Received: 13 October 2023 | Revised: 19 December 2023 | Accepted: 20 December 2023

DOI: 10.1002/cpp.2950

RESEARCH ARTICLE

WILEY

The associations of grief-related rumination with prolonged grief and posttraumatic stress symptoms: A longitudinal study of bereaved after the 2011 terror attack in Norway

Jens C. Thimm[1,2] | Pål Kristensen[2] | Ingebjørg Fossberg Aulie[3] | Ida Marie Larsen[4] | Iren Johnsen[2]

[1]Department of Psychology, UiT The Arctic University of Norway, Tromsø, Norway

[2]Centre for Crisis Psychology, University of Bergen, Bergen, Norway

[3]Lillestrøm Municipality, Lillestrøm, Norway

[4]DPS Fredrikstad, Østfold Hospital Trust, Fredrikstad, Norway

Correspondence
Jens C. Thimm, Department of Psychology, UiT The Arctic University of Norway, Tromsø 9037, Norway.
Email: jens.thimm@uit.no

Abstract

After the sudden and violent death of a loved one, many bereaved experience symptoms of prolonged grief (PG) and posttraumatic stress (PTS). The present study investigated the cross-sectional and longitudinal associations of grief-related rumination with PG and PTS symptoms among bereaved parents and siblings after the Utøya terror attack in Norway on 22 July 2011 ($N = 110$, $M_{age} = 43.2$ years, 59.1% female). Participants' responses on the Rumination Scale, the Inventory of Complicated Grief and the Impact of Event Scale-Revised 28, 40 and 102 months after the loss were analysed. Cross-sectionally and longitudinally, grief-related rumination was positively and strongly linked with PG and PTS symptoms. When controlling for the baseline levels of PG and PTS symptoms and demographics of the sample, grief-related rumination predicted PG symptoms after 12 months but not after 74 months. Further, grief-related rumination predicted significantly the PTS symptoms of avoidance after 12 and 74 months and hyperarousal after 74 months beyond sample demographics and baseline symptoms. The results suggest that grief-related rumination is an important factor in PG and PTS symptoms after traumatic bereavement.

KEYWORDS

bereavement, grief-related rumination, posttraumatic stress, prolonged grief, Utøya terror attack, violent death

1 | INTRODUCTION

Experiencing symptoms of prolonged grief (PG) and posttraumatic stress (PTS) is common after traumatic bereavement. Traumatic bereavement is defined by a sudden and violent death of a loved one (Barlé et al., 2017), such as the loss of a loved one to suicide, in an accident or in a terror attack. Characteristics of the bereaved that have shown associations with the level of PG after a violent loss include female gender, mental health problems (e.g., depression and anxiety), attachment anxiety and rumination (Heeke et al., 2017). However, longitudinal studies are lacking (Heeke et al., 2017). The present study examined the role of grief-related rumination for PG and PTS symptoms after 12 and 74 months among bereaved after the 2011 Utøya attack in Norway, in which 69 people at the annual summer camp of the Labor Party's youth organization were killed by a right-wing extremist.

PG is a maladaptive form of grief that is characterized by an intensity and duration that exceeds normal grief reactions

(Shear, 2015). Core symptoms of PG include intensive longing for the deceased, preoccupying thoughts of the deceased and difficulties accepting the loss and moving forward in life (Killikelly & Maercker, 2017; Prigerson et al., 2021). PG is recognized as a psychiatric diagnosis in the International Classification of Diseases (11th revision; World Health Organization, 2019/2021) and the Diagnostic and Statistical Manual of Mental Disorders (5th ed., text rev.; American Psychiatric Association, 2022). A recent meta-analysis suggests a much higher risk of developing PG symptoms after an unnatural loss (40–50%; Djelantik et al., 2020) as compared to a natural loss (10%; Lundorff et al., 2017). Moreover, due to the traumatic circumstances of the loss, PTS symptoms can be experienced after traumatic bereavement, such as intrusive memories, thoughts and images, hyperarousal (e.g., irritability and sleep problems) and avoidance of reminders of the loss (Barlé et al., 2017). The PTS symptom clusters of intrusions, hyperarousal and avoidance are highly correlated. At the same time, they have been shown to be differently related to other forms of psychopathology (Levin-Aspenson et al., 2021) and structural brain alterations after trauma exposure (Crombie et al., 2021), suggesting that the three PTS symptom clusters should be examined separately.

As a possible cognitive risk factor for developing and maintaining PG and PTS symptoms, rumination has gained increased research attention in recent years (e.g., Andrews et al., 2021; Eisma & Stroebe, 2017; Heeke et al., 2017; Morina, 2011; Moulds et al., 2020; Watkins & Moulds, 2013). Rumination is considered a form of repetitive negative thinking, which can be described as repetitive and relatively uncontrollable thoughts with negative content (Ehring & Watkins, 2008). Rumination has been extensively researched in connection with depression (Nolen-Hoeksema et al., 2008). Nolen-Hoeksema (1991) defined rumination as repetitive thoughts about the causes and consequences of depressive symptoms, without engaging in active problem solving to alleviate them. In addition to depression, rumination has been shown to be related to a wide range of mental problems, including PG and PTS (Aldao et al., 2010; Eisma & Stroebe, 2017; Moulds et al., 2020; Szabo et al., 2017). As such, rumination can be considered a transdiagnostic phenomenon (Ehring, 2021). To understand the detrimental effects of rumination, the Response Styles Theory (Nolen-Hoeksema, 1991) is often used (e.g., Moulds et al., 2020). In brief, the Response Style Theory views rumination as a recurring self-confrontation with a theme that prevents the individual from active problem solving (Nolen-Hoeksema, 2004). With respect to PTS, Ehlers and Clark (2000) proposed that rumination strengthens maladaptive beliefs about the traumatic event and interferes with developing a coherent and detailed trauma narrative. Similar to Ehlers and Clark (2000), Boelen et al. (2006) and Stroebe et al. (2007) suggested that rumination after bereavement is a form of cognitive avoidance of the reality of the loss of the loved one. In support of the Rumination as Avoidance Hypothesis, Eisma et al. (2013) found that rumination is associated with cognitive, behavioural and emotional avoidance after bereavement. However, it has been pointed out that rumination in some circumstances can be adaptive, especially when it is focused on concrete and specific experiences versus being abstract and analytical (Watkins, 2008).

