



Posttraumatic stress disorder and death anxiety among Iraqi civilians exposed to a suicide car bombing: the role of religious coping and attachment

Fuaad Mohammed Freh & Man Cheung Chung

To cite this article: Fuaad Mohammed Freh & Man Cheung Chung (2021): Posttraumatic stress disorder and death anxiety among Iraqi civilians exposed to a suicide car bombing: the role of religious coping and attachment, Journal of Mental Health, DOI: [10.1080/09638237.2021.1952954](https://doi.org/10.1080/09638237.2021.1952954)

To link to this article: <https://doi.org/10.1080/09638237.2021.1952954>



Published online: 15 Jul 2021.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Posttraumatic stress disorder and death anxiety among Iraqi civilians exposed to a suicide car bombing: the role of religious coping and attachment

Fuaad Mohammed Freh^a and Man Cheung Chung^b

^aDepartment of Psychology, University of Anbar, Anbar, Iraq; ^bDepartment of Educational Psychology, the Chinese University of Hong Kong, Shatin, Hong Kong

ABSTRACT

Background: Posttraumatic stress disorder (PTSD) as a result of a bombing has been studied in the literature. Limited studies have focused attention on PTSD following a suicide car bombing. However, more research is needed to explore the risk factors for this psychological response.

Aims: To examine a hypothesised model that death anxiety would be associated with PTSD and psychiatric comorbidity following a suicide car bombing, and that attachment styles and religious coping would influence the impact of this anxiety on distress outcomes.

Methods: 185 Iraqi civilians exposed to the first suicide car bombing completed questionnaires measuring PTSD, psychiatric comorbidity, death anxiety, religious coping, and attachment experiences.

Results: 82% met diagnostic criteria for PTSD, the remainder did not. Path analysis showed that death anxiety was significantly correlated with psychiatric comorbidity; it was also correlated with attachment, which was correlated with psychiatric comorbidity. Death anxiety was also significantly correlated with religious coping, which was correlated with both distress outcomes.

Conclusions: Although Iraqi civilians reported increased death anxiety following a suicide car bombing, those who used religion to cope with the traumatic experience and had functional attachment experiences in the past reported low levels of psychological distress.

ARTICLE HISTORY

Received 14 January 2021

Revised 29 June 2021

Accepted 30 June 2021

Published online 7 July 2021

KEYWORDS

Death anxiety; PTSD; bombing; religious coping; attachment

Introduction

It has been widely documented that civilians exposed to bombings can develop posttraumatic stress disorder (PTSD), with prevalence rates ranging from 34% to 58% (e.g. Duffy et al., 2013; North et al., 2011; Zhang et al., 2013), as well as psychiatric comorbidity such as anxiety and depression (e.g. Solberget et al., 2015; Tucker et al., 2018). The psychological burden of bombing can last for many years (Norris et al., 2002; North et al., 2011). However, the above studies did not focus on victims exposed to a suicide car bombing. Several studies have now argued that this type of attack is one of the most overwhelming traumatic experiences (Edwards, 2007). Victims exposed to such an attack may exhibit PTSD, psychiatric comorbidity, cognitive and emotional disturbances (Besser & Neria, 2012; Chung & Freh, 2019; Freh et al., 2013).

The current study examined a hypothesised model that death anxiety would be correlated with post-suicide car bombing PTSD and psychiatric comorbidity, and that the impact of this anxiety on distress outcomes would be influenced by attachment styles and religious coping (see Figure 1). Death anxiety is a form of anxiety caused by anticipating the state of being dead (Neimeyer, 1994). Considering that trauma can produce chronic hyperarousal states (Friedman, 2000; Schore, 2003), a suicide car bombing

can presumably increase levels of death anxiety (Florian et al., 1993; Tolstikova et al., 2005). Victims' difficulty in facing such death anxiety is likely to lead to high levels of psychological distress (Yalom, 2008).

Research has shown that death anxiety is associated with PTSD in victims of terrorism (Hamama-Raz et al., 2016), technological disasters (Chung et al., 2002, 2005), war (Roshdieh et al., 1998; Russell & Russell, 2019), and near-death experiences (Hoeltherhoff & Chung, 2013, 2017). In addition to death anxiety, trauma victims have also reported psychiatric comorbidity such as anxiety and depression (e.g. Chung et al., 2000, 2002, 2005; Hoeltherhoff & Chung, 2013, 2017). However, there is a dearth of research addressing the relationship between death anxiety, post-suicide car bombing PTSD, and psychiatric comorbidity, which was the rationale for the current research.

Related to the above knowledge gap, two other observations about death anxiety are worth noting. First, death is a given of our existence that develops across the lifespan. Parents play a role in enabling their children to suppress death anxiety (Yalom, 2008). According to attachment theory (Bowlby, 1969), the way we experience emotion or distress in childhood is tied to a secure base of whether parents or caregivers are available, responsive, emotionally accessible, and supportive when we are distressed and feel in need of help. Experiencing such security and the

