


# The Impact of Death Anxiety, Meaning and Coping on Posttraumatic Stress Disorder and Psychiatric Co-Morbidity Among Iraqi Civilians Exposed to a Car Bomb Attack A Latent Class Analysis

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## Abstract

Much has been documented that the experience of a bombing is associated with posttraumatic stress disorder and psychiatric co-morbidity. Whether the co-existing relationship between death anxiety, meaning in life and coping styles would influence the aforementioned association is unknown. The present study aimed to identify latent classes of victims with different levels of death anxiety, meaning in life and coping styles, and to examine whether the severity of PTSD and co-morbid psychiatric symptoms differed between classes. One hundred and eighty-five victims who had experienced the first car bombing completed a demographic page, the Posttraumatic Stress Diagnosis Scale, General Health Questionnaire-28, Multidimensional Fear of Death Scale, Meaning in Life Questionnaire and Coping Responses Inventory. The results showed that 82% and 18% of the victims met the criteria for PTSD and no-PTSD, respectively. Four classes of

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victims were identified: Class 1 victims were approach copers with low levels of death anxiety and meaning. Class 2 victims were minimal copers with high levels of death anxiety and meaning. Class 3 victims were approach copers with a high level of death anxiety and meaning. Class 4 victims were avoidance copers with high levels of death anxiety. Individuals in Class 1 reported significantly lower levels of PTSD and psychiatric co-morbidity than the other three classes. Class 3 victims also reported significantly lower levels of psychiatric co-morbidity than Class 2 victims. To conclude, victims exposed to a car bombing were likely to exhibit posttraumatic stress symptoms in addition to other psychological symptoms. The severity of these symptoms tended to be lower among those who had little fear of death, did not search for meaning in life and approached their distress proactively.

### **Keywords**

death anxiety, meaning, coping, bombing, latent class analysis

### **Introduction**

Posttraumatic stress disorder (PTSD) can occur after a bombing, of which a suicide car bombing is considered one of the most overwhelming experiences (e.g. [Duffy et al., 2013](#); [North et al., 2011](#); [Zhang et al., 2013](#)) along with comorbid psychiatric symptoms such as anxiety, depression, substance abuse and functional impairment (e.g. [Chung & Freh, 2019](#); [Freh et al., 2013](#); [Solberg et al., 2015](#); [Tucker et al., 2018](#)). The effects of these symptoms can be detrimental and long-lasting ([Norris et al., 2002](#); [North et al., 2011](#)). Surprisingly, despite the extreme threat to life posed by a suicide car bombing, death anxiety has not been a focus of study. Death anxiety can be defined as a conscious or unconscious defence mechanism that people use to defend themselves against the threat of death ([Kesebir et al., 2011](#)). It is also conceptualised as a feeling of uncertainty, anxiety or fear related to a death ([Malinauskaite et al., 2017](#)). It is an existential concern which often occurs after a traumatic event ([Lo et al., 2017](#)) and has been associated with increased severity of PTSD ([Hamama-Raz et al., 2016](#)) and terrorism catastrophising in victims of terrorism ([Doak & Katsikitis, 2018](#)). Death anxiety is also associated with PTSD in victims exposed to, for example, technological disasters ([Chung et al., 2005](#)), war ([Russell & Russell, 2019](#)), HIV ([Safren et al., 2003](#)), and near-death experiences ([Hoelterhoff & Chung, 2017](#)). Death anxiety is a transdiagnostic construct that affects not only PTSD symptoms but also co-morbid psychiatric disorders ([Chung et al., 2005](#); [Hoelterhoff & Chung, 2017](#); [Menzies et al., 2019](#); [Russell & Russell, 2019](#)).

Addressing this gap in knowledge about the relationship between death anxiety, post-suicide car bombing PTSD and psychiatric co-morbidity was the first aim of the current research. In doing so, it was important to consider a number of

observations. First, heightened awareness of death from a life-threatening event (in this case, a bombing) may also be a reminder of a life filled with meaning (Routledge & Juhl, 2010). According to terror management theory (Pyszczynski & Kesebir, 2011), heightened awareness of one's mortality can increase motivation for the pursuit of meaning, which is a response to coping with present and future suffering (Halama, 2014; Miao et al., 2017) and mitigates negative emotions. Park's (Park, 2013) model of meaning-making also states that trauma (a bombardment associated with a heightened sense of mortal fear) can shake people's assumed world (Janoff-Bulman, 1992). A conflict has arisen consequently between the global belief that the world is safe and the situational belief that the world was unsafe when this incident occurred, causing suffering. To deal with this suffering, a meaning-making process is triggered in which the victims assimilate the experience of the bombing with the previously held global beliefs. In this way, they feel that they can re-establish a sense of control and predictability and thus feel less distressed. For example, for survivors of the 9/11 terrorist attacks and the Madrid bombings, the search for meaning was associated with a reduction in anxiety and PTSD symptoms (Updegraff et al., 2008). For victims of other types, meaning in life has also been associated with reduced PTSD symptoms (Herr & Buchanan, 2020), increased positive affect (Evram & Çakici Eş, 2020), and psychological and physical well-being (Park et al., 2008). On the other hand, the inability to find meaning can lead to feelings of despair (Bowes et al., 2002).

Second, the search for meaning can facilitate a coping process (Kinney et al., 2019), in which victims make a conscious decision to approach suffering by making sense of what has happened to them (Joseph, 2011). In this way, they can mitigate traumatic effects (Kinney et al., 2019) and affective symptoms (Krok et al., 2019), reduce the perceived threat of the situation but increase psychological adjustment (Halama, 2014). Changes in this proactive coping are associated with changes in the degree of meaning in one's life (Miao et al., 2017). In this sense, this coping process can be conceptualised as a form of approach coping style, which is considered adaptive coping and a protective factor for mental health problems (Hooker et al., 2018; Weathers et al., 2016). For example, looking at the victims of the Oklahoma City bombing and the 9/11 attacks, social support, sharing with others and participation in public and group activities are common forms of approach coping and have contributed significantly to recovery and good prognosis (North et al., 1999; Schuster et al., 2001). Meanwhile, the lack of social support contributed to psychological distress and depression following the bombings and 9/11 (Paez et al., 2007; Shahar et al., 2009). The approach coping style is the opposite of avoidance coping which aims to detach and move away from distressing emotions. By and large, avoidance coping tends to be ineffective in managing anxiety over time because it does not address the threat to one's existence (Carver & Connor-Smith, 2010). On the other hand, cancer survivors who exhibit high levels of meaning in life but low levels of avoidant coping tend to adapt better (Schnoll et al., 2002).