Key Practitioner Message

- Grief-related rumination is strongly associated with symptoms of prolonged grief and posttraumatic stress disorder after traumatic bereavement.
- Grief-related rumination predicts symptoms of prolonged grief and posttraumatic stress disorder after 12 and 74 months.
- Grief-related rumination should be targeted in psychological interventions after traumatic bereavement.

Grief-related rumination has been defined as a type of rumination that focuses specifically on the causes and consequences of a loss (Eisma, Stroebe, et al., 2014). Several studies have reported cross-sectional associations of grief-related rumination difficulties with meaning making after a loss (Michael & Snyder, 2005; Milman et al., 2019) and with PG symptoms (e.g., Eisma et al., 2020; Eisma, Stroebe, et al., 2014; Johnsen et al., 2021; Lenferink et al., 2017; Milman et al., 2019; Sveen et al., 2019; van der Houwen et al., 2010). In addition, it has been shown that grief-related rumination predicts symptoms of PG more strongly than depressive rumination (Eisma, Stroebe, et al., 2014). However, studies on the longitudinal relationships between grief-related rumination and PG symptoms are scarce. Boelen et al. (2011) reported that change in rumination predicted change in PG in the course of cognitive-behavioural therapy (CBT) for PG. Eisma, Schut, et al. (2015) found in a community bereaved sample that rumination about the unfairness of the death and about social interactions predicted positively PG symptoms after 6 and 12 months. On the other hand, rumination about emotional reactions to the loss was negatively associated with symptoms of PG after 6 and 12 months (Eisma, Schut, et al., 2015). Recently, Johnsen et al. (2021) reported that grief-related rumination predicted symptoms of PG 12 months later in bereaved close friends after the 2011 Utøya attack. In addition, Johnsen et al. (2021) found that grief-related rumination was associated with the PTS symptom of avoidance after 12 months.

The purpose of the present study was to build and expand on the Johnsen et al. (2021) study that investigated grief-related rumination in bereaved close friends after the 2011 Utøya terror attack. The current study focused on bereaved parents and siblings after the terrorist attack on Utøya and the role of grief-related rumination for PG and PTS symptoms in this group. Further, the study period was extended from 12 months in the Johnsen et al. (2021) study to 74 months in the present study. Given previous findings on the associations of grief-related rumination with PG and PTS symptoms (e.g., Eisma, Schut, et al., 2015; Johnsen et al., 2021), it was expected that grief-related rumination was cross-sectionally and longitudinally associated with symptoms of PG and PTS, especially avoidance.

2 | METHODS

2.1 | Participants

The present study is part of the longitudinal project 'Bereaved of the Utøya terror attack on July 22, 2011' (Utøya-study), which started in 2013. In the Utøya-study, bereaved parents, siblings, friends, partners and children of the deceased were assessed 18 (T1), 28 (T2), 40 (T3) and 102 months (T4) after the terror attack using questionnaires and qualitative interviews (e.g., Dyregrov et al., 2015; Fjærestad et al., 2022; Johnsen et al., 2021; Kristensen et al., 2020; Nordström et al., 2022). Bereaved biological parents and siblings were identified through the Norwegian Population Register ($N = 208$). and invited by mail to participate in all four waves of the study. The letter included information about the purpose of the study, the procedures and voluntary participation. In addition, seven stepparents and one stepsibling participated in the study. A measure of grief-related rumination was included in the survey at T2, T3 and T4. At T2, the response rate was 55.6% ($N = 120$), at T3 51.9% ($N = 112$) and at T4 56.5% ($N = 122$). All participants provided written informed consent. Only participants who had answered the measures of grief-related rumination, PG and PTS at T2, and PG and PTS at T3 or T4 were included in the present investigation. Out of the 120 participants at T2, 112 participated also at T3 or T4 (89 participated at both time points). The results of the dropout analysis are presented in the results sections. One participant was excluded due to missing responses on the measure of grief-related rumination at T2, and one participant did not answer the measure of PG symptoms at T3 or T4. Thus, the final sample comprised 110 participants, 65 (59.1%) of which were female. Seventy-seven (70.0%) of the participants were parents, and 33 (30.0%) were siblings of the deceased. The participants' average age was 43.2 years ($SD = 15.2$ years, range 13 to 79 years). The deceased were 23 men (47.9%) and 25 women (52.1%) with a mean age of 19.8 years ($SD = 7.7$ years). The Utøya-study was approved by the Regional Committee for Medical and Health Research Ethics (2018/2174).

2.2 | Measures

2.2.1 | Rumination Scale

The Rumination Scale (RS; van der Houwen et al., 2010) was used to measure grief-related rumination. The RS is a self-report scale comprising eight items that are scored on a scale from 1 (*almost never*) to 5 (*almost constantly*). The items of the RS assess thinking about how bad one feels since the death, the cause of the death, what one would like to have done differently in the relationship with the deceased, the consequences of keeping feeling sad, the circumstances of the death, how the death could have been prevented, who is responsible for the death and the way one reacts to the death. The Norwegian version of the RS has been used in the Johnsen et al. (2021) study. In the study sample, the scale had satisfactory reliability with Cronbach's alphas of .75, .84 and .87 at T2, T3 and T4, respectively.

2.2.2 | Inventory of Complicated Grief

The Inventory of Complicated Grief (ICG; Prigerson et al., 1995) was used to assess PG symptoms. The ICG is a self-report scale consisting of 19 items that are answered on a 5-point frequency scale ranging from 0 (*never*) to 4 (*always*). The threshold value for the distinction between normal grief and PG is set at 25 (Prigerson et al., 1995). The Norwegian translation of the ICG has shown adequate psychometric properties (Thimm et al., 2019). In the sample of the present study, the scale had a high reliability with Cronbach's alphas of .92 at all three measurement points.