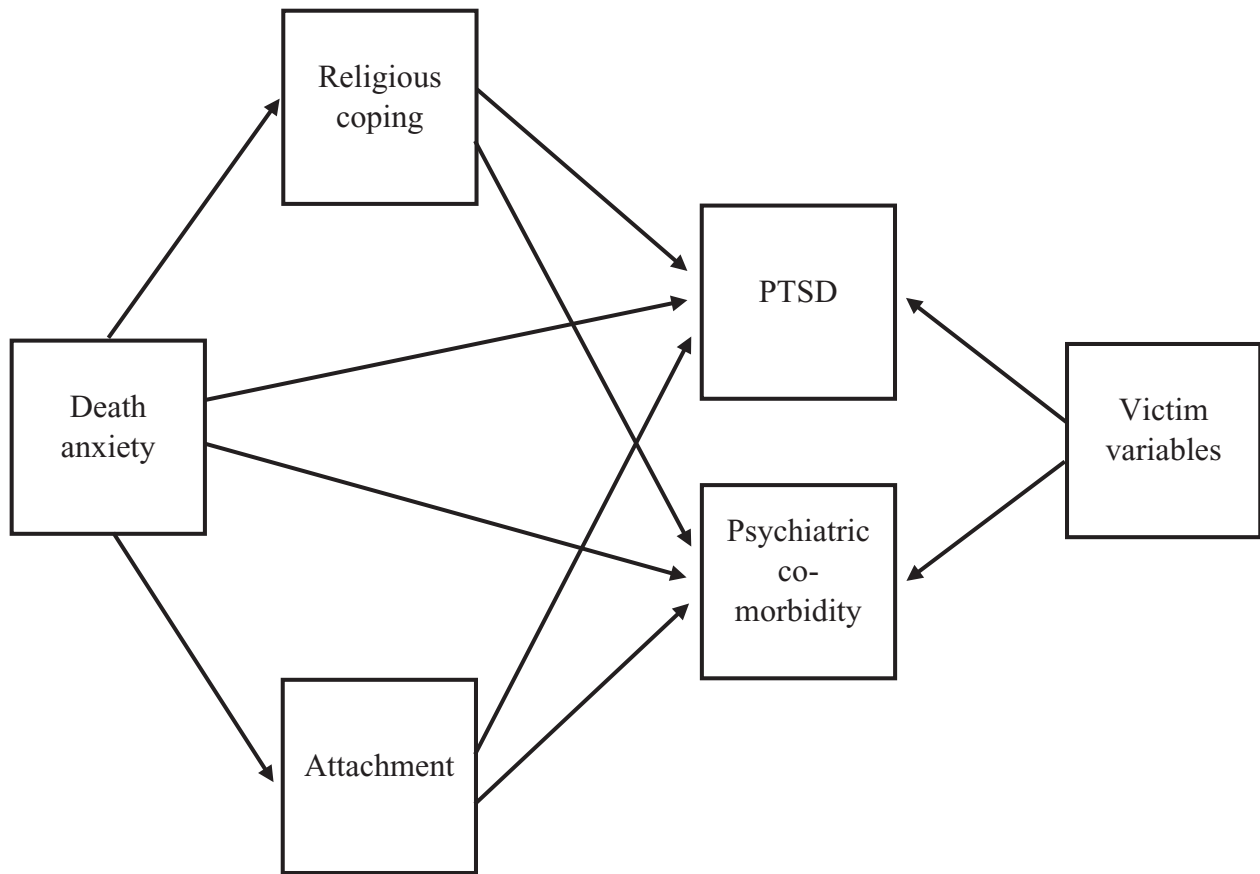


Figure 1. The hypothesised model.

subsequent feelings of relief and comfort from parents helps us face future difficulties with confidence (Cassidy, 1994; Waters & Waters, 2006). In other words, when this secure attachment is activated, it mitigates distress, promotes positive emotions, enhances adaptive coping strategies, and maintains psychological well-being (Mikulincer & Shaver, 2007, 2012). Secure individuals tend to feel less fearful of danger, less alone, and have feelings of permanence and support, which could reduce their fear of death (Mikulincer et al., 1990).

On the other hand, if care is deficient or insecure, the development of adaptive coping or emotion regulation strategies is interrupted. Consequently, individuals feel physically and emotionally insecure. This type of insecurity and the lack of role models for constructive or non-threatening expression of emotions can lead to ambivalence in expressing their own emotions. Instead, the emotions from their thoughts and actions create a sense of fear that they try to defend against. In one study, it was shown that cancer patients with an insecure attachment style had higher death anxiety scores than those with a secure attachment style (Valikhani et al., 2018). The impact of this relationship between death anxiety and attachment on post-suicide car bombing PTSD and psychiatric comorbidity is unknown. This question formed the second knowledge gap that the current study sought to address.

Second, if parents help their children deal with death anxiety at a young age, this may facilitate the development of coping strategies that can be used to manage this anxiety.

Having a religious faith has been shown to be an effective coping strategy, buffering feelings of existential despair and reducing fear of death (Alvarado et al., 1995; Lewis, 2014; Mohammadzadeh & Najafi, 2020). Religion can provide a platform to expand self-awareness, grapple with existential questions about life and death, become more empathetic, and compassionate toward others, and face emotional pain. It helps individuals to face death with equanimity, live in the present, and experience both the joy and pain of existence without resorting to illusions (Alvarado et al., 1995).

It has been postulated that religious coping is useful for Iraqis exposed to a suicide car bombing (Freh et al., 2013), although this hypothesis awaits empirical testing. A study that focused on Muslims exposed to war experiences found that those who had high levels of trauma exposure but low levels of religious beliefs tended to have high levels of death anxiety (Roshdieh et al., 1998). Similarly, positive religious coping signifies a secure relationship with God, others, and the world, which reduces death anxiety (Mohammadzadeh & Najafi, 2020). However, this relationship between death anxiety and religious coping is not without controversy. In a study of traumatised students in Lithuania, religious coping had no effect on death anxiety (Hoelterhoff & Chung, 2013). The extent to which religious coping related to death anxiety may influence post-suicide car bombing PTSD and psychiatric comorbidity remains unclear. This question was the third knowledge gap the current study sought to address.

In examining the hypothesised model presented above, the importance of “victim variables” should not be underestimated, as they have been shown to influence trauma responses and stress outcomes (Friedman et al., 2007; Vogt et al., 2007). We hypothesised that after controlling for victim variables, (1) death anxiety would be associated with PTSD and psychiatric comorbidity, and (2) death anxiety would also be associated with religious coping and attachment, which would also correlate with stress outcomes.

Methods

Procedure

One hundred and eighty-five participants exposed to a car bombing were recruited for this study from the Ministry of Health (MoH) and two hospitals in Ramadi and Fallujah. After obtaining permission, clinicians and nurses were familiarized with the purpose of the study, informed of the selection criteria, and asked to identify potential participants accordingly. The criteria were (1) Iraqi civilians, (2) first-time exposure to bombing, (3) 18 years of age or older, (4) ability to read and write, (5) onset of bombing was at least one month prior to the start of the study, (6) no psychiatric history, (7) no cognitive impairment, (8) no special needs, and (9) informed consent given.

