*
Depression T1	2.35	(0.60)**	1.04	(0.27)*	-	-	0.31	(0.16)*	0.89	(0.36)*	0.28	(0.12)*	0.18	(0.09)*
Group (Ba vs. Co)	-1.57	(5.76)	-2.26	(2.58)	1.29	(1.63)	1.35	(1.47)	-0.90	(3.41)	1.75	(1.15)	0.47	(0.89)
Time × Group	-7.16	(2.68)**	-3.48	(1.28)**	0.12	(0.62)	-1.04	(0.59)†	-3.92	(1.54)*	-0.61	(0.58)	-0.96	(0.45)*
Model 2														
Within														
Constant	65.11	(3.98)**	41.00	(1.81)**	9.87	(1.15)**	13.00	(1.05)**	46.92	(2.39)	10.42	(0.80)**	9.95	(0.69)**
Time (T1 vs. T3)	-1.67	(1.90)	-0.97	(1.03)**	1.15	(0.36)**	-0.48	(0.46)	-1.96	(0.93)*	-0.29	(0.39)	-0.25	(0.38)
Between														
Brooding T1	1.38	(0.78)	0.49	(0.34)	0.56	(0.22)*	0.61	(0.21)**	0.87	(0.48)	-	-	0.19	(0.09)*
Depression T1	2.34	(0.57)	1.07	(0.25)**	-	-	0.36	(0.15)*	0.77	(0.36)*	0.26	(0.11)	0.22	(0.13)
Group (Ba vs. Co)	0.08	(5.49)	-1.11	(2.48)	1.88	(1.57)	-1.29	(1.45)	-0.04	(3.31)	2.41	(1.08)*	0.67	(0.95)
Time × Group	-7.16	(2.60)**	-3.40	(1.40)*	0.12	(0.50)	-1.04	(0.63)†	-3.80	(1.28)**	-0.57	(0.54)	-0.95	(0.52)†

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up measurement. Ba = behavioral activation. Co = waiting list control group. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

Table 4

Multilevel Regression Intention-to-Treat Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and 3-Month Follow-Up (Model 2) Exposure Versus Behavioral Activation Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	70.48	(3.52)**	41.96	(1.49)**	12.28	(0.74)**	12.85	(0.79)**	49.16	(2.17)**	13.11	(0.61)	10.89	(0.51)**
Time (T1 vs. T2)	-9.12	(2.23)**	-4.45	(0.94)**	-1.04	(0.46)*	-1.53	(0.40)**	-5.89	(1.39)**	-0.87	(0.37)*	-1.19	(0.33)**
Between														
Brooding T1	-0.56	(0.85)	0.27	(0.36)	0.10	(0.18)	0.27	(0.20)	0.20	(0.53)	-	-	0.37	(0.12)**
Group (Ex vs. Ba)	-8.85	(5.17)†	-4.32	(2.19)*	-1.05	(1.09)	-1.60	(1.15)	-2.81	(3.20)	-1.83	(0.86)*	0.52	(0.75)
Time × Group	-3.06	(4.53)	-0.67	(1.92)	-2.13	(0.94)*	-0.25	(0.80)	-3.12	(2.81)	0.77	(0.76)	0.08	(0.70)
Model 2														
Within														
Constant	71.14	(3.54)**	41.93	(1.49)**	12.38	(0.76)**	12.78	(0.77)**	48.99	(2.04)**	13.24	(0.57)**	10.83	(0.51)**
Time (T1 vs. T3)	-9.17	(2.13)**	-4.33	(0.98)**	-1.01	(0.47)*	-1.52	(0.44)**	-5.87	(1.19)**	-0.88	(0.39)*	-1.18	(0.34)**
Between														
Brooding T1	0.38	(0.84)	0.30	(0.35)	0.15	(0.18)	0.33	(0.19)†	0.30	(0.50)	-	-	0.40	(0.12)**
Group (Ex vs. Ba)	-9.22	(5.08)†	-4.31	(2.14)*	-1.13	(1.09)	-1.52	(1.10)	-2.59	(2.93)	-1.96	(0.80)*	0.55	(0.74)
Time × Group	1.17	(3.21)	1.21	(1.36)	-0.88	(0.65)	0.12	(0.60)	-1.02	(1.66)	0.55	(0.54)	-0.38	(0.47)

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up. Ex = exposure therapy. Ba = behavioral activation. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

(p = .02, d = 0.8) and grief rumination levels (p = .003, d = 0.9). No significant interaction effects were found for symptom levels of depression (p = .40, d = -0.2) and anxiety (p = .10, d = 0.5), and depressive reflection (p = .07, d = 0.6) and depressive brooding (p = .29, d = 0.3).