2.2.3 | Impact of Event Scale-Revised

The Impact of Event Scale-Revised (IES-R; Weiss, 2007) was used to assess symptoms of PTS. In the IES-R, intrusions, avoidance and hyperarousal are measured with 22 self-report items that are answered on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). The Norwegian version of the IES-R has been validated (Eid et al., 2009). Cronbach's alpha of three subscales ranged from .84 (avoidance at T2 and T3) to .92 (intrusions at T3) in the present sample.

2.3 | Statistical analyses

Few responses on the questionnaires were missing (RS: 0.3%, ICG: 0.5%, IES: 0.5%), and missing data were replaced by scale mean imputation. Differences between participants who dropped out at T3 or T4 and completers on demographic variables (age, gender and kinship) and on the study measures were examined using *t* tests (continuous variables) and χ^2 tests (dichotomous variables). When an expected cell count was less than 5, Fisher's exact test was applied. Bivariate associations of the RS with the ICG and the IES-R were analysed with Pearson correlations. Four hierarchical multilevel regression analyses were performed to examine whether RS scores at T2 predict ICG, IES-R-intrusion, IES-R- avoidance and IES-R-arousal scores at T3 and T4. In the first step, the respective symptom scale scores at T2, gender, age and relationship to the deceased were entered. In Step 2, the RS scores at T2 were added to the models. Multilevel modelling was applied because there were clusters of participants who were bereaved by the loss of the same person; that is, the participant data were clustered within families. The intra-class correlation coefficients ranged from .00 (ICG at T4) to .19 (ICG at T3). The analyses were conducted in R (Version 4.2.3; R Core Team, 2023) using the packages misty (Version 0.4.8; Yanagida, 2023), lme4 (Version 1.1-33; Bates et al., 2015) and r2mlm (Version 0.3.3; Shaw et al., 2023).

3 | RESULTS

The means and standard deviations of the RS, ICG and IES-R scales at T2, T3 and T4 of the final sample ($N = 110$) are shown in Table 1. The

TABLE 1 Means (M), standard deviations (SD) of the study measures and correlations of the RS with the ICG and IES-R scales at T2, T3 and T4

Time	Scale	*N*	*M*	*SD*	T2 RS	T3 RS	T4 RS
T2	RS	110	24.73	5.12	-		
T3	RS	104	23.95	5.93	.78***	-	
T4	RS	93	13.47	6.35	.60***	.68***	-
T2	ICG	110	34.07	14.58	.68***	.65***	.50***
T3	ICG	105	32.51	14.68	.69***	.77***	.59***
T4	ICG	93	30.87	13.32	.56***	.65***	.80***
T2	IES-R-intrusion	110	14.56	6.80	.67***	.65***	.46***
T3	IES-R-intrusion	105	13.78	6.81	.59***	.67***	.47***
T4	IES-R-intrusion	93	11.29	7.51	.51***	.62***	.72***
T2	IES-R-avoidance	110	12.76	6.42	.41***	.47***	.30***
T3	IES-R-avoidance	105	12.49	6.62	.49***	.60***	.43***
T4	IES-R-avoidance	93	9.83	6.61	.49***	.54***	.63***
T2	IES-R-arousal	110	10.17	5.71	.54***	.56***	.35***
T3	IES-R-arousal	105	9.62	6.09	.54***	.60***	.41***
T4	IES-R-arousal	93	8.38	5.98	.49***	.56***	.65***

Abbreviations: ICG, Inventory of Complicated Grief; IES, Impact of Event Scale; RS, Rumination Scale.
***$p < .001$.

dropout analysis showed that participants who dropped out at T3 ($N = 13$) did not differ significantly from completers in terms of age ($M = 40.5$ years, $SD = 14.5$ years vs. $M = 43.1$ years, $SD = 15.3$ years; $t[118] = -0.60$, $p = .552$, $d = -0.18$), gender (female: $N = 7$ [9.9%] vs. male: $N = 6$ [12.2%], $\chi^2 = 0.17$, $p = .679$), kindship (parents: $N = 8$ [9.6%] vs. siblings: $N = 5$ [13.5%]; $p = .536$) and scores on the RS ($M = 23.62$, $SD = 4.43$ vs. $M = 24.86$, $SD = 5.14$; $t[118] = -0.84$, $p = .404$, $d = -0.25$), ICG ($M = 32.75$, $SD = 11.01$ vs. $M = 34.16$, $SD = 14.69$; $t[118] = -0.33$, $p = .739$, $d = -0.10$), IES-R intrusion ($M = 12.92$, $SD = 5.69$ vs. $M = 14.77$, $SD = 6.95$; $t[118] = -0.92$, $p = .360$, $d = -0.27$), IES-R avoidance ($M = 11.18$, $SD = 3.53$ vs. $M = 13.00$, $SD = 6.74$; $t[118] = -1.55$, $p = .133$, $d = -0.28$) and IES-R arousal ($M = 9.77$, $SD = 4.11$ vs. $M = 10.40$, $SD = 5.82$; $t[118] = -0.38$, $p = .705$, $d = -0.11$) at T2. Similarly, at T4, there were no statistically significant differences between dropouts ($N = 26$) and completers with respect to gender (female: $N = 16$ [22.5%] vs. male: $N = 10$ [20.4%]; $\chi^2(1) = 0.08$, $p = .781$) and scores on the RS ($M = 24.48$, $SD = 4.29$ vs. $M = 24.80$, $SD = 5.28$; $t[118] = -0.28$, $p = .779$, $d = -0.06$), ICG ($M = 33.05$, $SD = 14.53$ vs. $M = 34.27$, $SD = 14.31$; $t[118] = -0.38$, $p = .701$, $d = -0.09$), IES-R intrusion ($M = 14.00$, $SD = 6.62$ vs. $M = 14.72$, $SD = 6.91$; $t[118] = -0.48$, $p = .634$, $d = -0.11$), IES-R avoidance ($M = 12.70$, $SD = 5.85$ vs. $M = 12.83$, $SD = 6.69$; $t[118] = -0.09$, $p = .929$, $d = -0.02$) and IES-R arousal ($M = 11.08$, $SD = 5.95$ vs. $M = 10.13$, $SD = 5.58$; $t[118] = 0.76$, $p = .449$, $d = 0.17$) at T2. However, significantly more siblings ($N = 15$, 40.5%) than parents ($N = 11$, 13.3%) dropped out at T4 ($\chi^2(1) = 11.23$, $p < .001$). Accordingly, dropouts at T4 were significantly younger at T2 than completers ($M = 33.8$ years, $SD = 17.4$ years vs. $M = 45.3$ years, $SD = 13.6$ years; $t[118] = -3.12$, $p = .004$, $d = -0.79$).