A co-existing relationship between death anxiety, meaning in life and coping style (approach or avoidance) has been presented that may impact on PTSD and psychiatric co-morbidity. This model has never been explored in victims of a post-suicide car bomb attack, which is the second gap in knowledge that the present study aimed to fill. A person-centred approach of latent class analysis (LCA) is used. Based on their response patterns in terms of fear of death, meaning in life and coping styles, discrete subgroups (classes) of bombing victims would be identified that share similar response patterns. While homogeneity is found between individuals within each subgroup, heterogeneity is found between individuals in different subgroups (Lubke & Muthen, 2007). Subsequently, the aim was to investigate whether these subgroups would differ in terms of the extent of PTSD and co-morbid psychiatric symptoms.

This study aimed to identify the latent classes of death anxiety, meaning in life and coping styles and to examine whether they have different levels of severity of PTSD and co-morbid psychiatric symptoms. Based on the aforementioned literature, it was hypothesised that victims of different classes would exhibit different levels of death anxiety and meaning in life. Some classes would use primarily approach coping rather than avoidance coping. The former classes would have lower levels of PTSD and psychiatric co-morbidity than the latter.

## **Methods**

### *Procedure*

One hundred and eighty-five Iraqi civilians exposed to a car bombing were recruited from the computerised medical records of the Ministry of Health and two hospitals in Ramadi and Fallujah. In these records, bombing was a separate category from other categories of illness. The University of Anbar gave ethical approval for the study. Clinicians and nurses assisted in the investigation by selecting victims from these records based on the following criteria: 1) Iraqi civilians, 2) first exposure to bombing, 3) 18 years of age or older, 4) literate and 5) the onset of bombing was approximately 1 month after the incident. Exclusion criteria were 1) psychiatric history, 2) cognitive impairment, 3) special needs and 4) no consent. The reason for using these exclusion criteria was that concurrent psychiatric disorders are 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 those without (Salazar et al., 2015). Including these individuals would therefore likely inflate the level of distress in the current study.

While the victims' psychiatric history and special needs status were examined using medical records with confirmation from clinicians, the research team administered a Mini Mental State Examination (MMSE) to each victim to determine if they were cognitively impaired. The MMSE is a reliable and valid screening test

for cognitive deficits or impairment (Guerrero-Berroa et al., 2009). Two hundred and thirty victims were initially identified from medical records and invited to participate in the study by telephone. Forty-five of them did not wish to participate, resulting in a final number of 185 victims. They were then invited to the Ministry of Health or Anbar University to complete a package of questionnaires (see the section [Measures](#)). Before completing the questionnaires, the objective of the study was explained to the victims. They were also assured of the anonymity and confidentiality of their answers. They had the right to withdraw from the study at any time and without giving any reason. The questionnaires were translated into Arabic by the second author and a professional interpreter. The back-translation was done by other interpreters who speak Arabic as their mother tongue and have a high level of proficiency in English. All items were then discussed, focussing on the items where discrepancies were found, and a common interpretation was agreed upon.

## Measures

*Demographic information* was collected on age, gender (1 = female, 2 = male), marital status (1 = single, 2 = married, 3 = divorced, 4 = widowed), education level (1 = up to primary school, 2 = secondary school, 3 = university) and how long ago the bombing occurred. Information on ethnicity, number of bombing experiences, literacy, psychiatric history, cognitive impairment and special needs status was obtained from medical records. The *Posttraumatic Stress Diagnostic Scale* (PDS) (Foa, 1995) was used to assess symptoms of posttraumatic stress disorder using DSM-IV criteria, with the car bomb being the index trauma. This scale included three subscales: intrusion, avoidance and hyperarousal. Victims rated the severity of symptoms using a rating scale: 0 = not at all, 1 = once a week or less/once in a while, 2 = two to four times a week/half the time and 3 = five or more times a week/almost always. A score of one or higher would be considered symptomatic. To meet the diagnostic criteria for PTSD, victims had to have at least one intrusion symptom, three avoidance symptoms and two hyperarousal symptoms. An assessment of the degree of impairment in functioning was also confirmed. The PDS has shown good reliability, 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, 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 a rating scale: 0 = not at all, 1 = no more than usual, 2 = rather more than usual and 3 = much more than usual. The scale includes four subscales: somatic problems, anxiety, social dysfunction and depression. The internal consistency of the scale using Cronbach's alpha was 0.91 and split-half was 0.88. In the present study, Cronbach's alpha for the total score was 0.91. The *Multidimensional Fear of Death Scale* (MFODS) (Hoelter, 1979) was used to measure victims' fear of death on a Likert scale: 1 = strongly agree and 5 = strongly disagree with a neutral mean. Low scores reflect greater fear of

death. The scale included eight subscales: fear of the dying process, of the dead, of destruction, of significant others, of the unknown, of conscious death, of the body after death and of premature death. Cronbach's  $\alpha$ -values for the scale ranged from 0.65 to 0.82 (Barr & Cacciatore, 2008). Based on the sample for the present study, Cronbach's alpha for the total score was 0.92.

*Meaning in Life Questionnaire* (MLQ) (Steger et al., 2006) was used to measure the extent to which victims searched for meaning in life and felt that their lives had meaning. The items in the questionnaire were scored on a scale of 1 (Absolutely True) to 7 (Absolutely Untrue). A higher score indicates a stronger search for meaning and the presence of meaning in life. The MLQ has shown good reliability and stability as well as robust structural validity. Cronbach's  $\alpha$  values for the MLQ-Presence and MLQ-Search subscales were 0.83 and 0.84, respectively. Based on the current sample, Cronbach's  $\alpha$  for the total score was 0.92. *Coping Responses Inventory* (CRI) (Moos, 1988) was used to assess the coping strategies that bombing victims used to manage the effects of the bombing experience. The CRI included two subscales: approach coping and avoidance coping on a 4-point rating scale (0 = not at all, 1 = once or twice, 2 = occasionally, 3 = quite often). These two coping subscales were composed of eight different coping strategies: logical analysis, positive evaluation, seeking support and problem solving for approach coping; and cognitive avoidance, acceptance, alternative rewards and emotional discharge for avoidance coping. Cronbach's  $\alpha$  for the eight CRI subscales ranged from 0.61 to 0.74. In the current study, Cronbach's  $\alpha$  for the total score was 0.70.