Exposure Versus Behavioral Activation at Posttest and Follow-up
Only one difference between exposure and behavioral activation was detected: at posttest, exposure had resulted in stronger reductions in depressive symptoms than behavioral activation (p = .02, d = 0.6). Other differences on dependent variables at posttest and follow-up were negligible to small (d's = 0.05-0.42), and failed to reach statistical significance.

COMPLETER ANALYSES
Table 5, Table 6, and Table 7 show the completer's multilevel regression analyses. That is, analyses performed on the data from all participants who were initially allocated to one of our three groups, excluding treatment dropouts. The completer means and standard deviations and corresponding within- and between-group effect sizes are available as an online supplement.

Treatment Effects for Exposure at Posttest and Follow-up
At postmeasurement, significant interaction effects (Time × Group) were found for exposure on levels complicated grief (p = .007, d = 0.8), posttraumatic stress (p < .001, d = 1.1), depression (p = .01, d = 0.7), and anxiety (p < .001, d = 0.7), grief rumination (p = .004, d = 1.4), and depressive brooding (p < .001, d = 1.1), but not reflection (p = .18, d = 0.5).

At follow-up, effects of exposure were maintained for complicated grief (p = .03, d = 0.7), grief rumination (p < .001, d = 1.4), and depressive brooding (p = .04, d = 0.8). Additionally, an interaction effect was found on depressive reflection (p = .02, d = 0.9). However, despite moderate effect sizes, no interaction effects were found for three other variables that were significantly reduced at posttreatment: symptoms of posttraumatic stress (p = .07, d = 0.7), depression (p = .13, d = 0.4), and anxiety (p = .10, d = 0.5).

Treatment Effects for Behavioral Activation at Posttest and Follow-up
Whereas the completer analyses of exposure therapy corresponded with the findings of the intention-to-treat analyses, results were less consistent for behavioral activation. At postmeasurement, significant interaction effects were found on posttraumatic stress (p = .02, d = 0.9), anxiety (p = .03, d = 0.4), depressive brooding (p = .02, d = 0.8), and depres-

sive reflection (p = .03, d = 0.8). No significant interaction effects were detected for complicated grief (p = .07, d = 0.4), grief rumination (p = .08, d = 0.5), and depression (p = .21, d = 0.2).

At follow-up, the effects of behavioral activation were maintained for posttraumatic stress symptoms (p = .03, d = 1.1) and behavioral activation also significantly reduced grief rumination (p = .004, d = 1.0). However, despite moderate to large effect sizes, no significant interaction effects emerged at 3-month follow-up for complicated grief (p = .06, d = 0.6), anxiety (p = .16, d = 0.4), depressive brooding, (p = .20, d = 0.5), and depressive reflection (p = .07, d = 0.9). No effect was found for depression (p = .95, d = 0.0).

Exposure Versus Behavioral Activation at Posttest and Follow-up
No significant Time × Group interaction effects were detected when comparing exposure and behavioral activation at posttest and 3-month follow-up. Nevertheless, moderate to large interaction effects in favor of exposure were observed for complicated grief (p = .27, d = 0.7), depression (p = .13, d = 0.8), anxiety (p = .16, d = 0.5), and grief rumination (p = .16 , d = 0.9) at posttest. At follow-up, behavioral activation appeared more effective in reducing posttraumatic stress (p = .53, d = 0.6), and exposure in reducing depression (p = .17, d = 0.6). All other effects were small (d's = 0.17–0.43).

CLINICAL CHANGE
As a measure of clinical change, we calculated a Reliable Change Index (RCI) by calculating what percentage of each group experienced a reduction in symptom scores larger than two times the baseline SE of measurement of a dependent variable (Jacobson & Truax, 1991). For these analyses we used the observed values for all participants for our main outcome measures: complicated grief and grief rumination.