The reason for excluding individuals with psychiatric history, cognitive impairment, or special needs was that co-occurrence of psychiatric disorders is associated with higher severity and poorer prognosis for both disorders (McHugh & Weiss, 2019). In addition, people with special needs tend to have more mental health problems than people without learning disabilities (Salazar et al., 2015). Therefore, the inclusion of these individuals could have inflated the distress outcomes for the present study.

Staff used computerized medical records of all bombing victims in the three organizations to identify participants who met these criteria. Two hundred and thirty individuals were identified and invited to participate by telephone, of whom 45 declined to participate, resulting in a final number of 185 participants ($n=97$, 52.4% from the MoH; $n=36$, 19.5% from Ramadi; and $n=52$, 28.1% from Fallujah). Those who agreed to participate were invited to the MoH or Anbar University in Iraq to complete the questionnaires (see Measures section). The questionnaires were translated from English to Arabic using the back translation process. During the translation process, the questions were reviewed and ensured that they were culturally appropriate for the Arab samples. The University of Anbar granted ethical approval for the research (UA, Ethical Approval Committee, no. 61).

Measures

A demographic page collected information on victim variables: Age, gender (1 = female, 2 = male), marital status (1 = single, 2 = married, 3 = divorced, 4 = widowed), education level (1 = primary, 2 = secondary, 3 = university), how

long ago the bombing occurred, whether they suffered an injury (0 = no, 1 = yes), felt their life was in danger after the bombing (0 = no, 1 = yes), helpless and terrified (0 = no, 1 = yes). Information about participants' ethnicity, whether this was the first bombing they had experienced, literacy, psychiatric history, cognitive impairment, and special needs status was collected from medical records.

The Posttraumatic Stress Diagnosis Scale (PDS) (Foa, 1995) assessed PTSD symptoms according to DSM-IV criteria with the car bombing as the index trauma. The PDS generates three subscales: Intrusion, avoidance, and hyperarousal. Participants rated the severity of symptoms using a rating scale: 0 = not at all to 3 = 5 or more times a week/ almost always. If the items on the questionnaire score 1 or higher, they are considered symptomatic. To receive a diagnosis of PTSD, there would need to be at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms. The PDS has shown good concurrent validity (0.81) with the Impact of Event Scale (Foa et al., & Perry, 1997). It has also demonstrated good reliability and validity and good agreement with the Structured Clinical Interview (SCI) for diagnosis ($\kappa = 0.65$, agreement = 82%, sensitivity = 0.89, and specificity = 0.75). In the current study, the Cronbach's alpha for the total score was 0.74.

The General Health Questionnaire-28 (GHQ-28) (Goldberg & Hillier, 1979) was used to assess general psychiatric symptomatology using the rating scale: 0 = not at all to 3 = much more than usual. It provides four subscales: somatic problems, anxiety, social dysfunction, and depression. The internal consistency of the scale calculated with Cronbach's alpha was 0.91, and the split-half consistency was 0.88. For the current study, the Cronbach's alpha for the total score was 0.91.

The Multidimensional Fear of Death Scale (MFODS) (Hoelter, 1979) was used to measure the intensity of participants' fear of death. Participants responded to the items of the questionnaire using Likert scale: 1 = strongly agree to 5 = disagree at all with a neutral mean. Low scores reflect greater fear of death. The scale generates 8 subscales including fear of the dying process, the dead and being destroyed. The psychometric properties of the MFODS have been tested (Barr & Cacciatore, 2008) with Cronbach's α -values ranging from 0.65 to 0.82. Based on the current study sample, the Cronbach's alpha for the total score was 0.92.

The Brief Arab Religious Coping Scale (BARCS) (Amer et al., 2008) was used to measure different types of religious coping strategies, such as praying, asking God for help, reciting Holy Books and religious stories, and getting help from religious leaders. Participants indicated the extent to which they used these strategies to cope with the effects of the bombing. They rated the items on the questionnaire using the rating scales: 0 = not used at all/does not apply to 3 = always used. This scale has a good Cronbach's alpha value (0.94) in the existing literature. For the current study, the Cronbach's alpha for the total score was 0.91.

The Relationship Scales Questionnaire (RSQ-30) (Griffin & Bartholomew, 1994) was used to measure the description of a prototypical attachment pattern applied to close

relationships in general, using a 5-point Likert scale (1 = not at all like me, 5 = very much like me). Attachment is a life-long phenomenon. Infants have internalized the relationship with the attachment figure as an internal working model that remains relatively stable over time and can be generalized to other relationships later in life (Mikulincer & Nachshon, 1991). Items were calculated to generate four subscales: secure, fearful, preoccupied and dismissing attachment styles. The questionnaire has adequate convergent and divergent validity as well as moderate to high test-retest reliability and stability over eight months (Scharfe & Bartholomew, 1994). The Cronbach's α of the total RSQ for the current sample was 0.91.

Data analysis

Descriptive statistics were used to describe the demographic characteristics of the sample. *T*-tests were used to compare between diagnostic groups in the psychological constructs examined in this study. Correlation coefficients, including point bi-serial correlations (r_{pb}), were used to examine whether demographic or victim variables were related to outcomes. Path analysis was conducted to examine model fit. All estimates of model parameters and fit statistics were examined using full information maximum likelihood. Meeting the following criteria would indicate a good model fit to the data: (1) a ratio of chi-square/d.f. under 3, (2) values of 0.95 or greater for the Tucker-Lewis Index (TLI), and (3) for the Incremental Fit Index (IFI), (4) a value of 0.06 or smaller for the root mean square error of approximation (RMSEA), (5) a value closer to 1 for the Comparative Fit Index (CFI), and (6) the Normal Fit Index (NFI).

Normality of the data was checked using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Due to non-normality, PTSD and psychiatric comorbidity totals were log-transformed. Exploration of casewise diagnostics revealed no outliers (Mahalanobis distance = 3 SD). Levene's test and linear regression plots were used to test assumptions regarding equality of variance and homoscedasticity, respectively. Expectation Maximisation (EM) algorithm (Enders, 2001) was used to replace missing data.