### **Data Analysis Plan**

Descriptive statistics were used to describe the demographic characteristics of the bombing victims. T-tests were used to compare diagnostic group differences in death anxiety, sense of meaning in life, coping styles, PTSD and psychiatric co-morbidity. Correlation coefficients, including point bi-serial correlations (rpb), were used to determine any associations between demographic variables and distress outcomes. Those variables associated with the outcomes were controlled in multivariate analysis of variance (MANOVA) to compare between classes in terms of the extent of PTSD and psychiatric co-morbidity. The reason for including the effect of demographic variables is that 'victim variables' have been associated with distress outcomes (Vogt et al., 2007).

Maximum likelihood estimation with robust standard errors and the assumption that the data are missing completely at random (Akaike, 1987) was used to explore the best-fitting class solution using LCA. The following indicators of model fit were used to determine the best-fitting class solution: lower Bayesian Information Criterion (BIC), sample-size adjusted Bayesian Information Criterion (SS-BIC) and Akaike Information Criterion (AIC) values, and the last significant Bootstrapped Likelihood Ratio Test (BLRT) to

calculate  $p$ -value, higher entropy values indicating the degree of classification accuracy and better fit compared to successive latent class models. The fit indicators, theoretical relevance, the principle of parsimony (a smaller number of classes is preferred) and the interpretability of the results in relation to our hypotheses (Nylund et al., 2007) were also considered. Less than 5% of the sample in a class solution would be rejected as this could be considered overfitting the data (Dziak et al., 2014).

Latent Gold 5.1 was used for the LCA analysis. The items on the questionnaires used in this study were dichotomised in the middle of the original Likert scales, with higher scores indicating higher levels of development. This categorisation process was adopted from the literature (Nylund-Gibson & Choi, 2018). LCA was conducted using a stepwise procedure to determine latent groups in the sample. Models between one and six classes that exhibited a certain pattern of conditional probabilities were examined. A MANOVA was then conducted to compare the levels of PTSD and psychiatric co-morbidity between the classes. Due to non-normality, the GHQ-28 total score was log-transformed. No outliers were found during exploration of the diagnoses (Mahalanobis  $\geq 3$  SD). After exploration and transformation, the assumptions of multivariate normality, linearity and homoscedasticity were met. There were no missing data in the current study.

## Results

One hundred and eighty-five Iraqi civilians (F = 94, M = 91) participated in the study. Wald tests for latent class modelling indicated that the sample size was considered sufficient for the present sample with a discriminatory power of 0.8. Based on the PDS diagnostic criteria, 82% and 18% met the criteria for PTSD and no-PTSD, respectively. There were no significant differences in age, gender, marital status, education level and time of onset of bombing (in months). The PTSD group reported significantly more co-morbid psychiatric symptoms and death anxiety than the no-PTSD group. The PTSD group reported significantly more avoidance coping but less approach coping than the no-PTSD group. The PTSD group perceived their lives as significantly less meaningful, but sought meaning in life significantly more than the no-PTSD group (see Table 1).

Table 2 shows the goodness-of-fit of the successive latent class models run on the whole sample. In other words, the individuals without PTSD were also included, which at first glance seems to have biased the sample. In fact, however, excluding these persons would probably have led to such a bias, since in this way persons with partial PTSD would have been excluded and only those with severe PTSD would have been included. PTSD occurs along a continuum of normal to abnormal stress responses. The diagnostic threshold aims only to exclude PTSD cases with less than average symptoms (Brewin, 2003). In other words, even if some people do not meet the diagnostic criteria for PTSD, their symptoms may still be distressing and require clinical intervention. Partial PTSD has been associated

with greater impairment in social functioning and physical and psychiatric comorbidity (e.g. Pietrzak et al., 2011).

Looking at the results of BIC, SS -BIC and AIC, there is a progressive improvement in model fit with high entropy values up to the fifth class. The gain from adding class 5 was marginal and the BLRT was not significant although the number of samples in class 5 was still above 5%, which is the smallest acceptable group size. Given that most criteria were met, we concluded that the four-class solution was optimal. Class 1 victims (26% approach copers with low levels of death anxiety and meaning) were those who had low levels of death anxiety and meaning in life and reported low levels of avoidance coping but high levels of approach coping. Class 2 victims (18% minimal copers with high levels of death anxiety and meaning) were those who had high levels of death anxiety and meaning in life but reported low levels of both coping styles. Class 3 victims (51% approach copers with high

**Table 1.** Diagnostic Group Differences in Demographic Details, Psychiatric Co-Morbidity, Death Anxiety, Coping Styles and Searching for Meaning.

	No-PTSD		PTSD		$\chi^2$	Cohen's <i>d</i>
	<i>N</i>	%	<i>N</i>	%		
F	17	52	77	51	0.008	—
M	16	48	75	49		
Single <sup>a</sup>	19	58	54	36	2.85	—
Married	14	42	89	59		
Primary <sup>b</sup>	6	18	47	31	1.83	—
Secondary	13	40	59	39		
University	14	42	46	30		
	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>t</i></b>	
Age	29.54	7.68	31.23	9.16	-0.98	0.20
Onset of bombing	5.72	2.51	5.01	2.24	1.61	0.30
Somatic problem	6.09	3.89	11.80	3.65	-8.05*	1.51
Anxiety	7.12	2.93	12.38	3.62	-7.78*	1.60
Social dysfunction	5.96	2.31	11.67	3.14	-9.84*	2.07
Depression	4.75	4.20	10.69	3.75	-8.04*	1.49
Death anxiety	115.03	30.83	151.35	20.74	8.28*	1.38
Approach coping	40.36	11.18	30.63	10.07	4.93*	0.91
Avoidance coping	36.72	9.24	41.93	6.75	-3.74*	0.64
Present meaning	20.18	1.89	9.05	1.42	38.23*	6.65
Search for meaning	10.24	3.09	24.24	2.45	-28.25*	5.02

<sup>a</sup>Dummy: single versus not single.

<sup>b</sup>Dummy: university versus not university education.

\**p* < 0.01.



**Table 2.** Goodness-of-Fit Statistics for Classes 1–6 Models and the Comparison of PTSD and Psychiatric Co-Morbidity Across Four Classes.