At posttest, 46.7% of participants in the exposure group, 45.5% of participants in the behavioral activation group, and 10.0% of people in the control group had achieved reliable change on complicated grief symptoms. At 3-month follow-up, 58.3% of participants in the exposure group, 63.6% of participants in the behavioral activation group, and 20.0% of people in the control group attained reliable change on complicated grief levels. Chi-square tests showed no significant differences in percentages of participants that attained reliable change between the exposure and control group at posttest, $\chi^2(1)$ = 3.71, p = .054, and follow-up, $\chi^2(2)$ = 3.32, p = .07, and between behavioral activation and the control group at posttest, $\chi^2(1)$ = 3.23, p = .07, and follow-up, $\chi^2(1)$ = 1.53, p = .22, or between the behavioral

Table 5

Multilevel Regression Completers Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and 3-Month Follow-Up (Model 2) Exposure Versus Control Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	58.30	(5.92)**	38.40	(2.51)**	8.10	(1.46)**	10.90	(1.27)**	43.60	(2.84)**	9.50	(0.93)**	8.90	(0.88)**
Time (T1 vs. T2)	1.60 (4.81)	(4.81)	1.60	(1.87)	0.30	(1.11)	0.30	(0.73)	0.50	(3.04)	1.50	(0.68)*	0.10	(0.83)
Between														
Group (Ex vs. Co)	3.70	(8.02)	0.35	(3.44)	2.31	(1.97)	0.60	(1.72)	3.82	(3.84)	2.50	(1.25)	2.43	(1.19)*
Time × Group	-17.52	(6.51)**	-8.60	(2.53)**	-3.80	(1.51)*	-3.30	(0.98)**	-12.00	(4.12)**	-3.42	(0.92)**	-1.52	(1.13)
Model 2														
Within														
Constant	58.30	(6.00)**	38.40	(2.55)**	8.10	(1.43)**	10.90	(1.43)**	43.60	(2.54)**	9.50	(0.85)**	8.90	(0.85)**
Time (T1 vs. T3)	-2.40	(2.36)	-1.50	(1.08)	-1.10	(0.46)*	-0.55	(0.52)	-2.10	(1.17)†	-0.25	(0.43)	-0.25	(0.42)
Between														
Group (Ex vs. Co)	4.80	(8.49)	0.50	(3.60)	2.70	(2.02)	0.40	(2.02)	4.10	(3.59)	2.30	(1.19)†	2.30	(1.20)†
Time × Group	-7.35	(3.34)*	-2.75	(1.52)†	-1.00	(0.65)	-1.20	(0.74)	-5.75	(1.64)**	-1.25	(0.61)*	-1.35	(0.60)*

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up. Ex = exposure therapy. Co = waiting list control group. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

Table 6

Multilevel Regression Completers Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and Follow-Up (Model 2) Behavioral Activation Versus Control Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	65.96	(4.35)**	41.36	(1.94)**	8.79	(1.34)**	12.00	(1.06)**	47.05	(2.23)**	10.37	(0.14)**	9.45	(0.73)**
Time (T1 vs. T2)	1.60	(3.26)	1.60	(1.77)	0.30	(0.82)	0.30	(0.55)	0.500	(1.87)	1.50	(0.74)*	0.10	(0.63)
Between														
Brooding T1	1.26	(1.13)	0.87	(0.49)†	0.77	(0.33)*	0.29	(0.29)	0.40	(0.57)	-	-	0.16	(0.18)
Depression T1	2.98	(0.76)**	1.00	(0.33)**	-	-	0.39	(0.19)*	1.41	(0.38)	0.40	(0.14)**	0.19	(0.12)
Group (Ba vs. Co)	-7.50	(7.31)	-0.32	(3.25)	3.64	(2.16)†	0.56	(1.79)	0.00	(3.74)	1.96	(1.53)	1.47	(1.21)
Time × Group	-9.17	(5.07)†	-6.74	(2.77)*	-1.59	(1.27)	1.87	(0.86)*	-5.07	(2.91)†	-2.79	(1.15)*	-2.10	(0.98)*
Model 2														
Within														
Constant	66.73	(4.71)**	41.78	(1.97)	9.34	(1.32)**	12.46	(1.22)**	47.10	(2.50)**	10.24	(0.83)**	9.48	(0.77)**
Time (T1 vs. T3)	-2.40	(1.97)	-1.50	(1.11)	-1.10	(0.30)**	-0.55	(0.49)	-2.10	(0.94)*	-0.25	(0.41)	-0.25	(0.42)
Between														
Brooding T1	1.42	(1.16)	0.60	(0.44)	0.75	(0.31)*	0.27	(0.30)	0.84	(0.63)	-	-	0.17	(0.17)
Depression T1	2.76	(0.78)**	1.09	(0.30)**	-	-	0.50	(0.20)*	0.95	(0.42)*	0.34	(0.12)**	0.14	(0.12)
Group (Ba vs. Co)	-9.36	(8.11)	-1.33	(3.34)	2.28	(2.27)	-0.55	(2.10)	-0.10	(4.32)	2.28	(1.38)	1.40	(1.30)
Time × Group	-5.67	(3.07)†	-3.86	(1.73)*	0.03	(0.47)	-1.09	(0.77)	-4.19	(1.47)**	-0.82	(0.64)	-1.18	(0.65)†

