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## Exploring the mental health correlates of overdose loss

Jamison S. Bottomley<sup>1,2</sup>, William T. Feigelman<sup>3</sup>, Alyssa A. Rheingold<sup>1</sup>

<sup>1</sup>Department of Psychiatry and Behavioral Sciences, National Crime Victims Research and Treatment Center, Medical University of South Carolina, Charleston, South Carolina, USA

<sup>2</sup>Department of Psychology, The University of Memphis, Memphis, Tennessee, USA

<sup>3</sup>Department of Sociology, Nassau Community College, Garden City, New York, USA

### Abstract

Despite the exorbitant rise in overdose-related deaths, little is known about the mental health burden associated with this form of loss. Using validated self-report instruments, the present study investigated the prevalence of pathological symptoms of prolonged grief disorder (PGD), posttraumatic stress disorder (PTSD), major depressive disorder (MDD) and generalized anxiety disorder (GAD), and suicide risk among a sample of overdose loss survivors ( $n = 115$ ). Comparison groups consisting of other sudden loss survivors (suicide and sudden-natural loss) were employed to illuminate any shared or unique mental health challenges. Consistent with this study's primary hypothesis, results indicated that the overall mental health burden of overdose loss is substantial. Specifically, after controlling for a number of covariates, overdose loss survivors were approximately three times more likely to meet the symptom severity threshold for PGD, PTSD, and MDD compared to sudden-natural loss survivors. Overdose loss survivors also appeared to be at risk for GAD symptoms and suicide, but differences were non-significant after accounting for a number of covariates. Overall, this study is the first to examine this particular constellation of mental health outcomes associated with overdose bereavement, underscoring the need for additional empirical and clinical attention placed on this burgeoning population.

### Keywords

overdose loss; prolonged grief disorder; PTSD; sudden loss; suicide loss; suicide risk

## 1 | INTRODUCTION

The loss of a loved one through death is a common and universal experience, with the majority of mourners adapting to the death without complication or impairment (Stroebe et al., 2007). However, when death is unexpected and, thus, potentially traumatic, the course of bereavement is often more arduous and may be compounded by mental health and grief-related pathology (e.g., posttraumatic stress disorder [PTSD], prolonged grief disorder [PGD], suicide risk; e.g., Boelen, 2015; Lobb et al., 2010; Van Ameringen et al., 2008). One form of sudden and potentially traumatic loss that has recently captured the public's

consciousness, particularly in the United States, are deaths due to drug-related overdose. In 2019, the CDC estimated that 70,980 deaths in the United States were caused by drug overdose, 70.5% (50,042) of which were directly linked to an opioid (e.g., synthetic opioids such as fentanyl and tramadol, prescribed opioids, and heroin; Centers for Disease Control and Prevention; CDC, 2021). The rate of opioid overdose deaths has been increasing at an alarming rate over the last decade. For example, the rate of opioid-related overdose deaths in 2017 was six times greater than the opioid overdose death rate in 1999, and the United States saw a 9.6% increase in opioid overdose deaths between 2016 and 2017 alone (Scholl et al., 2018). Furthermore, the confluence of a number of stressors associated with the COVID-19 pandemic have dramatically exacerbated overdose rates, with over 81,000 reported overdose deaths in the United States between May 2019 and May 2020, the highest prevalence ever recorded in a 12-month period (CDC, 2021), leading many experts to believe the rate may further increase (Slavova et al., 2020). With the substantial rise in opioid-overdose deaths in the past decade, and during the COVID-19 pandemic in particular, overdose deaths have been recognized as a public health crisis that has unsurprisingly warranted the attention of stakeholders and officials nationwide (e.g., Seth et al., 2018). Although confronting the task of reducing such deaths is necessary, little attention has been paid to the vast number of individuals who are left in the wake of opioid-related overdose deaths. With recent population data suggesting that individuals who experience the fatal overdose of a loved one are at risk for their own death due to natural and unnatural causes (Christiansen et al., 2020), understanding the deleterious mental health outcomes that are associated with this form of sudden loss is of great importance.