Model tested	Log-likelihood	BIC	SS-BIC	AIC	Entropy	BLRT	PTSD				Psychiatric co-morbidity			
							M	SD	F	$\eta_p^2$	M	SD	F	$\eta_p^2$
Class 1	-2673.05	5387.86	5362.52	5362.10	—	—	18.35	7.99	13.59*	0.18	31.83	15.56	19.33*	0.24
Class 2	-2594.88	5278.52	5224.67	5223.77	0.86	156.32*	24.66	4.98	—	—	50.09	8.37	—	—
Class 3	-2570.74	5277.21	5194.86	5193.48	0.69	48.28*	25.00	5.46	—	—	44.48	10.89	—	—
Class 4	-2554.12	5290.95	5180.10	5178.24	0.77	33.23*	24.40	4.19	—	—	50.40	12.53	—	—
Class 5	-2543.20	5316.11	5176.75	5174.41	0.72	21.82	—	—	—	—	—	—	—	—
Class 6	-2532.32	5341.32	5173.45	5170.64	0.76	21.77	—	—	—	—	—	—	—	—

Note. BIC = Bayesian information criterion; SS-BIC = sample-size adjusted BIC; AIC = Akaike information criterion.

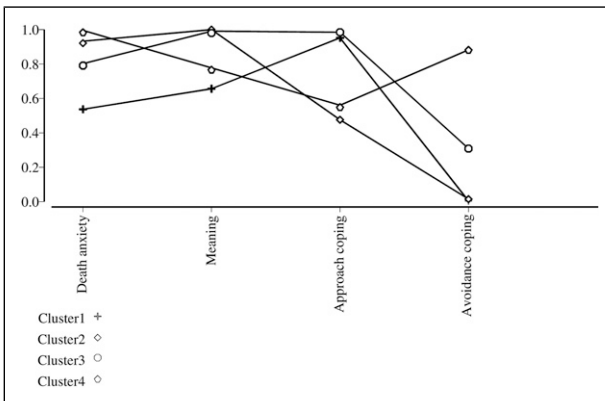
\* $p < 0.001$ .

death anxiety and meaning) were those who had high levels of death anxiety and meaning and reported high levels of approach coping but low levels of avoidance coping. Class 4 victims (5% avoidance copers with high levels of death anxiety) were those who had the highest levels of death anxiety and lower levels of meaning and reported lower levels of approach coping but the highest levels of avoidance coping (see Figure 1).

Before using MANOVA to compare the classes of PTSD and psychiatric co-morbidity, correlation coefficients were carried out to identify variables that were significantly correlated with the outcomes. If this was the case, they would be treated as covariates in the MANOVA. However, no significant correlations were found. There were significant differences between classes on both distress outcomes. Individuals in Class 1 reported significantly ( $p < 0.01$ ) lower scores for PTSD as well as co-morbid psychiatric symptoms than the other three classes. Class 3 victims also reported significantly ( $p < 0.05$ ) lower levels of psychiatric co-morbidity than Class 2 victims (see Table 2).

## Discussion

This study examined the latent classes of death anxiety, meaning in life and coping styles, and whether these classes would differ in severity of PTSD and psychiatric co-morbidity. The present findings supported the hypothesis that, regardless of differences in severity of death anxiety and sense of meaning in life, victims who used the approach coping strategy (Classes 1 and 3) tended to report lower distress outcomes than those who used minimal levels of coping (Class 2) and high levels of avoidance coping (Class 4).



**Figure 1.** Latent classes of victims based on death anxiety, meaning and coping responses.

Before discussing the results by class status, the results on the differences between the two diagnostic groups showed that compared to victims of no-PTSD, victims with PTSD suffered much more from death anxiety, general psychological distress, reported avoidance coping and found life less meaningful. Yet, they searched for meaning in life more than the no-PTSD group. In other words, although these PTSD individuals were psychologically vulnerable, they seemed to choose not to lose hope but to seek meaning in suffering and death (Frankl, 1988). Throughout contemporary history, the Iraqi people have lived through various wars, including the war that led to the fall of Saddam Hussein. The occupation by the United States of America triggered religious sectarian violence for Iraq and all its citizens. Between 2003 and 2010, heavy bombing and more than 1000 suicide bombings were documented with significant ‘collateral damage’ to civilians. Paradoxically, the principle of ‘psychological immunisation’ (Okasha & Elkholy, 2012) would suggest that this constant confrontation with conflict may have led to the development of resilience and coping with stressful events. The search for meaning could perhaps be a feature of this resilience.

Fear of death and meaning in life were positively correlated ( $r = 0.31, p < 0.001$ ). This observation is consistent with literature suggesting that heightened awareness of one’s mortality may increase motivation to search for meaning (Pyszczynski & Kesebir, 2011), which can be understood as a way of coping with stress (Halama, 2014; Miao et al., 2017) and situating the bombing experience within their existing cognitive schema (Park, 2013). Despite the bombing and the level of mortal fear and meanings, Class 1 victims reported significantly less distress than the other classes and could be considered resilient individuals. They showed signs of a ‘competent self’ (Brewin, 2003) and exhibited ‘agentic’ characteristics (Benight & Bandura, 2004). These characteristics enabled them to act as agents of change through intentional actions, which are the basic components of the coping style of approach. These victims possessed self-efficacious traits that enabled them to recover from or adapt to the trauma, solve problems and proactively regulate emotional distress.

Looking at item response probabilities, Class 1 victims prayed primarily for guidance or strength (92%). This result also mirrors one of our earlier studies that looked at religious coping based on the same sample (Freh & Cheung Chung, 2021). Further analysis of the data from that study found that Class 1 victims used significantly more religious coping than the other groups ( $F = 6.42, df = 3$  and  $p < 0.001$ ). The importance of religiosity and maintaining group harmony cannot be overstated in their culture. This has been shown to facilitate adaptive coping skills and emotion regulation strategies to maintain well-being (Ford et al., 2015), as well as reduce levels of PTSD and co-morbid psychiatric symptoms. For example, high levels of religiosity have been associated with lower risk of PTSD, depression and alcohol abuse in veterans

(Sharma et al., 2017). A sense of belonging to a religious community can promote resilience after trauma (Adedoyin et al., 2016). Religious coping has been shown to be a robust long-term predictor of quality of life for trauma victims (Laffey et al., 2020).