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up measurement. Ba = behavioral activation. Co = waiting list control group. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

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Table 7

Multilevel Regression Completers Analyses: Time and Interaction Effects (Time x Group) at Post-Measurement (Model 1) and 3-Month Follow-Up (Model 2) Exposure Versus Behavioral Activation Group

	CG		PTSD		Depression		Anxiety		Grief rumination		Brooding		Reflection	
	b	(SE)	b	(SE)	B	(SE)	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Model 1														
Within														
Constant	62.34	(3.17)**	39.00	(1.82)**	10.55	(0.85)**	11.51	(0.86)**	47.22	(2.51)**	12.00	(0.68)**	11.51	(0.66)**
Time (T1 vs. T2)	-15.91	(4.62)**	-7.00	(2.09)**	-3.500	(0.89)**	-3.00	(0.62)**	-11.50	(2.98)**	-1.92	(0.77)*	-1.42	(0.81)†
Between														
Brooding T1	0.59	(1.09)	0.43	(0.52)	0.23	(0.26)	0.03	(0.28)	-0.34	(0.71)	-	-	0.30	(0.18)
Group (Ex vs. Ba)	6.51	(5.40)	5.85	(3.07)†	2.65	(1.44)†	2.60	(1.47)†	5.11	(4.22)	1.57	(1.12)	-0.09	(1.11)
Time × Group	8.35	(7.61)	1.86	(3.44)	2.21	(1.47)	1.43	(1.02)	6.93	(4.90)	0.63	(1.27)	-0.58	(1.33)
Model 2														
Within														
Constant	70.27	(5.78)**	45.14	(2.31)**	13.36	(1.08)**	14.23	(1.18)**	-6.29	(1.59)**	13.57	(0.80)**	11.44	(0.86)**
Time (T1 vs. T3)	-8.07	(3.28)*	-5.35	(1.38)**	-1.07	(0.58)†	-1.64	(0.60)**	-4.76	(4.08)	-1.07	(0.54)*	-1.43	(0.50)**
Between														
Brooding T1	-0.81	(1.40)	0.14	(0.55)	0.07	(0.27)	-0.08	(0.30)	-0.26	(0.77)	-	-	0.26	(0.21)
Group (Ex vs. Ba)	-7.76	(7.71)	-6.13	(3.08)*	-2.51	(1.44)†	-3.00	(1.57)†	-4.76	(4.08)	-1.77	(1.04)	-0.05	(1.15)
Time × Group	-1.68	(4.28)	1.11	(1.79)	-1.03	(0.76)	-0.11	(0.78)	-1.56	(2.07)	-0.43	(0.70)	-0.17	(0.65)

Note. CG = complicated grief. PTSD = posttraumatic stress disorder. T1 = baseline measurement. T2 = post-measurement. T3 = three month follow-up. Ex = exposure therapy. Ba = behavioral activation. ** = $p < .01$, * = $p < .05$, † = $p < .10$.

activation and exposure group at either measurement moment (p's > .10).

At posttest, 46.7% of the exposure group, 36.4% of the behavioral activation group, and 10.0% of the control group had achieved reliable change on grief rumination levels. At follow-up, 66.7% of the exposure group, 45.4% of the behavioral activation group, and 30.0% of the control group had attained reliable change on grief rumination. Chi-square tests showed no differences in percentages of participants who achieved reliable change between the exposure and control group at posttest, $\chi^2(1) = 3.71$, $p = .054$, and follow-up, $\chi^2(1) = 2.93$, $p = .09$, nor between behavioral activation and the control group and the behavioral activation and exposure group at either measurement moment (p's > .10).