The bivariate correlations of the RS with the ICG and the IES-R scales at the different measurement points are also displayed in Table 1. The results showed that the RS was significantly correlated with the ICG and IES-R scales concurrently and longitudinally. Cross-sectional correlation coefficients between the RS and the ICG ranged from .68 at T2 to .80 at T4 and between the RS and the IES-R subscales between .41 (with IES-R-avoidance at T2) to .72 (with IES-R intrusion at T4). Longitudinally, the correlations of the RS with the ICG ranged from .56 (RS at T2 with ICG at T4) to .69 (RS at T2 with ICG at T3). For the IES-R subscales, the correlations ranged from .49 (RS at T2 with IES-R avoidance at T3 and T4 and with IES-R arousal at T4) to .62 (RS at T3 with IES-R intrusion at T4) (all *p*s < .001).

The results of the regression analyses predicting ICG and IES-R scale scores at T3 and T4 from RS scores at T2 are shown in Tables 2 and 3, respectively. In all analyses, ICG and IES-R subscale scores at T2 were a statistically significant predictor of the respective symptoms at T3 and T4 but not gender, age and the relationship to the deceased in the first step of the four models. When entered in Step 2, RS scores at T2 predicted significantly and uniquely ICG scores at T3 ($p = .004$, $\Delta R^2 = .02$) but not at T4 ($p = .069$, $\Delta R^2 = .02$) (Table 2). With regard to the IES-R scales, the RS at T2 predicted significantly IES-R avoidance at T3 ($p = .003$, $\Delta R^2 = .03$) and T4 ($p < .001$, $\Delta R^2 = .07$) and IES-R hyperarousal at T4 ($p = .016$, $\Delta R^2 = .04$) beyond demographics and baseline scores at T2. On the other hand, the RS at T2 did not predict significantly IES-R hyperarousal at T3 ($p = .182$, $\Delta R^2 = .00$) and IES-intrusion at T3 ($p = .085$, $\Delta R^2 = .01$) and T4 ($p = .221$, $\Delta R^2 = .01$) above the control variables entered in Step 1 (Table 3).

4 | DISCUSSION

The purpose of this study was to investigate the concurrent and longitudinal associations of grief-related rumination with PG and PTS

TABLE 2 Regression analysis predicting ICG scores at T3 and T4 from RS scores at T2

		T3 ICG							T4 ICG				
		b	*SE*	*β*	*p*	R^2			*b*	*SE*	*β*	*p*	R^2
Step 1	T2 ICG	0.80	0.06	0.81	<.001		Step 1	T2 ICG	0.62	0.08	0.67	<.001	
	Female gender	0.34	1.68	0.01	.842			Female gender	−0.27	2.30	−0.01	.906	
	Age	0.18	0.11	0.19	.125			Age	0.14	0.15	0.14	.375	
	Kinship	3.89	3.71	0.12	.297	.70		Kinship	4.28	4.84	0.14	.379	.45
Step 2	T2 ICG	0.67	0.07	0.67	<.001		Step 2	T2 ICG	0.50	0.10	0.54	<.001	
	Female gender	0.15	1.61	0.01	.925			Female gender	−0.28	2.26	−0.01	.901	
	Age	0.12	0.11	0.13	.271			Age	0.10	0.15	0.10	.527	
	Kinship	2.95	3.58	0.09	.412			Kinship	3.51	4.77	0.11	.465	
	T2 RS	0.61	0.21	0.21	.004	.72		T2 RS	0.49	0.26	0.19	.069	.47

Abbreviations: ICG, Inventory of Complicated Grief; RS, Rumination Scale.

TABLE 3 Regression analysis predicting IES subscale scores at T3 and T4 from RS scores at T2