Similarly, social support is another approach coping strategy for Class 1 victims, who sought social support by talking to friends (88%) or spouses or other relatives (79%) as their approach coping strategy. In particular, further analysis showed that these victims made significantly more efforts to make new friends than the other groups ( $F = 18.16$ ,  $df = 3$ ,  $p < 0.001$ ). They were collectivists who would provide interdependence, connectedness with others, group harmony and fulfilment of social obligations (Jayawickreme et al., 2013). Social support has been conceptualised as a factor underlying resilience following trauma (Burton et al., 2015). Review studies have also confirmed the positive impact of social support or the negative impact of a lack of social support on the long-term psychological well-being of victims of different types (e.g. Alipour & Ahmadi, 2020; Liang et al., 2019).

Regarding the difference between Class 1 and Class 2 victims, the former reported significantly less distress than the latter. This result was not surprising, as Class 2 victims had apparently succumbed to the effects of the bombing and had adopted a fatalistic attitude. Looking at the item response probabilities of the Class 2 victims, they all (100%) tried to suppress the thought of the bombing. They accepted that there was nothing they could have done about their current situation (97%), that they had no control over the problem (91%) and that the outcome was determined by fate (91%). They believed that time would make a difference (79%). This coping behaviour could be described as fatalistic. That is, regardless of their intentions or actions in coping with the psychological consequences of the bombing, they felt that they could not have changed the consequences, as if they had been predetermined (Straughan & Seow, 1995). However, fatalism is a passive coping behaviour that is often associated with stressful outcomes (Espinosa de los Monteros & Gallo, 2011). Passivity and fatalism are likely to lead to a lower likelihood of seeking social support and expressing feelings. As mentioned earlier, the lack of social support would likely increase distress. Similarly, lack of emotional expression could also affect psychological well-being. Suppression of distressing emotions could lead to the accumulation of unresolved and unprocessed painful emotions that subsequently affect the physiological and neurological systems, leading to health or psychological difficulties (Pennebaker, 1995), including anxiety and depression (Amstadter & Vernon, 2008; Iwamitsu et al., 2005) and perpetuate the severity of PTSD symptoms due to past trauma (Clohessy & Ehlers, 1999).

When comparing Class 1 and Class 3 victims, Class 3 victims reported significantly higher levels of distress although they also adopted the coping style of approach. This result could reflect the effect of a psychological

burden. It has been argued that trauma can cause significant psychological burden for victims of different types (Ursano et al., 2012). This burden is associated with increased levels of distress, use of mental health services and a reduction in quality of life (Nichter et al., 2019). Class 3 victims experienced higher burden in the sense that they reported higher levels of fear of death and the need to search for meaning. This additional psychological burden may have exacerbated distress and reduced the effectiveness of the approach coping style in mitigating the effects of distress.

The present results also showed that Class 3 and Class 2 differed significantly only in terms of the degree of psychiatric co-morbidity. The former reported significantly fewer co-morbid psychiatric symptoms than the latter. This finding reflects research suggesting that while some psychological processes may have an impact on various disorders such as depression and anxiety, they are not necessarily uniquely related to PTSD symptoms (Brewin & Holmes, 2003). In other words, even when people share the diathesis for a particular psychological disorder, their experiences and manifestation of that disorder may vary due to individual differences or profiles (Barlow, 2002; Keane et al., 2007).

It is worth noting that Class 4 victims, who had the highest levels of fear of death and lower levels of meaning-making, and reported lower levels of approach coping but the highest levels of avoidance coping, reported high levels of PTSD and psychiatric co-morbidity, particularly compared to Class 1 victims. Further analysis also revealed a significant correlation ( $r = 0.69, p < 0.05$ ) between increased fear of death and avoidance coping, suggesting that when victims experienced increased fear of death, they also used an avoidance coping strategy. Since death is a given of our existence that develops across the lifespan, children learned at a young age to suppress death anxiety with the help of their parents (Yalom, 2008). A primary motivation for this defence was to protect oneself and promote optimal health by preventing thoughts of death from becoming fears of death (Strachan et al., 2007) and denying vulnerability or mortality (Abeyta et al., 2014). However, these Class 4 individuals appeared instead to exacerbate their psychological distress. This finding seems to echo the literature that threat to one's life can lead to maladaptive coping strategies in some individuals (Kastenbaum, 2006; Yalom, 2008). For this reason, it has been suggested that acceptance of death should be cultivated as part of the treatment of people with psychological disorders (Gesser et al., 1988).

The limitations of the study should be pointed out. First, the cross-sectional nature of the study meant that causal interpretations of the results were not possible. Second, the fact that no information was collected about previous traumas other than the bombing experience was an oversight for the current study. Research shows that PTSD due to prior trauma can act as a risk factor for PTSD in subsequent trauma (e.g. King et al., 1996). The extent to which

this dose-response was found to affect current trauma (e.g. Delahanty et al., 2003) and outcomes in the present study is unknown. Third, no data were collected on how culture might influence death anxiety, meaning and coping. The reason for not collecting this data was simply to avoid overloading participants with a large number of questionnaires. It has been suggested that in order to understand death anxiety in the Muslim population, it would be important to consider Islamic culture (Azadi et al., 2019). Meaning-making (Young & Morris, 2004) and coping styles may also differ between victims with individualistic and collectivistic cultural orientations (Gopalkrishnan & Babacan, 2015).

In conclusion, victims may suffer from posttraumatic stress and other psychological symptoms after a car bombing. The way victims responded to the distress could vary depending on their fear of death and their tendency to search for meaning, confront and cope with their distress. As for the implications that can be drawn from these findings, firstly, as long as the threat of car bombings persists in the country, the level of death anxiety affecting the PTSD responses of Iraqi victims of bombings will persist as such a threat is a constant reminder of their trauma. The government's inability to combat terrorism and ensure the safety of its citizens would only result in these distress reactions being hidden and perpetuated. The burden of mental health problems would deepen. Secondly, after a car bomb attack, psychological interventions should be implemented that focus on addressing the victims' death, promoting meaning in life and approach coping strategies. These interventions can be combined with commonly used therapeutic techniques (e.g. trauma-focused cognitive behavioural therapy). A future study should then investigate the effectiveness of this combined treatment approach.