Discussion

In the current study, we set out to examine the effectiveness and feasibility of two different modules of brief therapist-guided online CBT for people experiencing elevated levels of complicated grief and grief rumination: exposure and behavioral activation. Our intention-to-treat analyses showed that, compared to a waiting list control group, each intervention resulted in large effects on the two core variables of interest, complicated grief and grief rumination, at postmeasurement, and that these effects were maintained at 3-month follow-up. Additionally, it was shown that exposure yielded moderate to large effects on symptom levels of depression, posttraumatic stress and brooding at posttreatment, and a large effect on reflection at follow-up. Behavioral activation additionally showed large effects on posttraumatic stress at posttest and follow-up measurement, and on reflection at posttest. Comparison of therapy groups showed only one significant effect: exposure yielded larger reductions in depressive symptoms than behavioral activation at posttest.

Completer analyses confirmed the effectiveness of exposure therapy, giving similar results as the intention-to-treat analyses, with one exception: exposure therapy additionally reduced brooding at posttreatment. By contrast, the completer analyses for the behavioral activation group yielded different results from the intention-to-treat analyses. Significant effects were no longer detected for complicated grief. Grief rumination levels were now only significantly reduced at follow-up. However, behavioral activation did show moderate to large reductions of anxiety and depressive rumination at posttest.

It should be acknowledged that, due to power limitations, large effects were sometimes not detected, but could nevertheless signify important clinical differences. Most notably, exposure resulted in much stronger effects than behavioral activation on levels of complicated grief, depression, and grief rumination at posttest in treatment completers.

Taken together, the results support the potential of exposure therapy as an online treatment module for people who experience high levels of loss-related distress and rumination. Intention-to-treat and completer analyses support its effectiveness in reducing levels of psychopathology and rumination in the short-term and show that exposure maintains effects on core dependent variables (i.e., complicated grief and grief rumination) over a 3-month period. The potential of this form of treatment is further reflected in acceptable feasibility ratings and in a relatively low dropout rate. These findings correspond with trials which have shown large effects of face-to-face and guided Internet-based CBT for complicated grief using exposure therapy modules as part of a larger, integrated therapy (e.g., Boelen et al., 2007; Shear et al., 2005; Wagner et al., 2006).

A unique finding was that exposure therapy for bereaved persons reduced grief rumination and depressive brooding and reflection (cf. Wisco et al., 2013). As such, it adds to a body of research supporting the hypothesis that rumination after bereavement could serve as cognitive avoidance (RAH; Stroebe, Boelen, et al., 2007, e.g., Boelen et al., 2006; Eisma et al., 2013; Eisma, Schut, et al., 2014; Giorgio et al., 2010; Morina, 2011). That is, as exposure therapy increases confrontation with painful aspects of the loss, it reduces the need to engage in avoidance behavior (Boelen et al., 2011). The strong reductions in rumination following exposure therapy therefore suggest rumination acts as an avoidance process after loss.

The general pattern of findings for behavioral activation is promising, but more difficult to interpret. While consistent reductions in complicated grief, posttraumatic stress, and grief rumination levels at posttest and follow-up were found in intention-to-treat analyses, the completer analyses only partially supported this pattern of findings. Generally, results appear in line with a recent pilot investigation demonstrating large effects of behavioral activation for complicated grief, posttraumatic stress, and depression levels (Papa, Sewell, et al., 2013). However, the high dropout and inconsistent feasibility ratings for behavioral activation indicate that the current protocol is unsuitable for clinical application.

Notably, the inconsistencies in results of the intention-to-treat and completer analyses on behavioral activation can be attributed to two interrelated causes. First, with only seven treatment completers in the behavioral activation group, our power was too low to detect anything but large effects in the

completer analyses. Were we to find the same effects in a bigger sample, both analyses would likely have yielded similar results, as was the case for exposure. However, as effect sizes for dependent variables in the completer sample did not correspond consistently with the results from the intention-to-treat analyses, this explanation does not account for all observed differences. For example, the intention-to-treat analyses showed large effects on complicated grief, posttraumatic stress, and grief rumination levels at posttest and follow-up. Yet, in the completer sample, consistent and large effects were only detected on posttraumatic stress. The treatment results of non-completers included in the intention-to-treat analyses may therefore partly explain differences in results.