Although it is reasonable to assume that a large number of people are bereaved by an opioid-related loss given the frequency of such deaths in recent years, population-based estimates regarding the number of people confronted with and possibly profoundly affected by opioid-related deaths are nonexistent. Nevertheless, data from Norway suggest that for every one opioid or drug-related overdose death, there are at least 10 next-of-kin who are left in the aftermath of the death and are likely to suffer the effects of a painful and debilitating grief response, causing impairment in myriad domains (Dyregrov et al., 2019). Utilizing this estimate as a proxy for the number individuals impacted by the overdose death of a close other reveals that a substantial number of survivors of opioid-related death may exist in the US population. Given the enormity of the overdose epidemic and the likely exacerbation of rates and additional burdens instigated by the current COVID-19 pandemic, examining grief and mental health-related pathology among individuals who have lost a loved one or close other to a fatal overdose can further illuminate the scope of the problem.

### 1.1 | The phenomenology of opioid-related loss

Despite the rapid growth of opioid-related deaths, knowledge about possible mental health complications secondary to this type of loss is limited. In fact, a recent systematic review of the literature revealed that only eight studies had investigated the challenges inherent in overdose loss (Titlestad et al., 2019), though a small number of studies have been conducted since then. Furthermore, the current literature on opioid- and drug-related loss typically includes experiences of those who had lost a significant other to alcohol misuse or accidents occurring in the context of drug use (e.g., Titlestad et al., 2021), limiting our understanding

of the experience specific to overdose loss. Nevertheless, these studies provide preliminary insight into the inherent suffering many overdose loss survivors experience in the wake of loss. For example, qualitative research has indicated that survivors of an overdose loss often contend with loss-related guilt following perceptions of failing to intervene, either in the months and years leading up to the death, or in the acute aftermath of an overdose (Guy, 2004). In addition, stigma, whether actual or perceived, and an enduring search for *why* or *how* the death occurred are factors that appear common among individuals confronted with the overdose death of a close other (e.g., Templeton et al., 2016).

Beyond the difficult grief-related themes experienced by many overdose loss survivors that suggest possible elevated prolonged grief symptomatology in this population, many overdose deaths are potentially traumatic (Feigelman et al., 2018; Ford et al., 2017) and may yield pathological levels of posttraumatic stress among surviving loved ones. For example, many survivors of opioid-related loss who discovered the body, particularly parents of overdose victims, reported the experience to be extremely traumatic, in some cases exacerbated by unsuccessful efforts to resuscitate the decedent (Templeton et al., 2016). In other cases, graphic details of the scene, including pictures or descriptions, may be shared with the bereft, providing an additional avenue for potential traumatization (Templeton et al., 2016). However, although it seems reasonable to speculate that overdose loss survivors may contend with elevated levels of prolonged grief or traumatic stress as a result of the nature of the loss and its related qualitative themes, limited attention has been placed on the prevalence of mental health and grief-related pathology among individuals confronted with the opioid-related overdose death of a close other.

To-date, only two studies have examined mental health (e.g., PTSD) and grief-related outcomes (e.g., PGD) among overdose loss survivors. Feigelman et al. (2011) compared the severity of PGD and PTSD symptoms of 48 parents grieving the overdose death of a child to parents bereaved following other causes. Results indicated that overdose loss survivors experienced high levels of PGD and PTSD, and in a manner that was not significantly different than survivors of suicide loss. However, when symptom severity among overdose loss survivors was compared with survivors of a child's accident or natural death, significant differences emerged. Even after adjusting for time elapsed since the death and identified gender of the respondent, overdose loss survivors reported greater levels of PGD and PTSD symptomatology compared to parents bereaved by an accident or sudden-natural death of a child. More recently, citing the dearth of research on overdose loss, Titlestad et al. (2021) attempted to identify the prevalence and predictors of prolonged grief symptomatology and also found high levels of grief-related psychopathology across their sample of 93 parents bereaved following a drug-related death. Although these are the only studies that directly examine mental health correlates of overdose loss, these investigations were limited by a relatively small sample size, included drug-related deaths (e.g., deaths due to accident or infectious disease secondary to drug use), or failed to capture other forms of psychopathology (e.g., mood-related symptoms and suicide risk) to provide a more accurate scope of the problem. Although not a direct examination of overdose loss survivorship, Bottomley et al. (2021) examined patterns of bereavement-related needs and their associated outcomes among a sample of sudden loss survivors (i.e., overdose, suicide, and sudden natural losses). Four homogenous groups of individuals were identified based