		T3							T4				
		b	*SE*	*β*	*p*	R^2			*b*	*SE*	*β*	*p*	R^2
IES-R-intrusion													
Step 1	T2 IES-R-intrusion	0.75	0.07	0.76	<.001		Step 1	T2 IES-intrusion	0.79	0.09	0.72	<.001	
	Female gender	−1.43	0.92	−0.10	.122			Female gender	−1.57	1.23	−0.10	.204	
	Age	0.02	0.06	0.04	.761			Age	−0.14	0.09	−0.25	.120	
	Kinship	−0.45	1.97	−0.03	.822	.59		Kinship	−3.88	2.68	−0.22	.150	.47
Step 2	T2 IES-R-intrusion	0.66	0.08	0.67	<.001		Step 2	T2 IES-intrusion	0.70	0.11	0.63	<.001	
	Female gender	−1.63	0.91	−0.12	.077			Female gender	−1.71	1.23	−0.11	.166	
	Age	0.01	0.06	0.02	.897			Age	−0.13	0.09	−0.25	.119	
	Kinship	−0.57	1.95	−0.04	.770			Kinship	−3.76	2.66	−0.21	.161	
	T2 RS	0.20	0.11	0.15	.085	.60		T2 RS	0.18	0.14	0.12	.221	.48
IES-R-arousal													
Step 1	T2 IES-R-arousal	0.86	0.06	0.82	<.001		Step 1	T2 IES-arousal	0.66	0.09	0.61	<.001	
	Female gender	−0.37	0.72	−0.03	.608			Female gender	0.08	1.06	0.01	.939	
	Age	0.05	0.05	0.12	.329			Age	−0.01	0.07	−0.03	.851	
	Kinship	−0.24	1.58	−0.02	.878	.68		Kinship	−0.82	2.34	−0.06	.728	.38
Step 2	T2 IES-R-arousal	0.82	0.07	0.77	<.001		Step 2	T2 IES-arousal	0.53	0.11	0.49	<.001	
	Female gender	−0.51	0.73	−0.04	.482			Female gender	−0.22	1.04	−0.02	.833	
	Age	0.03	0.05	0.08	.530			Age	−0.05	0.07	−0.12	.480	
	Kinship	−0.48	1.57	−0.04	.762			Kinship	−1.36	2.23	−0.10	.544	
	T2 RS	0.11	0.08	0.09	.182	.68		T2 RS	0.27	0.11	0.24	.016	.42
IES-R-avoidance													
Step 1	T2 IES-R-avoidance	0.81	0.07	0.79	<.001		Step 1	T2 IES-avoidance	0.77	0.08	0.75	<.001	
	Female gender	−0.67	0.91	−0.05	.461			Female gender	−1.59	1.06	−0.12	.137	
	Age	0.01	0.06	0.03	.810			Age	−0.12	0.07	−0.25	.105	
	Kinship	−0.54	1.90	−0.04	.778	.61		Kinship	−3.58	2.30	−0.23	.123	.51
Step 2	T2 IES-R-avoidance	0.72	0.07	0.72	<.001		Step 2	T2 IES-avoidance	0.66	0.08	0.64	<.001	
	Female gender	−1.03	0.88	−0.08	.245			Female gender	−1.97	1.01	−0.15	.053	
	Age	−0.01	0.06	−0.03	.801			Age	−0.15	0.07	−0.32	.025	
	Kinship	−0.59	1.83	−0.04	.747			Kinship	−3.76	2.11	−0.24	.078	
	T2 RS	0.27	0.09	0.21	.003	.64		T2 RS	0.35	0.10	0.28	<.001	.58

Abbreviations: IES, Impact of Event Scale; RS, Rumination Scale.

symptoms after traumatic bereavement in bereaved parents and siblings after the 2011 Utøya terror attack. Symptoms of PG, PTS and grief-related rumination were assessed 28 (T2), 40 (T3) and 102 months (T4) after the attack. Grief-related rumination was positively and strongly linked with PG and PTS symptoms, concurrently and across the different measurement points. When controlling for the level of PG and PTS symptoms at T2 and demographics of the sample, grief-related rumination at T2 predicted PG symptoms after 12 months (T3) but not after 74 months (T4). Further, grief-related rumination at T2 predicted significantly the PTS symptoms of avoidance at T3 and T4 and hyperarousal at T4 beyond sample demographics and baseline symptoms.

The positive and strong correlations between grief-related rumination and PG found in the present study of bereaved after a terror attack are consistent with previous findings that showed positive and high association of rumination with PG symptoms in community bereaved samples (e.g., Tang et al., 2019) and in bereaved after a violent loss (Heeke et al., 2017). The finding that grief-related rumination predicts the level of PG symptoms 12 months later concurs with the results of the Eisma, Schut, et al. (2015) study and supports the idea that rumination plays a role in maintaining PG symptoms. To the best of our knowledge, the present study is the first to examine the longitudinal association between grief-related rumination and PG symptoms beyond 12 months. The results showed no statistically significant relationship over a 74-month period, suggesting that the predictive power of grief-related rumination is limited to shorter time periods. However, the relatively small sample size at T4 can have prevented the statistical detection of significant associations.

Consistent with the existing research literature on rumination and PTS (Moulds et al., 2020; Szabo et al., 2017), cross-sectional associations of grief-related rumination with PTS symptoms of intrusions, avoidance and hyperarousal were found in the present sample of traumatically bereaved. With regard to intrusions, Ehlers and Clark (2000) suggested that intrusive cognitions and images can lead to rumination but that rumination also can provide cues that again trigger intrusions. However, in the present study, grief-related rumination was not longitudinally associated with intrusions. In contrast, baseline grief-related rumination predicted later hyperarousal, which is consistent with research showing that rumination leads to increased physiological arousal (Pedersen et al., 2011). Moreover, grief-related rumination at T2 predicted avoidance of reminders of the loss after 12 and 74 months, supporting the Rumination as Avoidance Hypothesis. These results align with Ehlers and Clark's (2000) proposed relationship between rumination and avoidance as well previous empirical findings from experimental studies (Eisma, Schut, et al., 2014) and longitudinal investigations (Eisma et al., 2013) reporting close associations of grief-related rumination with avoidance in bereaved individuals. From a Rumination as Avoidance perspective, the repeated focus on loss-related emotions and thoughts in grief-related rumination represents a strategy to distract oneself from the overwhelming reality one is facing (Stroebe et al., 2007). Avoidance can be caused by the lack of acceptance (Stroebe et al., 2007), which can be particularly difficult for the bereaved due to the violent death (Parkes, 1998). This perspective is also shared by Boelen et al. (2006), who suggest that rumination after loss is characterized by a focus on one's own reactions and the meaning of the loss and acts as an escape from accepting the reality of the loss and emotions associated with it. Lack of acceptance can make it more challenging to integrate the loss with memories of oneself and the deceased in the autobiographical memory (Boelen, 2008). The bereaved may thus have difficulty understanding the loss and try to avoid reality, at the same time as they experience negative thoughts that reinforce negative emotions, where the negative emotions can prevent adjustment (Boelen, 2008).

The results of the present study in combination with previous research findings suggest that interventions aimed at grief-related rumination can possibly prevent PG and PTS symptoms from persisting and possibly worsening. Based on the Response Styles Theory (Nolen-Hoeksema, 1991) and the Rumination as Avoidance Hypothesis (Stroebe et al., 2007), behavioural activation, distraction (without suppression) and exposure therapy are relevant interventions. A randomized-controlled study comparing behavioural activation and exposure with a waitlist control condition found that both interventions were effective in reducing grief-related rumination and PG symptoms (Eisma, Boelen, et al., 2015). However, attrition was considerably higher among participants who received the behavioural activation intervention compared to the exposure group (Eisma, Boelen, et al., 2015). Exposure is an essential component of CBT for PG (Boelen, 2006; Shear et al., 2005; Wagner et al., 2005) and has shown to have a larger effect on PG symptoms than cognitive interventions alone (Bryant et al., 2014). Moreover, CBT for PG has been found to reduce rumination (Rosner et al., 2011). It can be hypothesized that the focus on specific events and emotions promotes constructive rumination.