Results

One hundred and eighty-five Iraqi civilians (F = 94, M = 91) participated in the study. They were on average 31 years old (M = 30.93, SD = 8.92) and had experienced their first bombing a little over a month and a half before the study (M = 1.58, SD = 0.85). More than half (56%) were married; 43% were in the middle income range, followed by 41% in the lower income categories. Income levels were categorized by type of occupation. Thirty-nine percent had a high school diploma up to secondary level, followed by 33% at university level. Slightly more than half (53%) suffered an injury during the bombing and the majority (84%) felt helpless and terrified after the bombing and believed that their lives were in danger (80%).

Table 1. Diagnostic group differences in means and standard deviations of death anxiety, religious coping, attachment styles and psychiatric co-morbidity.

	No-PTSD		PTSD		<i>t</i>
	M	SD	M	SD	
Death anxiety	115.03	30.83	151.35	20.74	-6.45**
Religious coping	32.72	6.40	19.98	8.77	9.63**
Secure attachment	13.60	2.68	12.60	2.04	2.40*
Fearful attachment	8.75	4.85	14.73	4.35	-6.99**
Preoccupied attachment	9.93	2.95	12.48	2.47	-5.15**
Dismissing attachment	12.39	5.18	17.80	4.48	-6.10**
Psychiatric co-morbidity	23.93	9.83	46.55	10.75	-11.10**

* $p < 0.05$; ** $p < 0.01$.

Using the PDS diagnostic criteria, 82% met the criteria for PTSD and 18% did not have PTSD. There were significant differences between diagnostic groups on all psychological constructs examined in this study. The no-PTSD group had significantly lower death anxiety scores (i.e. higher death anxiety) than the PTSD group. They used significantly more religious coping and were more secure in attachment than the PTSD group. Otherwise, the PTSD group was significantly more fearful, preoccupied, and dismissive in attachment and reported significantly more psychiatric comorbid symptoms than the no-PTSD group (see Table 1).

Path analysis was conducted to examine the hypothesised model representing the relationship between death anxiety, post-suicide car bombing PTSD, and psychiatric comorbidity, and whether attachment styles and religious coping would be related to this relationship. Prior to analysis, correlation coefficients (including bi-serial point correlations) were run to determine if the victim variables were related to the outcomes (PTSD and psychiatric comorbidity). Those that were significantly correlated with the outcomes were then treated as covariates in path analysis. Results showed that physical injury, feeling of danger to life, and feeling helpless and afraid were significantly related to PTSD (Injury, $r_{pb} = 0.18$, $p < 0.05$; Danger, $r_{pb} = 0.24$, $p < 0.01$; Helplessness, $r_{pb} = 0.62$, $p < 0.01$) and psychiatric comorbidity (Injury, $r_{pb} = 0.23$, $p < 0.01$; Danger, $r_{pb} = 0.32$, $p < 0.01$; Helplessness, $r_{pb} = 0.63$, $p < 0.01$). After controlling for these victim variables, initial model fit was poor [CMIN/DF = 11.08; TLI = 0.41; IFI = 0.77; RMSEA = 0.23, 90% CI = 0.19–0.27; CFI = 0.77; NFI = 0.76]. After reviewing the estimates for the regression weights and covariates, the variables of feeling life threatened, helpless, and terrified, and the path from death anxiety to PTSD were removed, but the covariates (e1 and e2, e2 and e3, e1 and e4) were added. These changes resulted in the final model fit [CMIN/DF = 1.59; TLI = 0.97; IFI = 0.99; RMSEA = 0.05, 90% CI = 0.00–0.12; CFI = 0.99; NFI = 0.98]. Death anxiety was significantly correlated with psychiatric comorbidity; it was also significantly correlated with attachment, which was correlated with psychiatric comorbidity. Death anxiety was also significantly correlated with religious coping, which was correlated with both distress outcomes (see Figure 2). To further analyze the data and include each attachment style in the path analysis, model fits were good for all attachment styles except secure attachment