on the importance of needs with individuals reporting the highest degree of needs being predominately comprised of overdose and suicide loss survivors. Similar to Feigelman et al.'s (2011) and Titlestad et al.'s (2021) findings, results indicated elevated PGD and PTSD among individuals who contend with overdose loss, based on the composition of the needs classes. In addition, individuals in the high needs class reported markedly high levels of depression, anxiety, and suicide risk, even after accounting for a number of covariates. Taking these findings into account, it appears that the experience of overdose loss may yield vulnerabilities to adverse mental health consequences in a manner that is similar to suicide loss survivors. Furthermore, many of the aforementioned qualitative themes experienced by overdose loss survivors (e.g., guilt, stigma, and a search for *why*) have been shown to be associated with prolonged grief in other grieving populations, and are particularly pronounced among individuals bereaved by suicide (Jordan, 2001). As such, suicide loss and other sudden forms of bereavement may be both a temporary proxy and subsequent comparison group for identifying mental health sequelae affiliated with overdose loss bereavement.

## 1.2 | Proxies for the mental health consequences of overdose loss

Despite little knowledge about the specific mental health challenges associated with overdose loss, particularly suicide risk, a number of factors, such as the unexpected or potentially traumatic nature of the loss, may serve as proxies for understanding possible psychiatric outcomes. For example, broad consensus has been reached that suggests psychiatric morbidity is exacerbated when the death of a loved one or close other is violent or sudden (e.g., Kristensen et al., 2012). While it has been estimated that 10%–15% of bereft individuals will meet criteria for PGD following the death of a close other due to natural causes (e.g., Prigerson, 2004), far higher rates of PGD diagnoses have been found among individuals who lose a loved one or close other to sudden or potentially traumatic causes (Lobb et al., 2010). Furthermore, although studies have found that bereavement following expected and natural causes of death can generate traumatic stress reactions (Zisook et al., 1998), population-based studies have found that unexpected or violent loss may represent a unique risk factor for PTSD (Rheingold et al., 2012; Van Ameringen et al., 2008; Zinzow et al., 2009). More specifically, suicide loss, a cause of death that is often violent and shares volitional qualities with fatal overdose, has consistently been referred to as one that yields a riskier prognosis compared to other forms of loss due to a number of poor outcomes (e.g., Pitman et al., 2014). For example, research has found that those bereaved due to suicide may be at risk for a variety of psychological, social, and bereavement complications, such as elevated rates of PGD (Mitchell et al., 2005) and PTSD (e.g., Cerel et al., 2017; Zisook et al., 1998) and suicide. For instance, when compared to individuals who have lost a loved one of a similar relationship category due to causes other than suicide, suicide survivors who lost a partner were at higher risk for completing suicide themselves (Agerbo, 2005). Further, in a sample of nuclear families who had lost children to suicide, it was found that mothers were at higher risk for suicide than mothers bereaved by other causes (Qin et al., 2003). In a study of treatment seeking adults, Tal et al. (2017) found evidence suggesting that individuals who lost a close other to suicide experienced greater levels of suicidal ideation and behaviour, though distinctions in mental health outcomes were more ambiguous compared to other loss groups.

Furthermore, individuals who have lived with close others with problematic drug use are often subjected to protracted stress, such as worrying about their loved one's well-being and future (Orford et al., 2013), and therefore may have pre-existing elevations in mood-related symptomatology or suicidality (Leventhal et al., 2011). Indeed, in a broad sense, informal caregivers of individuals with psychiatric conditions have been shown to experience high levels of stress, low levels of self-efficacy, poor physical health, substance misuse, and depression (Treasure, 2004). Such pre-existing mental health challenges may serve as additional vulnerability factors among overdose loss survivors as research consistently illustrates that individuals with pre-trauma psychiatric conditions are at increased risk for additional mental health complications post-trauma (Sullivan et al., 2013). Accordingly, overdose loss survivors may experience profound mental health consequences as a result of a compounding of the loss by pre-existing levels of stress and mental health conditions that are associated with being in proximity to, or entanglement with, the decedent's problematic substance use prior to their death. In fact, qualitative research highlights how many survivors experience a 'double death' in which individuals mourn the loss of their close other to chronic drug use, followed by their biological death at a later time (Valentine et al., 2016).