A strength of the study is the long time interval over which the associations between grief-related rumination and PG and PTS symptoms were examined in this sample of bereaved after having lost a loved one in a terror attack. Moreover, a scale assessing grief-related rumination rather than depressive or general negative repetitive thinking was used. However, the generalizability of the findings to PG and PTS symptoms after other types of losses is unclear. Further, the scale used to assess grief-related rumination measures solely maladaptive rumination. Studies suggest, however, that rumination can be adaptive when it meets certain criteria (Watkins, 2008). For example, rumination about one's emotional reactions has shown to be negatively associated with subsequent PG symptoms (Eisma, Schut, et al., 2015). In addition, the RS has been little used in research and needs further validation. As an alternative measure of grief-related rumination, researchers and clinicians should consider using the well-validated Utrecht Grief Rumination Scale (Eisma, Stroebe, et al., 2014). Finally, the significantly higher dropout rate of bereaved siblings compared to bereaved parents at T4 limits the generalizability of the study findings at T4 to this group. On the other hand, the dropouts did not differ from the completers on the main variables of interest, that is, grief-related rumination and the levels of PG and PTS symptoms.

In conclusion, the results of the present study suggest that grief-related rumination and PG and PTS symptoms are concurrently

associated. Grief-related rumination predicted significantly PG symptoms after 12 months after controlling for baseline PG and demographics but not after 74 months. Further, grief-related rumination was longitudinally related to the PTS symptoms of hyperarousal and avoidance. Grief-related rumination seems to play an important role in maintaining symptoms of PG and PTS after the violent loss of a loved one.

ORCID

Jens C. Thimm https://orcid.org/0000-0002-0765-933X

REFERENCES

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.). https://doi.org/10.1176/appi.books.9780890425787

Andrews, P. W., Altman, M., Sevcikova, M., & Cacciatore, J. (2021). An evolutionary approach to grief-related rumination: Construction and validation of the Bereavement Analytical Rumination Questionnaire. *Evolution and Human Behavior*, *42*(5), 441–452. https://doi.org/10.1016/j.evolhumbehav.2021.03.007

Barlé, N., Wortman, C. B., & Latack, J. A. (2017). Traumatic bereavement: Basic research and clinical implications. *Journal of Psychotherapy Integration*, *27*, 127–139. https://doi.org/10.1037/int0000013

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Boelen, P. (2008). Cognitive behaviour therapy for complicated grief. *Bereavement Care*, *27*(2), 27–30. https://doi.org/10.1080/02682620808657717

Boelen, P. A. (2006). Cognitive-behavioral therapy for complicated grief: Theoretical underpinnings and case descriptions. *Journal of Loss and Trauma*, *11*(1), 1–30. https://doi.org/10.1080/15325020500193655

Boelen, P. A., de Keijser, J., van den Hout, M. A., & van den Bout, J. (2011). Factors associated with outcome of cognitive–behavioural therapy for complicated grief: A preliminary study. *Clinical Psychology & Psychotherapy*, *18*(4), 284–291. https://doi.org/10.1002/cpp.720

Boelen, P. A., van den Hout, M. A., & van den Bout, J. (2006). A cognitive-behavioral conceptualization of complicated grief. *Clinical Psychology: Science and Practice*, *13*(2), 109–128. https://doi.org/10.1111/j.1468-2850.2006.00013.x

Bryant, R. A., Kenny, L., Joscelyne, A., Rawson, N., Maccallum, F., Cahill, C., Hopwood, S., Aderka, I., & Nickerson, A. (2014). Treating prolonged grief disorder: A randomized clinical trial. *JAMA Psychiatry*, *71*(12), 1332–1339. https://doi.org/10.1001/jamapsychiatry.2014.1600

Crombie, K. M., Ross, M. C., Letkiewicz, A. M., Sartin-Tarm, A., & Cisler, J. M. (2021). Differential relationships of PTSD symptom clusters with cortical thickness and grey matter volumes among women with PTSD. *Scientific Reports*, *11*(1), 1825. https://doi.org/10.1038/s41598-020-80776-2

Djelantik, A. A. A. M., Smid, G. E., Mroz, A., Kleber, R. J., & Boelen, P. A. (2020). The prevalence of prolonged grief disorder in bereaved individuals following unnatural losses: Systematic review and meta regression analysis. *Journal of Affective Disorders*, *265*, 146–156. https://doi.org/10.1016/j.jad.2020.01.034

Dyregrov, K., Dyregrov, A., & Kristensen, P. (2015). Traumatic bereavement and terror: The psychosocial impact on parents and siblings 1.5 years after the July 2011 terror killings in Norway. *Journal of Loss and Trauma*, *20*(6), 556–576. https://doi.org/10.1080/15325024.2014.957603

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/s0005-7967(99)00123-0

Ehring, T. (2021). Thinking too much: Rumination and psychopathology. *World Psychiatry*, *20*(3), 441–442. https://doi.org/10.1002/wps.20910

Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, *1*(3), 192–205. https://doi.org/10.1521/ijct.2008.1.3.192

Eid, J., Larsson, G., Johnsen, B. H., Laberg, J. C., Bartone, P. T., & Carlstedt, B. (2009). Psychometric properties of the Norwegian Impact of Event Scale-Revised in a non-clinical sample. *Nordic Journal of Psychiatry*, *63*(5), 426–432. https://doi.org/10.1080/08039480903118190