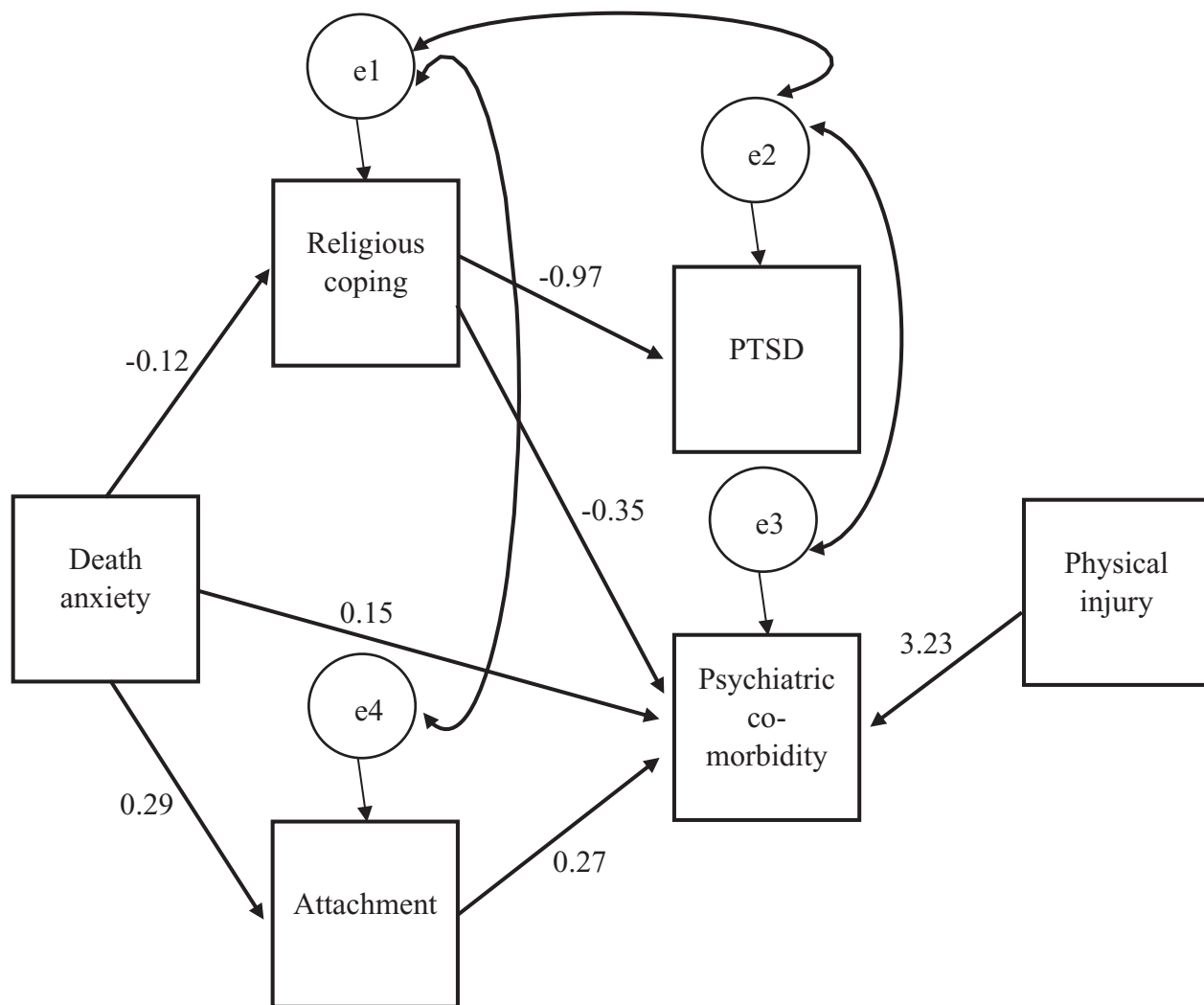


Figure 2. The final model. Based on the estimated standard errors, all paths shown are significant at 5% or better.

Table 2. The path model results for attachment styles.

	CMIN/DF	TLI	IFI	RMSEA	90% CI	CFI	NFI
Secure attachment	2.28	0.91	0.97	0.08	0.01–0.14	0.97	0.95
Fearful attachment	1.66	0.97	0.99	0.06	0.00–0.13	0.99	0.97
Preoccupied attachment	1.56	0.97	0.99	0.05	0.00–0.12	0.99	0.97
Dismissing attachment	1.54	0.97	0.99	0.05	0.00–0.12	0.99	0.97

(see Table 2). They shared the same significant paths between latent variables as those in the overall model.

Discussion

The present study examined a hypothesised model that death anxiety would have an impact on post-suicide car bombing PTSD and psychiatric comorbidity. Additionally, attachment styles and religious coping were hypothesised to influence the impact of this anxiety on distress outcomes. The finding that death anxiety correlated with psychiatric comorbidity but not with PTSD differs from the literature reviewed in the introduction. Prior to the inclusion of religious coping in the path model, death anxiety was indeed significantly correlated with PTSD (Estimate = 0.11, S.E. = 0.016, C.R. = 7.31, $p < 0.001$). However, after inclusion, this path became non-significant (Estimate = 0.01, S.E. = 0.04,

C.R. = 0.35, ns). Therefore, one might speculate a full mediational effect with religious coping as a mediator, although this speculation cannot be tested here due to the lack of temporal precedence in cross-sectional data (Cole & Maxwell, 2003). Although religion is intertwined with the Iraqi civilian lifestyle, the degree to which religion was used to cope with the effects of the bombing varied considerably ($M = 144.87$, $SD = 26.70$, range: 43–210). After inspecting the regression weight estimates for the paths, death anxiety, religious coping, and distress outcomes were all negatively correlated. In other words, increased death anxiety (low scores reflect greater death anxiety) was associated with increased religious coping, which was associated with reduced levels of PTSD and psychiatric comorbidity.

While exposure to the bombing undoubtedly increased death anxiety, according to terror management theory (Pyszczynski & Kesebir, 2011; Solomon et al., 1991), this anxiety may have been exacerbated by an internal conflict in which they knew they could not avoid death while struggling to sustain themselves. This conflict resulted in a great deal of distress. To protect themselves, they resorted to psychological defenses aimed at removing awareness of death from consciousness by relying on their own cultural beliefs.

A religious belief in an afterlife provided a symbolic protection that bolstered their sense of self-worth and subsequently provided a sense of purpose and control over the terror. This process was an attempt to change the way they evaluated their current stressful situation (i.e. the bombing). In the process, some buffering effects against PTSD and psychiatric comorbidity appeared to emerge in these civilians.

Religious coping may have been similar to automatic rumination, where frequent praying for their safety may have led to a reappraisal of their situation. This rumination could impact cognitive schema, lead to wisdom (Park & Folkman, 1997; Tedeschi et al., 1998), buffer against death-related psychological stress (e.g. reducing PTSD and psychiatric comorbidity) (Greenberg et al., 1997), and strengthen resilience. It also provides meaning, order, purpose in life, and improves coping skills (Eriksson & Yeh, 2012; Pargament, 2011). This psychological response is consistent with research suggesting that religion, a component of Arab cultural identity, can strengthen mental health (Abdel-Khalek & Lester, 2017).

Findings on the relationship between death anxiety, attachment, and psychiatric comorbidity have not supported the hypothesis that securely attached individuals tend to experience less death anxiety than insecurely attached individuals (Mikulincer et al., 1990). Instead, fearful, preoccupied, and dismissive attachments appear to play a more critical role in the model. *Prima facie*, the results seemed contradictory. High levels of death anxiety (i.e. a low score on death anxiety) were associated with low levels of anxious, preoccupied, and dismissive attachment styles, which were also associated with low levels of psychiatric comorbidity. It could be that the collectivist nature of Arab culture, which emphasizes and advocates the interdependence, harmonious relationships, connectedness with others, mutual obligation, and social support (Jayawickreme et al., 2013; Oyserman & Lee, 2008), reduced the extent of fearful, dismissive, or preoccupied types of attachment styles, which could have resulted in lower psychiatric comorbidity (Mikulincer et al., 2009).