Another proxy for the deleterious mental health consequences of overdose loss can be speculated based upon levels of stigma, guilt, shame, and a protracted search for why the death occurred (e.g., Feigelman et al., 2018; Titlestad et al., 2020). For instance, research with suicide loss survivors suggests that adverse mental health outcomes may be the product of, among other factors, these thematic grief challenges (Hanschmidt et al., 2016). The suicide bereaved frequently engage in an intense and protracted search for the reason for the death (Currier et al., 2006), cope with a distorted sense of responsibility, with subsequent guilt and shame (Bailey et al., 1999), and are subject to societal stigma (Kølves et al., 2020), both perceived and actual. As such, the experience of suicide and overdose loss appear similarly fraught with such grief-related themes, signifying a potentially similar grief experience that yields similar levels of mental health and grief-related pathology. Moreover, given that sudden loss survivors are at elevated risk for deleterious mental health outcomes, particularly when the loss was violent or volitional, it stands to reason that individuals who experience the overdose death of a loved one may be similarly vulnerable. However, as underscored throughout, the literature on overdose bereavement is limited, making an exploration of psychiatric morbidity among this population critical, particularly given their increased risk for mortality (Christiansen et al., 2020). Identifying the prevalence of pathological levels of psychiatric symptomatology among this understudied, yet burgeoning, population is crucial in order more fully characterize the challenge associated with overdose loss in an effort to marshal warranted clinical resources. Seeking to extend knowledge generated by earlier studies that explored the burden of overdose loss, the current study examines pathological symptoms of PGD, PTSD, and for the first time, mood-related disorders and suicide risk, among individuals confronted with the overdose death of a close other. Moreover, acknowledging the overlap between overdose and suicide loss, comparison groups consisting of suicide and sudden-natural loss survivors were employed to further illuminate any shared or unique mental health challenges. Consistent with the extant literature on overdose bereavement, we hypothesized that a substantial proportion of survivors of overdose loss will meet or exceed the symptom severity threshold that reflects a

positive screen for PGD and PTSD, in a manner that is similar to suicide loss survivors given the shared grief-related themes and outcomes reported elsewhere (e.g., Feigelman et al., 2011; Titlestad et al., 2020). Furthermore, we suspect the presence of elevated symptoms of Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), and prevalence of suicide risk among overdose loss survivors based on levels of stigma, guilt, and shame, as well as pre-existing mental health difficulties often experienced in this loss group.

## 2 | METHODOLOGY

### 2.1 | Participants and procedures

Sample characteristics and descriptive statistics are included in Table 1. The current sample included 403 adults, aged 18–79 ( $M_{age} = 42.31$  years,  $SD = 17.17$ ) who had lost a loved one or close other due to opioid overdose ( $n = 115$ ), suicide ( $n = 185$ ), and sudden-natural causes (e.g., acute myocardial infarction;  $n = 103$ ). The decedent represented a broad range of kinship categories, but the majority of participants lost a child ( $n = 154$ ; 38.2%), sibling ( $n = 63$ ; 15.6%), parent ( $n = 38$ ; 9.4%), or grandparent ( $n = 38$ ; 9.4%), with the remaining participants experiencing the death of a distant family member (e.g., cousin, aunt/uncle;  $n = 32$ ; 7.9%), spouse/partner ( $n = 36$ ; 8.9%), or friend ( $n = 28$ ; 6.9%). A small proportion of other relationships (e.g., coworkers;  $n = 14$ ; 3.5%) were also represented in the sample. Time since the loss (TSL) varied, with a range between two months and 5 years ( $M_{TSL} = 25.12$  months,  $SD = 18.09$  months). The vast majority of participants identified as female ( $n = 338$ ; 83.9%) and white ( $n = 301$ ; 74.9%). Greater than a quarter of participants represented ethnic minority populations, with 49 participants identifying as African American/Black (12.2%), 25 as Hispanic/Latino (6.2%), 22 as Asian (5.5%), and 5 as Native American (1.2%). Regarding socioeconomic indicators, nearly half had completed a college degree ( $n = 195$ ; 48.4%), and a substantial proportion completed some college ( $n = 142$ ; 35.2%), while all others obtained a high school degree ( $n = 68$ ; 16.4%). Yearly household income varied, with 10.9% reporting a household income below \$10,000 ( $n = 43$ ), 28.8% between \$10,000 and \$50,000 ( $n = 114$ ), 34.8% between \$50,000 and \$100,000 ( $n = 138$ ), and 25.5% above \$100,000 ( $n = 101$ ). Seven participants did not report their yearly household income.