Eisma, M. C., Boelen, P. A., van den Bout, J., Stroebe, W., Schut, H. A. W., Lancee, J., & Stroebe, M. S. (2015). Internet-based exposure and behavioral activation for complicated grief and rumination: A randomized controlled trial. *Behavior Therapy*, *46*(6), 729–748. https://doi.org/10.1016/j.beth.2015.05.007

Eisma, M. C., de Lang, T. A., & Boelen, P. A. (2020). How thinking hurts: Rumination, worry, and avoidance processes in adjustment to bereavement. *Clinical Psychology & Psychotherapy*, *27*(4), 548–558. https://doi.org/10.1002/cpp.2440

Eisma, M. C., Schut, H. A. W., Stroebe, M. S., Boelen, P. A., van den Bout, J., & Stroebe, W. (2015). Adaptive and maladaptive rumination after loss: A three-wave longitudinal study. *British Journal of Clinical Psychology*, *54*(2), 163–180. https://doi.org/10.1111/bjc.12067

Eisma, M. C., Schut, H. A. W., Stroebe, M. S., van den Bout, J., Stroebe, W., & Boelen, P. A. (2014). Is rumination after bereavement linked with loss avoidance? Evidence from eye-tracking. *PLOS ONE*, *9*(8), e104980. https://doi.org/10.1371/journal.pone.0104980

Eisma, M. C., & Stroebe, M. S. (2017). Rumination following bereavement: An overview. *Bereavement Care*, *36*(2), 58–64. https://doi.org/10.1080/02682621.2017.1349291

Eisma, M. C., Stroebe, M. S., Schut, H. A. W., Stroebe, W., Boelen, P. A., & van den Bout, J. (2013). Avoidance processes mediate the relationship between rumination and symptoms of complicated grief and depression following loss. *Journal of Abnormal Psychology*, *122*(4), 961–970. https://doi.org/10.1037/a0034051

Eisma, M. C., Stroebe, M. S., Schut, H. A. W., van den Bout, J., Boelen, P. A., & Stroebe, W. (2014). Development and psychometric evaluation of the Utrecht Grief Rumination Scale. *Journal of Psychopathology and Behavioral Assessment*, *36*(1), 165–176. https://doi.org/10.1007/s10862-013-9377-y

Fjærestad, A., Kristensen, P., Dyregrov, A., & Hjelen Stige, S. (2022). Grief trajectories among bereaved parents after the 2011 Utøya terror attack: A qualitative analysis. *Death Studies*, *1-14*, 847–860. https://doi.org/10.1080/07481187.2022.2135045

Heeke, C., Kampisiou, C., Niemeyer, H., & Knaevelsrud, C. (2017). A systematic review and meta-analysis of correlates of prolonged grief disorder in adults exposed to violent loss. *European Journal of Psychotraumatology*, *8*(sup6), 1583524. https://doi.org/10.1080/20008198.2019.1583524

Johnsen, I., Dyregrov, K., Matthiesen, S. B., & Laberg, J. C. (2021). Long-term reactions to the loss of a close friend in an extreme terror incident. *OMEGA - Journal of Death and Dying*, *82*(3), 351–369. https://doi.org/10.1177/0030222818814052

Killikelly, C., & Maercker, A. (2017). Prolonged grief disorder for ICD-11: The primacy of clinical utility and international applicability. *European Journal of Psychotraumatology*, *8*(sup6), 1476441. https://doi.org/10.1080/20008198.2018.1476441

Kristensen, P., Dyregrov, K., & Gjestad, R. (2020). Different trajectories of prolonged grief in bereaved family members after terror. *Frontiers in Psychiatry*, *11*, 545368. https://doi.org/10.3389/fpsyt.2020.545368

Lenferink, L. I. M., Eisma, M. C., de Keijser, J., & Boelen, P. A. (2017). Grief rumination mediates the association between self-compassion and psychopathology in relatives of missing persons. *European Journal of Psychotraumatology*, *8*(sup6), 1378052. https://doi.org/10.1080/20008198.2017.1378052

Levin-Aspenson, H. F., Watson, D., Ellickson-Larew, S., Stanton, K., & Stasik-O'Brien, S. M. (2021). Beyond distress and fear: Differential psychopathology correlates of PTSD symptom clusters. *Journal of Affective Disorders*, *284*, 9–17. https://doi.org/10.1016/j.jad.2021.01.090

Lundorff, M., Holmgren, H., Zachariae, R., Farver-Vestergaard, I., & O'Connor, M. (2017). Prevalence of prolonged grief disorder in adult bereavement: A systematic review and meta-analysis. *Journal of Affective Disorders*, *212*, 138–149. https://doi.org/10.1016/j.jad.2017.01.030

Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: The roles of hope, finding meaning, and rumination in the adjustment to bereavement among college students. *Death Studies*, *29*(5), 435–458. https://doi.org/10.1080/07481180590932544

Milman, E., Neimeyer, R. A., Fitzpatrick, M., MacKinnon, C. J., Muis, K. R., & Cohen, S. R. (2019). Rumination moderates the role of meaning in the development of prolonged grief symptomatology. *Journal of Clinical Psychology*, *75*(6), 1047–1065. https://doi.org/10.1002/jclp.22751

Morina, N. (2011). Rumination and avoidance as predictors of prolonged grief, depression, and posttraumatic stress in female widowed survivors of war. *The Journal of Nervous and Mental Disease*, *199*(12), 921–927. https://doi.org/10.1097/NMD.0b013e3182392aae

Moulds, M. L., Bisby, M. A., Wild, J., & Bryant, R. A. (2020). Rumination in posttraumatic stress disorder: A systematic review. *Clinical Psychology Review*, *82*, 101910. https://doi.org/10.1016/j.cpr.2020.101910

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*(4), 569–582. https://doi.org/10.1037/0021-843X.100.4.569

Nolen-Hoeksema, S. (2004). The response styles theory. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 107–123). Wiley.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*(5), 400–424. https://doi.org/10.1111/j.1745-6924.2008.00088.x