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### **References**

- Abeyta, A. A., Juhl, J., & Routledge, C. (2014). Exploring the effects of self-esteem and mortality salience on proximal and distally measured death anxiety: A further

- test of the dual process model of terror management. *Motivation and Emotion*, 38(4), 523–528. <https://doi.org/10.1007/s11031-014-9400-y>
- Adedoyin, A. C., Bobbie, C., Griffin, M., Adedoyin, O. O., Ahmad, M., Nobles, C., & Neeland, K. (2016). Religious coping strategies among traumatized African refugees in the United States: A systematic review. *Social Work & Christianity*, 43(1), 95–107.
- Akaike, H. (1987). Factor analysis and AIC. *Psychometrika*, 52(3), 317–332. <https://doi.org/10.1007/bf02294359>
- Alipour, F., & Ahmadi, S. (2020). Social support and posttraumatic stress disorder (PTSD) in earthquake survivors: A systematic review. *Social Work in Mental Health*, 18(5), 501–514. <https://doi.org/10.1080/15332985.2020.1795045>
- Amstadter, A. B., & Vernon, L. L. (2008). A preliminary examination of thought suppression, emotion regulation, and coping in a trauma-exposed sample. *Journal of Aggression, Maltreatment & Trauma*, 17(3), 279–295. <https://doi.org/10.1080/10926770802403236>
- Azadi, M., Haratiyan, A. A., Fathi-Ashtiani, A., Janbozorgi, M., Pakdaman Shabestari, Z., & Abbas Zadeh, A. (2019). The development and validation of a Fear of Death Scale based on the cognitive approach of Avicenna. *Mental Health, Religion & Culture*, 22(6), 563–574. <https://doi.org/10.1080/13674676.2019.1637833>
- Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic*. Guildford Press.
- 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>
- Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy*, 42(10), 1129–1148. <https://doi.org/10.1016/j.brat.2003.08.008>
- Bowes, D. E., Tamlyn, D., & Butler, L. J. (2002). Women living with ovarian cancer: Dealing with an early death. *Health Care for Women International*, 23(2), 135–148. <https://doi.org/10.1080/073993302753429013>
- Brewin, C. R. (2003). *Posttraumatic stress disorder: Malady or myth?* Yale University Press.
- Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, 23(3), 339–376. [https://doi.org/10.1016/s0272-7358\(03\)00033-3](https://doi.org/10.1016/s0272-7358(03)00033-3)
- Burton, M. S., Cooper, A. A., Feeny, N. C., & Zoellner, L. A. (2015). The enhancement of natural resilience in trauma interventions. *Journal of Contemporary Psychotherapy*, 45(4), 193–204. <https://doi.org/10.1007/s10879-015-9302-7>
- Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, 61(1), 679–704. <https://doi.org/10.1146/annurev.psych.093008.100352>
- 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., & 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>
- Clohessy, S., & Ehlers, A. (1999). PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *British Journal of Clinical Psychology, 38*(3), 251–265. <https://doi.org/10.1348/014466599162836>
- Delahanty, D. L., Raimonde, A. J., Spoonster, E., & Cullado, M. (2003). Injury severity, prior trauma history, urinary cortisol levels, and acute PTSD in motor vehicle accident victims. *Journal of Anxiety Disorders, 17*(2), 149–164. [https://doi.org/10.1016/s0887-6185\(02\)00185-8](https://doi.org/10.1016/s0887-6185(02)00185-8)
- Doak, J., & Katsikitis, M. (2018). Terrorism catastrophization: An investigation of predicting and moderating factors. *Journal of Theoretical Social Psychology, 2*(1), 1–12. <https://doi.org/10.1002/jts5.13>
- 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>
- Dziak, J. J., Lanza, S. T., & Tan, X. (2014). Effect size, statistical power, and sample size requirements for the bootstrap likelihood ratio test in latent class analysis. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(4), 534–552. <https://doi.org/10.1080/10705511.2014.919819>
- Espinosa de los Monteros, K., & Gallo, L. C. (2011). The relevance of fatalism in the study of Latinas' cancer screening behavior: A systematic review of the literature. *International Journal of Behavioral Medicine, 18*(4), 310–318. <https://doi.org/10.1007/s12529-010-9119-4>
- Evrarn, G., & Çakici Eş, A. (2020). Investigation of personal factors affecting existential anxiety: A model testing study. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 39*(5), 1535–1542. <https://doi.org/10.1007/s12144-020-00947-2>
- Foa, E. B. (1995). The posttraumatic stress diagnostic scale. National Computer Systems.
- Ford, B. Q., Dmitrieva, J. O., Heller, D., Chentsova-Dutton, Y., Grossmann, I., Tamir, M., Uchida, Y., Koopmann-Holm, B., Floerke, V. A., Uhrig, M., Bokhan, T., & Mauss, I. B. (2015). Culture shapes whether the pursuit of happiness predicts higher or lower well-being. *Journal of Experimental Psychology: General, 144*(6), 1053–1062. <https://doi.org/10.1037/xge0000108>
- Frankl, V. E. (1988). *The will to meaning: Foundations and applications of logotherapy: expanded edition, with a new afterword by the author*. Meridian.
- Freh, F. M., & Cheung Chung, M. (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, 1-8*. <https://doi.org/10.1080/09638237.2021.1952954>
- 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>
- Gesser, G., Wong, P. T. P., & Reker, G. T. (1988). Death attitudes across the life-span: The development and validation of the Death Attitude Profile (DAP). *OMEGA-Journal of Death and Dying*, 18(2), 113–128. <https://doi.org/10.2190/0DQB-7Q1E-2BER-H6YC>
- Goldberg, D. P., & Hillier, V. F. (1979). A scaled version of the general health questionnaire. *Psychological Medicine*, 9(1), 139–145. <https://doi.org/10.1017/s0033291700021644>
- Gopalkrishnan, N., & Babacan, H. (2015). Cultural diversity and mental health. *Australasian Psychiatry*, 23(6 Suppl), 6–8. <https://doi.org/10.1177/1039856215609769>
- Guerrero-Berroa, E., Luo, X., Schmeidler, J., Rapp, M. A., Dahlman, K., Grossman, H. T., Haroutunian, V., & Beerli, M. S. (2009). The MMSE orientation for time domain is a strong predictor of subsequent cognitive decline in the elderly. *International Journal of Geriatric Psychiatry*, 24(12), 1429–1437. <https://doi.org/10.1002/gps.2282>
- Halama, P. (2014). Meaning in life and coping: Sense of meaning as a buffer against stress. In A. Batthyany & P. Russo-Netzer (Eds.) *Meaning in Positive and Existential Psychology* (pp. 239–250). Springer.
- Hamama-Raz, Y., Mahat-Shamir, M., Picho-Prelorentzos, S., Zaken, A., David, U. 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. <https://doi.org/10.1016/j.psychres.2016.08.059>
- Herr, D. J., & Buchanan, E. M. (2020). Generativity and other buffers of death awareness in first responders. *Anxiety, Stress & Coping: An International Journal*, 33(2), 193–206. <https://doi.org/10.1080/10615806.2019.1695522>
- 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. (2017). Death anxiety resilience; a mixed methods investigation. *Psychiatric Quarterly*, 88(3), 635–651. <https://doi.org/10.1007/s11126-016-9483-6>
- Hooker, S. A., Masters, K. S., & Park, C. L. (2018). A meaningful life is a healthy life: A conceptual model linking meaning and meaning salience to health. *Review of General Psychology*, 22(1), 11–24. <https://doi.org/10.1037/gpr0000115>
- Iwamitsu, Y., Shimoda, K., Abe, H., Tani, T., Okawa, M., & Buck, R. (2005). Anxiety, emotional suppression, and psychological distress before and after breast cancer diagnosis. *Psychosomatics*, 46(1), 19–24. <https://doi.org/10.1176/appi.psy.46.1.19>
- Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. Free Press.
- 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.
- Joseph, S. (2011). *What doesn't kill us: The new psychology of posttraumatic growth*. *What doesn't kill us: The new psychology of posttraumatic growth*. Basic Books.
- Kastenbaum, R. (2006). *The psychology of death* (3rd ed.). Springer Publishing Company.
- Keane, T. M., Brief, D. J., Pratt, E. M., & Miller, M. W. (2007). Assessment of PTSD and its comorbidities in adults. In M. J. Friedman, T. M. Keane, & P. A. Resick (Eds.), *Handbook of PTSD* (pp. 279–305). The Guilford Press.
- Kesebir, P., Luszczynska, A., Pyszczynski, T., & Benight, C. (2011). Posttraumatic stress disorder involves disrupted anxiety-buffer mechanisms. *Journal of Social and Clinical Psychology, 30*(8), 819–841. <https://doi.org/10.1521/jscp.2011.30.8.819>
- King, D. W., King, L. A., Foy, D. W., & Gudanowski, D. M. (1996). Prewar factors in combat-related posttraumatic stress disorder: Structural equation modeling with a national sample of female and male Vietnam veterans. *Journal of Consulting and Clinical Psychology, 64*(3), 520–531. <https://doi.org/10.1037//0022-006x.64.3.520>
- Kinney, A. R., Schmid, A. A., Henry, K. L., Coatsworth, J. D., & Eakman, A. M. (2019). Protective factors that mitigate the indirect risk of combat exposure upon meaning in life: A longitudinal study of student veterans. *Psychological Trauma: Theory, Research, Practice, and Policy*. Advance online publication. <https://doi.org/10.1037/tra0000512>
- Krok, D., Telka, E., & Zarzycka, B. (2019). Illness perception and affective symptoms in gastrointestinal cancer patients: A moderated mediation analysis of meaning in life and coping. *Psycho-Oncology, 28*(8), 1728–1734. <https://doi.org/10.1002/pon.5157>
- Laffey, M. E., Bjorck, J. P., & Currier, J. M. (2020). Coping and quality of life in veterans with chronic posttraumatic stress disorder. *Traumatology, 26*(2), 215–226. <https://doi.org/10.1037/trm0000222>
- Liang, Y., Cheng, J., Ruzek, J. I., & Liu, Z. (2019). Posttraumatic stress disorder following the 2008 Wenchuan earthquake: A 10-year systematic review among highly exposed populations in China. *Journal of Affective Disorders, 243*, 327–339. <https://doi.org/10.1016/j.jad.2018.09.047>
- Lo, C., Panday, T., Zepplier, J., Rydall, A., Murphy-Kane, P., Zimmermann, C., & Rodin, G. (2017). Preliminary psychometrics of the Existential Distress Scale in patients with advanced cancer. *European Journal of Cancer Care, 26*(6), 1–8. <https://doi.org/10.1111/ecc.12597>
- Lubke, G., & Muthen, B. O. (2007). Performance of factor mixture models as a function of model size, covariate effects, and class-specific parameters. *Structural Equation Modeling, 14*(1), 26–47. <https://doi.org/10.1080/10705510709336735>
- Malinauskaite, I., Slapikas, R., Courvoisier, D., Mach, F., & Gencer, B. (2017). The fear of dying and occurrence of posttraumatic stress symptoms after an acute