Data collection occurred via online surveys using Qualtrics, a secure survey system that meets established standards for Internet security, research, and IRB policy ('Qualtrics Security Statement', 2016). Upon IRB approval, participants who were least 18 years of age and experienced the death of a loved one or close other due to sudden causes within the previous 5 years—a timeframe widely employed in bereavement research—were recruited using various strategies. Recruitment of overdose and suicide loss survivors occurred through the dissemination of virtual flyers to numerous social media groups (e.g., Parents of Suicide Loss; Grief Recovery After a Substance Passing), word-of-mouth referrals, American Foundation for Suicide Prevention newsletter advertisements, and notifications of the study on the American Association of Suicidology survivor listserv. Added emphasis was placed on the social media outlets in order to attract a substantial number of participants who were not already engaged in services offered by numerous support organizations. Recruitment of individuals bereaved following the sudden but natural death of a close other occurred through online social media posts targeting general loss support organizations. In



addition, undergraduate students from a large university located in the Mid-South region of the United States who had endorsed experiencing the sudden but natural death of a close other within the past 5 years were recruited through an online subject pool system that exchanges course credit for research participation. All prospective participants were directed to a central study website ([stlproject.org](http://stlproject.org)) that contained information regarding the nature of the study, the personnel, and the study's likely contribution to the literature. Participants were offered a modest monetary incentive (\$5 Amazon eGift Card or a donation made to an organization/charity of their choice) for survey completion.

## 2.2 | Measures

**2.2.1 | Demographic, relational, and loss variables**—Select demographic variables were obtained, including sex, age, ethnicity, kinship category of the decedent, TSL, and the respondent's interpretation of the cause of death. When the cause of death was listed as 'ambiguous' ( $n = 2$ ), the method of the death drove the determination of the cause of death (i.e., poisoning by ingestion of illicit drugs was considered an overdose death). In addition, given the fact that a proportion of participants were recruited during the COVID-19 pandemic and completed the study assessments during this time (see Table 1), which may have influenced the results, participants were identified as either completing the survey instrument prior to or during the current pandemic. Furthermore, in an effort to account for pre-existing mental health factors that might compound psychiatric symptoms subsequent to the death of a loved one, respondents were asked to indicate any mental health diagnoses they received prior to the death, which were then summed to create a composite score. Pre-death levels of closeness with the decedent were assessed using the Quality of Relationships Inventory—Bereavement Version (QRI-B; Bottomley et al., 2017), a 13-item self-report measure that assesses closeness and conflict between the mourner and deceased prior to the death. The Closeness scale was utilized for the purpose of the current study, and items on this scale assess the degree to which the relationship was supportive and intimate prior to the death (e.g., '*To what extent could you count on this person to help you if a family member very close to you died?*'). Items are rated on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*very much*). The QRI-B has demonstrated high internal consistency across both subscales (Closeness  $\alpha = 0.95$ ; Conflict  $\alpha = 0.88$ ), and evidenced strong validity in its relation to outcomes in previous studies (e.g., Bottomley et al., 2017). In the current study, the Closeness factor of the QRI-B demonstrated high internal consistency,  $\alpha = 0.88$ .

**2.2.2 | Prolonged grief**—The Inventory of Complicated Grief (ICG; Prigerson et al., 1995) consists of 19 items that measure severity of PGD symptoms, such as yearning or longing for the deceased, numbness, meaninglessness, mistrust, difficulty with acceptance, and identity confusion. Items of the ICG are rated on a five-point Likert-type scale that primarily assesses frequency (1 = never to 5 = always). Strong psychometric properties of the ICG have been demonstrated in a number of studies, including support for the instrument's validity in determining a likely PGD diagnosis (e.g., Barry et al., 2002) using a cut-off of 25 to indicate optimum symptom severity (Prigerson et al., 1995), and predicts of a range of adverse physical and mental health correlates of bereavement (Latham & Prigerson, 2004). Additionally, high internal consistency ( $\alpha = 0.95$ ) has been reported for

the ICG in samples of both normative and traumatic loss (Keesee et al., 2008). The ICG demonstrated excellent internal consistency in the current sample,  $\alpha = 0.91$ .