Nordström, E.-E. L., Thimm, J. C., Kaltiala, R., & Kristensen, P. (2022). Prolonged grief, post-traumatic stress, and functional impairment in parents and siblings 8 years after the 2011 Utøya terror attack. *European Journal of Psychotraumatology*, *13*(2), 2152930. https://doi.org/10.1080/20008066.2022.2152930

Parkes, C. M. (1998). Coping with loss: Bereavement in adult life. *BMJ*, *316*(7134), 856–859. https://doi.org/10.1136/bmj.316.7134.856

Pedersen, W. C., Denson, T. F., Goss, R. J., Vasquez, E. A., Kelley, N. J., & Miller, N. (2011). The impact of rumination on aggressive thoughts, feelings, arousal, and behaviour. *British Journal of Social Psychology*, *50*(2), 281–301. https://doi.org/10.1348/014466610X515696

Prigerson, H. G., Kakarala, S., Gang, J., & Maciejewski, P. K. (2021). History and status of prolonged grief disorder as a psychiatric diagnosis. *Annual Review of Clinical Psychology*, *17*(1), 109–126. https://doi.org/10.1146/annurev-clinpsy-081219-093600

Prigerson, H. G., Maciejewski, P. K., Reynolds Iii, C. F., Bierhals, A. J., Newsom, J. T., Fasiczka, A., Frank, E., Doman, J., & Miller, M. (1995). Inventory of complicated grief: A scale to measure maladaptive symptoms of loss. *Psychiatry Research*, *59*(1–2), 65–79. https://doi.org/10.1016/0165-1781(95)02757-2

R Core Team. (2023). *R: A language and environment for statistical computing (Version 4.2.3)*. R Foundation for Statistical Computing. http://www.R-project.org/

Rosner, R., Lumbeck, G., & Geissner, E. (2011). Effectiveness of an inpatient group therapy for comorbid complicated grief disorder. *Psychotherapy Research*, *21*(2), 210–218, Article Pii 933541418. https://doi.org/10.1080/10503307.2010.545839

Shaw, M., Rights, J. D., Sterba, S. K., & Flake, J. K. (2023). r2mlm: R-squared measures for multilevel models (Version 0.3.3). https://cran.r-project.org/web/packages/r2mlm/index.html

Shear, K., Frank, E., Houck, P. R., & Reynolds, C. F. (2005). Treatment of complicated grief: A randomized controlled trial. *JAMA: Journal of the American Medical Association*, *293*(21), 2601–2608. https://doi.org/10.1001/jama.293.21.2601

Shear, M. K. (2015). Complicated grief. *New England Journal of Medicine*, *372*(2), 153–160. https://doi.org/10.1056/NEJMcp1315618

Stroebe, M., Boelen, P. A., van den Hout, M., Stroebe, W., Salemink, E., & van den Bout, J. (2007). Ruminative coping as avoidance. *European Archives of Psychiatry and Clinical Neuroscience*, *257*(8), 462–472. https://doi.org/10.1007/s00406-007-0746-y

Sveen, J., Pohlkamp, L., Kreicbergs, U., & Eisma, M. C. (2019). Rumination in bereaved parents: Psychometric evaluation of the Swedish version of the Utrecht Grief Rumination Scale (UGRS). *PLoS ONE*, *14*(3), e0213152. https://doi.org/10.1371/journal.pone.0213152

Szabo, Y. Z., Warnecke, A. J., Newton, T. L., & Valentine, J. C. (2017). Rumination and posttraumatic stress symptoms in trauma-exposed adults: A systematic review and meta-analysis. *Anxiety, Stress, & Coping*, *30*(4), 396–414. https://doi.org/10.1080/10615806.2017.1313835

Tang, S., Eisma, M. C., Li, J., & Chow, A. Y. M. (2019). Psychometric evaluation of the Chinese version of the Utrecht Grief Rumination Scale. *Clinical Psychology & Psychotherapy*, *26*(2), 262–272. https://doi.org/10.1002/cpp.2348

Thimm, J. C., Davidsen, M., Elsness, M. M., & Vara, H. (2019). Reliability, factor structure, and validity of the Inventory of Complicated Grief (ICG) in a general bereaved sample in Norway. *Scandinavian Psychologist*, *6*, e7. https://doi.org/10.15714/scandpsychol.6.e7

van der Houwen, K., Stroebe, M., Schut, H., Stroebe, W., & van den Bout, J. (2010). Mediating processes in bereavement: The role of rumination, threatening grief interpretations, and deliberate grief avoidance. *Social Science & Medicine*, *71*(9), 1669–1676. https://doi.org/10.1016/j.socscimed.2010.06.047

Wagner, B., Knaevelsrud, C., & Maercker, A. (2005). Internet-based treatment for complicated grief: Concepts and case study. *Journal of Loss & Trauma*, *10*(5), 409–432. https://doi.org/10.1080/15325020590956828

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*(2), 163–206. https://doi.org/10.1037/0033-2909.134.2.163

Watkins, E. R., & Moulds, M. L. (2013). Repetitive thought: Rumination in complicated grief. In M. Stroebe, H. Schut, & J. van den Bout (Eds.), *Complicated grief: Scientific foundations for health care professionals* (pp. 162–175). Routledge/Taylor & Francis Group.

Weiss, D. S. (2007). The impact of event scale: Revised. In J. P. Wilson & C. S.-k. Tang (Eds.), *Cross-cultural assessment of psychological trauma and PTSD* (pp. 219–238). Springer. https://doi.org/10.1007/978-0-387-70990-1_10

World Health Organization. (2019/2021). International classification of diseases, Eleventh Revision (ICD-11). https://icd.who.int/browse11

Yanagida, T. (2023). misty: Miscellaneous functions (Version 0.4.8). https://cran.r-project.org/web/packages/misty/index.html

How to cite this article: Thimm, J. C., Kristensen, P., Aulie, I. F., Larsen, I. M., & Johnsen, I. (2024). The associations of grief-related rumination with prolonged grief and posttraumatic stress symptoms: A longitudinal study of bereaved after the 2011 terror attack in Norway. *Clinical Psychology & Psychotherapy*, *31*(1), e2950. https://doi.org/10.1002/cpp.2950