- coronary syndrome: A prospective observational study. *Journal of Health Psychology*, 22(2), 208–217. <https://doi.org/10.1177/1359105315600233>
- McHugh, R. K., & Weiss, R. D. (2019). Alcohol use disorder and depressive disorders. *Alcohol Research: Current Reviews*, 40(1), arcr.v40.1.01. <https://doi.org/10.35946/arcr.v40.1.01>
- Menzies, R. E., Sharpe, L., & Dar-Nimrod, I. (2019). The relationship between death anxiety and severity of mental illnesses. *British Journal of Clinical Psychology*, 58, 452–467. <https://doi.org/10.1111/bjc.12229>
- Miao, M., Zheng, L., & Gan, Y. (2017). Meaning in life promotes proactive coping via positive affect: A daily diary study. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 18(6), 1683–1696. <https://doi.org/10.1007/s10902-016-9791-4>
- Moos, R. H. (1988). Coping: Concepts and psychometric instruments. [German]. *Zeitschrift für Psychosomatische Medizin und Psychoanalyse*, 34(3), 207–225.
- Nichter, B., Norman, S., Haller, M., & Pietrzak, R. H. (2019). Psychological burden of PTSD, depression, and their comorbidity in the U.S. veteran population: Suicidality, functioning, and service utilization. *Journal of Affective Disorders*, 256, 633–640. <https://doi.org/10.1016/j.jad.2019.06.072>
- 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., Nixon, S. J., Shariat, S., Mallonee, S., McMillen, J., Spitznagel, E. L., & Smith, E. M. (1999). Psychiatric disorders among survivors of the Oklahoma City bombing. *JAMA: Journal of the American Medical Association*, 282(8), 755–762. <https://doi.org/10.1001/jama.282.8.755>
- 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>
- Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science*, 4(4), 440–461. <https://doi.org/10.1037/tps0000176>
- Nylund, K., Bellmore, A., Nishina, A., & Graham, S. (2007). Subtypes, severity, and structural stability of peer victimization: What does latent class analysis say? *Child Development*, 78(6), 1706–1722. <https://doi.org/10.1111/j.1467-8624.2007.01097.x>
- Okasha, T., & Elkholy, H. (2012). A synopsis of recent influential papers published in psychiatric journals (2010–2011) from the Arab world. *Asian Journal of Psychiatry*, 5(2), 175–178. <https://doi.org/10.1016/j.ajp.2012.05.001>
- Paez, D., Basabe, N., Ubillos, S., & Gonzalez-Castro, J. L. (2007). Social sharing, participation in demonstrations, emotional climate, and coping with collective