**2.2.3 | Posttraumatic stress disorder**—The PTSD Checklist for DSM-5 (Blevins et al., 2015) is a 20-item self-report measure of past-month PTSD symptom criteria. All 20 items correspond with the DSM-5 symptoms and their corresponding clusters. Sample items include, ‘In the past month, how much were you bothered by: “repeated disturbing dreams of the stressful experience” and “feeling jumpy or easily startled”’. Respondents were asked to respond to items with the sudden death of a close other as the index event. Items are summed, and rated on a scale from (0) *Not at all* to (4) *Extremely* (range 0–80), with composite scores of 33 or above indicating clinically relevant PTSD symptom severity and a positive screen for a PTSD diagnosis. In the current sample,  $\alpha = 0.93$ .

**2.2.4 | Depression and anxiety**—The Patient Health Questionnaire-8 (PHQ-8; Kroenke et al., 2009) is an eight-item self-report measure of depressive symptomatology per the DSM-IV (e.g., ‘Over the past 2 weeks, how often have you been bothered by: “little interest or pleasure in doing things” and “Poor appetite or overeating”’). Items are rated on a scale from (0) *Not at all* to (3) *Nearly every day* (range 0–24). Items were summed to produce a total score. Scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe and severe depression, respectively. For the current study, the recommended cut-off of 10 was utilized to determine clinically significant symptoms of MDD (Shin et al., 2019). The PHQ-8 has demonstrated adequate internal consistency ( $\alpha = 0.88$ ), test-retest reliability, and convergent and divergent validity (Kroenke et al., 2009). To assess anxiety symptomatology, the GAD seven-item scale (GAD-7; Spitzer et al., 2006) was included in the survey battery. The GAD-7 assesses how often participants experienced anxiety symptoms over the previous two weeks (e.g., ‘Over the past 2 weeks, how often have you been bothered by: “feeling nervous, anxious, or on edge” or “trouble relaxing”’). Items are rated on a scale from (0) *Not at all* to (3) *Nearly every day* (range 0–21) and summed to produce a total severity score. Based on recommendations by Spitzer et al. (2006), a cut-off of 10 was utilized to identify those who met the threshold for a positive screen for GAD. Like the PHQ-8, the GAD-7 has demonstrated strong psychometric properties, including internal consistency ( $\alpha = 0.89$ ), test-retest reliability, and convergent and divergent validity (e.g., Löwe et al., 2008) in previous studies. Both the PHQ-8 and GAD-7 had strong alpha coefficients within the current sample, with  $\alpha = 0.90$  and  $0.91$  for the PHQ-8 and GAD-7, respectively.

**2.2.5 | Suicide risk**—Suicide risk was assessed using the four-item Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001), a brief self-report instrument that accounts for previous suicide attempts, frequency of suicidal ideation, suicidal communication, and the subjective likelihood of a future suicide attempt. Construct validity for the SBQ-R is strong based on its ability to reliably differentiate between suicidal and non-suicidal subgroups in both clinical and nonclinical contexts. Total scores for the SBQ-R range from 3 to 18, with a cut-off of 7 or higher being indicative of elevated suicide risk (Osman et al., 2001). Previous studies have found this instrument to be highly internally



consistent ( $\alpha = 0.94$ ; Nadorff et al., 2013). In this study, internal consistency was moderately high ( $\alpha = 0.84$ ).

### 2.3 | Analytic plan

All analyses were conducted using the statistical package for the social sciences (SPSS) version 25 (SPSS Inc.). Upon inspection, a total of three respondents had missing values on a select number of outcome measures. Missing values were replaced with the respondent's mean value for other items in the outcome scale as fewer than 25% of the values were missing for these cases (e.g., Unterhitzberger et al., 2020). Categorical variables (mode of loss; pre-death psychiatric diagnoses) were first investigated using the chi-square test of independence, followed by the prevalence of mental health outcomes among loss groups. The prevalence of clinically elevated psychiatric symptomatology (i.e., PGD, PTSD, MDD, GAD) as well as elevated suicide risk were determined using cut-off scores specified above. Next, in order to examine the association between overdose loss and psychiatric symptomatology while accounting for numerous demographic and loss covariates, a series of logistic regression analyses were conducted, with symptom severity thresholds for PGD, PTSD, MDD, GAD, and suicide risk as the dependent variables. Covariates to be accounted for in the logistic regression models were determined by examining the relationship between numerous established confounds (e.g., time since loss, pre-death closeness, gender, age, pre-death mental health diagnoses of the respondent, possible effects of the COVID-19 pandemic) and outcome variables using Pearson and point-biserial (for examining relationship between dichotomous variables and outcomes) correlations; see Table 2. Despite the moderately strong correlation coefficients between select covariates, multi-collinearity diagnostics revealed acceptable tolerance (Tol = 0.58–0.97) and variance inflation factor values (VIF = 1.04–1.73) based on widely accepted recommendations (Midi et al., 2010).