Despite the inconsistent support for the effectiveness and clinical applicability of online behavioral activation, a notable finding was that it reduced grief rumination relative to the control group across both time-points in the intention-to-treat analyses, and that depressive rumination was reduced at posttest in the completer analyses. These results add to a growing number of studies that preliminarily support the effectiveness of engaging in new meaningful activities in targeting rumination and worry (e.g., Chen, Liu, Rapee, & Pillay, 2013; Papa, Rummel, et al., 2013; Watkins et al., 2011). Potentially, behavioral activation may take up time, and challenge negative cognitions, thereby ameliorating rumination and loss-related distress (e.g., Boelen et al., 2006; Nolen-Hoeksema et al., 2008).

With regard to the comparison of exposure and behavioral activation, statistical testing offers no firm grounds for strong conclusions. However, looking at the effect sizes of results, these seem to rule in favor of exposure: exposure appears to have a lower dropout rate and higher feasibility and stronger short-term effects on complicated grief, depression, and grief rumination in people who completed treatment.

This investigation also permits some conclusions with regard to development and dissemination of online grief therapy. Specifically, Internet-based therapy may offer easily accessible help for mourners who experience strong loss-related distress, but who are unable to travel or live in remote areas. Whether online grief therapy is also more cost and time-efficient, this is still open for debate. Although therapists indicated that they often spent less than the maximum of 1 hour a week per participant on sending assignments and giving feedback, we did not collect data on their work hours, and cannot empirically support the idea that online therapy is more efficient than face-to-face therapy.

This study had a number of limitations. The most important limitation was that our investigation suffered from power problems. While the multilevel regression analyses conducted in the intention-to-treat procedure partly solved this problem, it is imperative to investigate online exposure and behavioral activation in larger samples. The benefits of such research could be threefold. First, it would allow for an adequately powered statistical comparison of the relative effectiveness of exposure and behavioral activation on primary and secondary outcome measures. Second, it could lead to stronger conclusions about the effectiveness of guided online CBT for bereaved individuals. Third, the moderating potential of demographic and loss-related characteristics on treatment effectiveness could be examined in order to clarify which persons benefit most from each treatment type.

Another limitation is that conjugally bereaved women were overrepresented in the present sample. This is common in bereavement research, and likely reflects both a relative overrepresentation of women in widowhood and a stronger need of women to share their feelings about a loss (Stroebe, Stroebe, & Schut, 2001). Notably, it is as yet unclear if gender moderates the effectiveness of grief treatment. Some research showed gender differences in the effectiveness of grief therapy. For instance, Schut, Stroebe, van den Bout, and de Keijser (1997) found that women responded more strongly to problem-focused grief treatment (e.g., gradual exposure and rational-emotive exercises), whereas men had more treatment gains in emotion-focused therapy (e.g., acceptance-based and client-centered exercises). However, a meta-analysis of grief therapy trials did not show effects of gender on grief treatment effects (Currier, Neimeyer, & Berman, 2008). A related limitation is that a majority of participants were highly educated. Better-educated persons may benefit more from (Internet-delivered) treatment. A replication study in a lower-educated sample is therefore recommended.

Lastly, the participants in our sample showed elevated levels of complicated grief and grief rumination, but were not formally diagnosed with a complicated grief disorder. Since levels of loss-related distress are positively related to grief therapy outcome (for a review, see Currier et al., 2008), this could imply that our interventions could have yielded larger effects in a clinically bereaved sample. This is an important topic for future investigation.

Despite these limitations, the current investigation made a unique contribution to understanding the effectiveness and feasibility of guided Internet-delivered CBT for subclinical complicated grief and grief rumination. Simultaneously, it is one of the first studies to support the potential applicability of brief treatment for distressed bereaved individuals. It has provided preliminary evidence for the effectiveness and clinical applicability of brief Internet-based

exposure. However, despite some promising findings, it did not consistently support feasibility of brief online behavioral activation. More generally, results corroborate the view that exposure is an effective treatment for people experiencing severe loss-related distress, and that potential beneficial effects of behavioral activation need to be investigated further.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.beth.2015.05.007.

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