It is noteworthy that these attachment styles were associated with reduced general mental disorder symptoms and not trauma-related PTSD symptoms. This finding is consistent with one study suggesting that attachment styles are not always correlated with PTSD symptoms (Berry et al., 2006). In other words, while attachment experiences may play a critical role in regulating distress and maintaining psychological well-being (Mikulincer & Shaver, 2007, 2012), such experiences may be associated with specific distress symptoms. For example, anxious and fearful attachment styles have been associated with self-esteem problems, aversive attachment with hostility, emotional detachment, anxious attachment with dominance, and aggression. These attachment styles could reflect different levels of anxiety and avoidance that tend to influence specific psychological symptoms (Bartholomew, 1990, 1997; Berry et al., 2006). Conversely, low levels of dysfunctional attachment styles (anxious, preoccupied, and aversive styles) could be associated with low levels of anxiety and avoidance, resulting in

low levels of specific symptoms, in this case as measured by general psychological disorder symptoms.

It is worth noting that a paradoxical phenomenon was observed in the reported results. While levels of PTSD and psychiatric comorbidity were low, death anxiety remained at high levels in the interaction between death anxiety, religious coping, and distress outcomes. Similarly, the interaction between death anxiety, attachment, and psychiatric comorbidity among Iraqi civilians revealed low levels of psychiatric comorbidity while high levels of death anxiety were observed. Perhaps death anxiety among these Iraqi civilians reflected what existential psychologists refer to as the ultimate concern, that is, awareness of our inevitable death or mortality (Yalom, 1980). Such a concern will always play a key role in our consciousness. A traumatic event (in this case, a bombing) would only reinforce its deep-seated presence in consciousness. The high level of awareness of this ultimate concern could persist regardless of the various levels of religious coping, the various types of attachment experiences, and the various levels of suffering that people reported.

The overall findings of this study have important implications for the design of psychological interventions for people exposed to a suicide car bombing. Interventions should take into account the impact that fear of death might have on victims' psychological distress. At the same time, treatment should be flexible enough to integrate the practice of religious coping. Finally, identifying and reducing dysfunctional attachment styles should also be part of treatment. In other words, treatment should be integrative and bring together different approaches.

Several limitations of the study must be acknowledged. First, this study was cross-sectional, therefore limiting the ability to test whether religious coping and attachment styles mediate the influence of death anxiety on distress outcomes; a longitudinal design would provide a stronger test of the hypothesis (Cole & Maxwell, 2003). Second, due to the limited sample size, full structural equation modelling was not conducted. Therefore, we were unable to arrive at models that would inform us of a structural model representing the relationship between latent and manifest variables. Third, different results might have been found if different types of death anxiety and religious coping been considered. For example, research has shown that people who use negative religious coping tend to report higher death anxiety scores than those who use positive religious coping (Mohammadzadeh & Najafi, 2020). Finally, although excluding participants with a psychiatric history or cognitive impairment might have prevented the inclusion of individuals with even higher distress scores, and was a reasonable approach to understand the average Iraqi citizen, these effects of trauma were arguably the ones most affected by the bombing and most in need of help. Unfortunately, no information was collected on these individuals with coexisting symptoms, so further analysis was not possible.

To conclude, Iraqi civilians exhibited some paradoxical psychological responses following a suicide car bombing. While they experienced high levels of death anxiety, they

reported lower levels of distress, particularly those who used religion to cope with the bombing experience and who had a more functional attachment experience.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