## 3 | RESULTS

Table 3 reports prevalence of scores that exceeded the symptom severity threshold for PGD, PTSD, mood-related disorders, and suicide risk between the different modes of loss (overdose, suicide, and natural-sudden). After excluding individuals who had experienced the death of a close other within the past 6 months, based on current diagnostic criteria for PGD, significant differences were found with regard to the loss groups. Individuals bereaved due to an overdose or suicide death of a loved one were more likely to meet or exceed the symptom threshold for PGD severity, with 74% and 74.5% meeting or exceeding the suggested cut-off, respectively, compared to their natural-sudden death loss counterparts,  $\chi^2(2, N = 346) = 48.89, p < 0.001$ . Using Bonferroni adjustment to account for Type I error inflation, post hoc tests revealed no significant differences between overdose and suicide loss in terms of rates of meeting or exceeding the PGD threshold, suggesting rates of PGD may be similar among these two populations. Significant results of the chi-square test emerged for PTSD, with 43% of individuals bereaved by overdose and 52.2% of survivors of suicide loss meeting or exceeding the symptom severity threshold, whereas 21.1% of natural sudden loss survivors met or exceeded the cut-off,  $\chi^2(2, N = 351) = 23.04, p < 0.001$ . Post hoc tests indicated that rates of PTSD symptom severity did not significantly

differ between overdose and suicide bereaved individuals. Overdose ( $n = 59$ ; 51.3%) and suicide loss survivors ( $n = 100$ ; 54.1%) also had significantly greater rates of clinically significant MDD symptoms compared to individuals who lost a close other due to sudden natural causes ( $n = 33$ ; 32%),  $\chi^2(2, N = 403) = 13.72, p = 0.001$ , but did not differ when compared to each other. The prevalence of individuals at elevated risk for suicide was significantly different between loss groups, with 22.6% of overdose, 35.7% of suicide, and 20.4% of sudden natural loss grievors reporting at least greater than low risk for suicide,  $\chi^2(2, N = 403) = 10.02, p = 0.007$ . Post hoc tests indicated that individuals confronted with the suicide death of a close other had a significantly higher risk for suicide, with overdose and sudden natural loss survivors having rates of suicide risk that were not significantly distinct. Rates of meeting or exceeding the symptom threshold for GAD did not significantly differ between the loss groups,  $\chi^2(2, N = 403) = 4.63, p = 0.09$ .

To examine the association between overdose loss and mental health symptom thresholds and suicide risk, after adjusting for demographic (e.g., age and gender of respondent, number of pre-death psychiatric disorders) and loss-related variables (e.g., TSL, pre-death closeness, relationship to the decedent), a series of logistic regression analyses were conducted. Demographic and loss-related variables that were either (a) significantly associated with outcomes, (b) disproportionately represented among loss groups, (c) or have been associated with outcomes based on extant literature were included in the logistic regression models as covariates. Overall, after considering the temporal requirements for each mental health outcome (i.e., PGD, PTSD), a total of 226 (64.4%) respondents were identified as meeting or exceeding the threshold for PGD, 146 respondents for PTSD (41.6%), 192 for MDD (47.6%), 147 for GAD (36.5%), and 113 (28%) were identified as having an elevated (greater than low or no risk) level of suicide risk in the current sample, based on recommended cut-offs. With regard to possible comorbidity, 236 (58.6%) respondents were identified as meeting or exceeding the symptom severity threshold for two or more mental health outcomes. Table 4 presents the results for the series of binary logistic regression models. For all models, sudden natural death was selected as the reference category in order to provide a comparison of odds ratios for meeting or exceeding cut-offs for mental health symptom severity or suicide risk between overdose and suicide bereavement. The first model examined PGD and included the identified covariates of respondent gender, respondent age, respondent history of psychiatric diagnoses, TSL, pre-death closeness, relationship category of the decedent (nuclear family vs. all others), the impact of COVID-19, and cause of death based on significant correlation coefficients and extant literature. Results indicated nuclear family members were three and a half times more likely to meet or exceed the symptom threshold for PGD (OR = 3.50; 95% CI = 1.89–6.47). Relatedly, having a close relationship with the decedent (OR = 1.04; 95% CI = 0.99–1.09) was related to PGD severity, albeit approaching a level of significance, while gender, age, previous psychiatric diagnoses, time since the death, and completing the assessment during COVID-19 were not significant predictors in the model, after accounting for all other variables. Compared to losing a loved one or close other to sudden natural causes, grief following overdose was associated with a nearly three-fold increase in risk for PGD (OR = 2.74; 95% CI = 1.34–5.59), while losing a loved one to suicide represented a similar risk for PGD (OR = 2.70; 95% CI = 1.43–5.10), after adjusting for all other variables in the