- violence after the March 11th Madrid bombings. *Journal of Social Issues*, 63(2), 323–337. <https://doi.org/10.1111/j.1540-4560.2007.00511.x>
- Park, C. L. (2013). Trauma and meaning making: Converging conceptualizations and emerging evidence. In J. A. Hicks & C. Routledge (Eds.), *The experience of meaning in life: Classical perspectives, emerging themes, and controversies* (pp. 61–76). Springer Science + Business Media.
- Park, C. L., Malone, M. R., Suresh, D. P., Bliss, D., & Rosen, R. I. (2008). Coping, meaning in life, and quality of life in congestive heart failure patients. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation*, 17(1), 21–26. <https://doi.org/10.1007/s11136-007-9279-0>
- Pennebaker, J. W. (1995). *Emotion, disclosure & health*. American Psychological Association.
- Pietrzak, R. H., Goldstein, R. B., Southwick, S. M., & Grant, B. F. (2011). Prevalence and axis I comorbidity of full and partial posttraumatic stress disorder in the United States: Results from wave 2 of the national epidemiologic survey on alcohol and related conditions. *Journal of Anxiety Disorders*, 25(3), 456–465. <https://doi.org/10.1016/j.janxdis.2010.11.010>
- 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>
- Routledge, C., & Juhl, J. (2010). When death thoughts lead to death fears: Mortality salience increases death anxiety for individuals who lack meaning in life. *Cognition & Emotion*, 24(5), 848–854. <https://doi.org/10.1080/02699930902847144>
- 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. <https://doi.org/10.1037/ser0000391>
- Safren, S. A., Gershuny, B. S., & Hendriksen, E. (2003). Symptoms of posttraumatic stress and death anxiety in persons with HIV and medication adherence difficulties. *AIDS Patient Care and STDs*, 17(12), 657–664. <https://doi.org/10.1089/108729103771928717>
- 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>
- Schnoll, R. A., Knowles, J. C., & Harlow, L. (2002). Correlates of adjustment among cancer survivors. *Journal of Psychosocial Oncology*, 20(1), 37–60. [https://doi.org/10.1300/j077v20n01\\_03](https://doi.org/10.1300/j077v20n01_03)
- Schuster, M. A., Stein, B. D., Jaycox, L. H., Collins, R. L., Marshall, G. N., Elliott, M. N., Zhou, A. J., Kanouse, D. E., Morrison, J. L., & Berry, S. H. (2001). A national survey of stress reactions after the September 11, 2001, terrorist attacks.

- New England Journal of Medicine*, 345(20), 1507–1512. <https://doi.org/10.1056/NEJM200111153452024>
- Shahar, G., Cohen, G., Grogan, K. E., Barile, J. P., & Henrich, C. C. (2009). Terrorism-related perceived stress, adolescent depression, and social support from friends. *Pediatrics*, 124(2), e235–e240. <https://doi.org/10.1542/peds.2008-2971>
- Sharma, V., Marin, D. B., Koenig, H. K., Feder, A., Iacoviello, B. M., Southwick, S. M., & Pietrzak, R. H. (2017). Religion, spirituality, and mental health of U.S. Military veterans: Results from the National Health and Resilience in Veterans Study. *Journal of Affective Disorders*, 217, 197–204. <https://doi.org/10.1016/j.jad.2017.03.071>
- 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>
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, 53(1), 80–93. <https://doi.org/10.1037/0022-0167.53.1.80>
- Strachan, E., Schimel, J., Arndt, J., Williams, T., Solomon, S., Pyszczynski, T., & Greenberg, J. (2007). Terror mismanagement: Evidence that mortality salience exacerbates phobic and compulsive behaviors. *Personality & Social Psychology Bulletin*, 33(8), 1137–1151. <https://doi.org/10.1177/0146167207303018>
- Straughan, P. T., & Seow, A. (1995). Barriers to mammography among Chinese women in Singapore: A focus group approach. *Health Education Research*, 10(4), 431–441. <https://doi.org/10.1093/her/10.4.431>
- 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>
- Updegraff, J. A., Silver, R. C., & Holman, E. A. (2008). Searching for and finding meaning in collective trauma: Results from a national longitudinal study of the 9/11 terrorist attacks. *Journal of Personality and Social Psychology*, 95(3), 709–722. <https://doi.org/10.1037/0022-3514.95.3.709>
- Ursano, R. J., Fullerton, C. S., & Benedek, D. M. (2012). What is psychopathology after disasters? Considerations about the nature of the psychological and behavioral consequences of disasters. In Y. Neria, S. Galea, & F. H. Norris (Eds.), *Mental health and disasters* (pp. 131–142). Cambridge University Press.
- 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). Guildford.
- Weathers, L. N., Aiena, B. J., Blackwell, M. A., & Schulenberg, S. E. (2016). The significance of meaning to conceptualizations of resilience and posttraumatic growth: Strengthening the foundation for research and practice. In P. Russo-Netzer, S. E. Schulenberg, & A. Batthyany (Eds.), *Clinical perspectives on*

- meaning: Positive and existential psychotherapy* (pp. 149–169). Springer International Publishing.
- Yalom, I. D. (2008). *Staring at the sun: Overcoming the terror of death*. (Vol. viii, pp. 306). Jossey-Bass.
- Young, M. J., & Morris, M. W. (2004). Existential meanings and cultural models: The interplay of personal and supernatural agency in American and Hindu ways of responding to uncertainty. In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of Experimental Existential Psychology* (pp. 215–230). Guilford Press.
- 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>

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