- Abdel-Khalek, A. M., & Lester, D. (2017). The association between religiosity, generalized self-efficacy, mental health, and happiness in Arab college students. *Personality and Individual Differences*, 109, 12–16. <https://doi.org/10.1016/j.paid.2016.12.010>
- Alvarado, K. A., Templer, D. I., Bresler, C., & Thomas-Dobson, S. (1995). The relationship of religious variables to death depression and death anxiety. *Journal of Clinical Psychology*, 51(2), 202–204. [https://doi.org/10.1002/1097-4679\(199503\)51:2<202::AID-JCLP2270510209>3.0.CO;2-M](https://doi.org/10.1002/1097-4679(199503)51:2<202::AID-JCLP2270510209>3.0.CO;2-M)
- Amer, M. M., Hovey, J. D., Fox, C. M., & Rezcallah, A. (2008). Initial development of the Brief Arab Religious Coping Scale (BARCS). *Journal of Muslim Mental Health*, 3(1), 69–88. <https://doi.org/10.1080/15564900802156676>
- Barr, P., & Cacciatore, J. (2008). Personal fear of death and grief in bereaved mothers. *Death Studies*, 32(5), 445–460. <https://doi.org/10.1080/07481180801974752>
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships*, 7(2), 147–178. <https://doi.org/10.1177/0265407590072001>
- Bartholomew, K. (1997). Adult attachment processes: Individual and couple perspectives. *British Journal of Medical Psychology*, 70(3), 249–263. <https://doi.org/10.1111/j.2044-8341.1997.tb01903.x>
- Berry, K., Wearden, A., Barrowclough, C., & Liversidge, T. (2006). Attachment styles, interpersonal relationships and psychotic phenomena in a non-clinical student sample. *Personality and Individual Differences*, 41(4), 707–718. <https://doi.org/10.1016/j.paid.2006.03.009>
- Besser, A., & Neria, Y. (2012). When home isn't a safe haven: Insecure attachment orientations, perceived social support, and PTSD symptoms among Israeli evacuees under missile threat. *Psychological Trauma: Theory, Research, Practice, and Policy*, 4(1), 34–46.
- Bowlby, J. (1969). *Attachment and loss*. Basic Books.
- Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, 59(2–3), 228–283.
- Chung, M. C., & Freh, F. M. (2019). The trajectory of bombing-related posttraumatic stress disorder among Iraqi civilians: Shattered world assumptions and altered self-capacities as mediators; attachment and crisis support as moderators. *Psychiatry Research*, 273, 1–8. <https://doi.org/10.1016/j.psychres.2019.01.001>
- Chung, M. C., Chung, C., & Easthope, Y. (2000). Traumatic stress and death anxiety among community residents exposed to an aircraft crash. *Death Studies*, 24(8), 689–704.
- Chung, M. C., Dennis, I., Easthope, Y., Werrett, J., & Farmer, S. (2005). A multiple-indicator multiple-cause model for posttraumatic stress reactions: Personality, coping, and maladjustment. *Psychosomatic Medicine*, 67(2), 251–259. <https://doi.org/10.1097/01.psy.0000155675.56550.5f>
- Chung, M. C., Werrett, J., Easthope, Y., Farmer, S., & Chung, C. (2002). Traumatic stress and death anxiety among community residents exposed to a train crash. *OMEGA - Journal of Death and Dying*, 45(2), 133–147. <https://doi.org/10.2190/JGK9-QB71-5QP4-56G5>
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, 112(4), 558–577. <https://doi.org/10.1037/0021-843X.112.4.558>
- Duffy, M., Bolton, D., Gillespie, K., Ehlers, A., & Clark, D. M. (2013). A community study of the psychological effects of the Omagh car bomb on adults. *PLoS ONE*, 8(9), e76618. <https://doi.org/10.1371/journal.pone.0076618>
- Edwards, J. (2007). Posttraumatic stress: An empirical analysis of gender and developmental stage following the Oklahoma city bombing (Oklahoma). *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 67(10-B), 6051.
- Enders, C. K. (2001). A primer on maximum likelihood algorithms available for use with missing data. *Structural Equation Modeling: A Multidisciplinary Journal*, 8(1), 128–141. https://doi.org/10.1207/S15328007SEM0801_7
- Eriksson, C. B., & Yeh, D.-A. (2012). Grounded transcendence: Resilience to trauma through spirituality and religion. In K. Gow & M. J. Celinski (Eds.), *Individual trauma: Recovering from deep wounds and exploring the potential for renewal* (pp. 53–71, ix, 400 pp.). Nova Science Publishers.
- Florian, V., Mikulincer, M., & Green, E. (1993). Fear of personal death and the MMPI profile of middle-age men: The moderating impact of personal losses. *Omega: Journal of Death and Dying*, 28(2), 151–164.
- Foa, E. B. (1995). *The posttraumatic stress diagnostic scale*. National Computer Systems.
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder. The posttraumatic diagnostic scale. *Psychological Assessment*, 9(4), 445–451. <https://doi.org/10.1037/1040-3590.9.4.445>
- Freh, F. M., Chung, M. C., & Dallos, R. (2013). In the shadow of terror: Posttraumatic stress and psychiatric co-morbidity following bombing in Iraq: The role of shattered world assumptions and altered self-capacities. *Journal of Psychiatric Research*, 47(2), 215–225. <https://doi.org/10.1016/j.jpsychires.2012.10.008>
- Freh, F. M., Dallos, R., & Chung, M. C. (2013). The impact of bombing attacks on civilians in Iraq. *International Journal for the Advancement of Counselling*, 35(4), 273–285. <https://doi.org/10.1007/s10447-013-9182-z>
- Friedman, M. J. (2000). What might the psychobiology of posttraumatic stress disorder teach us about future approaches to pharmacotherapy? *The Journal of Clinical Psychiatry*, 61(Suppl7), 44–51.
- Friedman, M., Keane, T., & Resick, P. (Eds.). (2007). *Handbook of PTSD: Science and practice*. Guilford.
- Goldberg, D., & Hillier, V. (1979). A scaled version of the general health questionnaire. *Psychological Medicine*, 9(1), 139–145. <https://doi.org/10.1017/s0033291700021644>
- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 61–139, ix, 366 pp.). Academic Press.
- Griffin, D., & Bartholomew, K. (1994). Models of the self and other: Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology*, 67(3), 430–445. <https://doi.org/10.1037/0022-3514.67.3.430>
- Hamama-Raz, Y., Mahat-Shamir, M., Picho-Prelorentzos, S., Zaken, A., David, Y. Y., Ben-Ezra, M., & Bergman, Y. S. (2016). The link between death anxiety and post-traumatic symptomatology during terror: Direct links and possible moderators. *Psychiatry Research*, 245, 379–386.
- Hoelter, J. W. (1979). Multidimensional treatment of fear of death. *Journal of Consulting and Clinical Psychology*, 47(5), 996–999. <https://doi.org/10.1037/0022-006X.47.5.996>
- Hoelterhoff, M., & Chung, M. C. (2013). Death anxiety and well-being: Coping with life-threatening events. *Traumatology*, 19(4), 280–291. <https://doi.org/10.1177/1534765613477499>
- Hoelterhoff, M., & Chung, M. C. (2017). Death anxiety resilience: A mixed methods investigation. *Psychiatric Quarterly*, 88, 635–651.
- Jayawickreme, N., Jayawickreme, E., & Foa, E. B. (2013). Using the individualism-collectivism construct to understand cultural differences in PTSD. In K. M. Gow & M. J. Celinski (Eds.), *Mass trauma: Impact and recovery issues* (pp. 55–76). Nova Science Publishers.

- Lewis, A. M. (2014). Terror management theory applied clinically: Implications for existential-integrative psychotherapy. *Death Studies*, 38(6–10), 412–417. <https://doi.org/10.1080/07481187.2012.753557>
- McHugh, R. K., & Weiss, R. D. (2019). Alcohol use disorder and depressive disorders. *Alcohol Research*, 40(1), 1–8.
- Mikulincer, M., & Nachshon, O. (1991). Attachment styles and patterns of self-disclosure. *Journal of Personality and Social Psychology*, 61(2), 321–331. <https://doi.org/10.1037/0022-3514.61.2.321>
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change* (578 pp.). Guilford Press.
- Mikulincer, M., & Shaver, P. R. (2012). Attachment theory expanded: A behavioral systems approach. In K. Deaux & M. Snyder (Eds.), *The Oxford handbook of personality and social psychology* (pp. 467–492, xvii, 858 pp.). Oxford University Press.
- Mikulincer, M., Florian, V., & Tolmacz, R. (1990). Attachment styles and fear of personal death: A case study of affect regulation. *Journal of Personality and Social Psychology*, 58(2), 273–280. <https://doi.org/10.1037/0022-3514.58.2.273>
- Mikulincer, M., Shaver, P. R., Sapir-Lavid, Y., & Avihu-Kanza, N. (2009). What's inside the minds of securely and insecurely attached people? The secure-base script and its associations with attachment-style dimensions. *Journal of Personality and Social Psychology*, 97(4), 615–633. <https://doi.org/10.1037/a0015649>
- Mohammadzadeh, A., & Najafi, M. (2020). The comparison of death anxiety, obsession, and depression between Muslim population with positive and negative religious coping. *Journal of Religion and Health*, 59, 1055–1064.
- Neimeyer, R. A. (1994). *Death anxiety handbook: Research, instrumentation, and application* (xvi, 284 pp.). Taylor & Francis.
- Norris, F. H., Friedman, M. J., & Watson, P. J. (2002). 60,000 disaster victims speak: Part II. Summary and implications of the disaster mental health research. *Psychiatry: Interpersonal and Biological Processes*, 65(3), 240–260. <https://doi.org/10.1521/psyc.65.3.240.20169>
- North, C. S., Pfefferbaum, B., Kawasaki, A., Lee, S., & Spitznagel, E. L. (2011). Psychosocial adjustment of directly exposed survivors 7 years after the Oklahoma City bombing. *Comprehensive Psychiatry*, 52(1), 1–8. <https://doi.org/10.1016/j.comppsy.2010.04.003>
- Oyserman, D., & Lee, S. W. S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, 134(2), 311–342. <https://doi.org/10.1037/0033-2909.134.2.311>
- Pargament, K. I. (2011). Religion and coping: The current state of knowledge. In S. Folkman (Ed.), *The Oxford handbook of stress, health, and coping* (pp. 269–288, xvi, 469 pp.). Oxford University Press.
- Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology*, 1(2), 115–144. <https://doi.org/10.1037/1089-2680.1.2.115>
- Pyszczynski, T., & Kesebir, P. (2011). Anxiety buffer disruption theory: A terror management account of posttraumatic stress disorder. *Anxiety, Stress & Coping: An International Journal*, 24(1), 3–26. <https://doi.org/10.1080/10615806.2010.517524>
- Roshdieh, S., Templer, D. I., Cannon, W. G., & Canfield, M. (1998). The relationships of death anxiety and death depression to religion and civilian war-related experiences in Iranians. *Omega: Journal of Death and Dying*, 38(3), 201–210.
- Russell, D. W., & Russell, C. A. (2019). The stress bias in mental health reporting: Death anxiety biases mental health self-assessments amongst deployed soldiers. *Psychological Services*, 18(2), 237–248.
- Salazar, F., Baird, G., Chandler, S., Tseng, E., O'sullivan, T., Howlin, P., Pickles, A., & Simonoff, E. (2015). Co-occurring psychiatric disorders in preschool and elementary school-aged children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 45(8), 2283–2294. <https://doi.org/10.1007/s10803-015-2361-5>
- Scharfe, E., & Bartholomew, K. (1994). Reliability and stability of adult attachment patterns. *Personal Relationships*, 1(1), 23–43. <https://doi.org/10.1111/j.1475-6811.1994.tb00053.x>
- Schore, A. N. (2003). Journal of Analytical Psychology: Guest editorial. *The Journal of Analytical Psychology*, 48(2), iii–vii.
- Solberg, O., Blix, I., & Heir, T. (2015). The aftermath of terrorism: Posttraumatic stress and functional impairment after the 2011 Oslo bombing. *Frontiers in Psychology*, 6, 1156. <https://doi.org/10.3389/fpsyg.2015.01156>
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). Terror management theory of self-esteem. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective*. (pp. 21–40, xxii, 878 pp.). Pergamon Press.
- Tedeschi, R. G., Park, C. L., & Calhoun, L. G. (1998). *Posttraumatic growth: Positive transformations in the aftermath of crisis*. Lawrence Erlbaum Associates Publishers.
- Tolstikova, K., Fleming, S., & Chartier, B. (2005). Grief, complicated grief, and trauma: The role of the search for meaning, impaired self-reference, and death anxiety. Special issue: Illness. *Crisis & Loss*, 13(4), 293–313. <https://doi.org/10.1177/105413730501300402>
- Tucker, P., Pfefferbaum, B., Nitiema, P., Wendling, T. L., & Brown, S. (2018). Do direct survivors of terrorism remaining in the disaster community show better long-term outcome than survivors who relocate? *Community Mental Health Journal*, 54(4), 429–437. <https://doi.org/10.1007/s10597-017-0160-5>
- Valikhani, A., Sarafraz, M. R., & Moghimi, P. (2018). Examining the role of attachment styles and self-control in suicide ideation and death anxiety for patients receiving chemotherapy in Iran. *Psycho-Oncology*, 27(3), 1057–1060. <https://doi.org/10.1002/pon.4466>
- Vogt, D., King, D., & King, L. (2007). Risk pathways in PTSD: Making sense of the literature. In M. Friedman, T. Kean, & P. Resick (Eds.), *Handbook of PTSD: Science and practice* (pp. 99–116). Guilford.
- Waters, H. S., & Waters, E. (2006). The attachment working models concept: Among other things, we build script-like representations of secure base experiences. *Attachment & Human Development*, 8(3), 185–197. <https://doi.org/10.1080/14616730600856016>
- Yalom, I. D. (1980). *Existential psychotherapy* (xii, 524 pp.). Basic Books.
- Yalom, I. D. (2008). *Staring at the sun: Overcoming the terror of death* (viii, 306 pp.). Jossey-Bass.
- Zhang, G., North, C. S., Narayanan, P., Kim, Y.-S., Thielman, S., & Pfefferbaum, B. (2013). The course of postdisaster psychiatric disorders in directly exposed civilians after the US Embassy bombing in Nairobi, Kenya: A follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, 48(2), 195–203. <https://doi.org/10.1007/s00127-012-0535-4>