model. With regard to PTSD, younger age (OR = 0.98; 95% CI = 0.96–0.99), recency of the death (OR = 0.98; 95% CI = 0.97–0.99), pre-death closeness (OR = 1.07; 95% CI = 1.03–1.12), and losing a nuclear family member (OR = 2.86; 95% CI = 1.48–5.54) were significantly associated with PTSD symptom severity. Individuals bereaved following a fatal overdose were approximately three times more likely to meet or exceed the cut-off for PTSD (OR = 2.99; 95% CI = 1.48–6.36), while suicide loss survivors were approximately four times more likely to meet or exceed the symptom threshold for PTSD (OR = 3.77; 95% CI = 1.89–7.54) compared to sudden natural loss survivors, even after adjusting for all other variables in the model. MDD symptom severity was significantly associated with gender (OR = 1.89; 95% CI = 1.01–3.52), age (OR = 0.98; 95% CI = 0.97–1.00), the number of previous mental health diagnoses of the respondent (OR = 1.32; 95% CI = 1.09–1.59), and time since the death (OR = 0.99; 95% CI = 0.98–0.99). Regarding mode of loss, individuals who confronted the overdose loss of a close other were two and a half times more likely (OR = 2.53; 95% CI = 1.26–5.07) to report symptoms that met or exceeded the threshold for MDD compared to sudden natural loss survivors, while those losing a close other to suicide were twice as likely to meet these criteria (OR = 2.15; 95% CI = 1.14–4.03), after adjusting for covariates in the model. Identifying as female (OR = 2.24; 95% CI = 1.11–4.53), being of a younger age (OR = 0.95; 95% CI = 0.94–0.97), the number of pre-death psychiatric diagnoses (OR = 1.56; 95% CI = 1.27–1.92), and being more recently bereaved (OR = 0.99; 95% CI = 0.97–0.99) were associated with a risk for symptoms that exceeded the clinical cut-off for GAD, while all other covariates were not significantly associated. Cause of death was not significantly associated with GAD after accounting for all other variables in the model. Our final model examined the relationship between demographic and loss variables and suicide risk. Of the demographic variables, only pre-death psychiatric diagnoses (OR = 1.44; 95% CI = 1.21–1.72) was identified as a significant predictor of suicide risk in the current sample. Although overdose loss was not significantly associated with suicide risk in the current sample, individuals bereaved by suicide (OR = 2.26; 95% CI = 1.11–4.62) were twice as likely to have an elevated risk for suicide compared to individuals bereaved following a sudden natural loss, even after controlling for all other variables in the model.

## 4 | DISCUSSION

Results of this study indicated that the overall mental health burden of overdose loss is substantial, with a substantial percentage of survivors exceeding the proposed threshold for symptom severity for a number of psychiatric conditions, based on self-report, and in a manner consistent with our hypotheses. Nearly three-fourths of overdose loss survivors in our sample reporting clinically significant prolonged grief symptoms. Approximately half of all overdose bereft respondents endorsed elevated levels of PTSD and depression symptoms while nearly one-third reported markedly high levels of generalized anxiety symptoms. Notably, nearly one-fourth of all overdose loss survivors endorsed greater than minimal suicide risk. In particular, and even after adjusting for the influence of a multitude of covariates, overdose loss survivors were nearly three times as likely to meet or exceed the suggested cut-off for a positive screen for PGD compared to individuals who were confronted with the sudden natural death of a close other. Similarly, overdose loss survivors were three times more likely to endorse clinically significant PTSD symptoms, while being

approximately two and a half times more likely to meet the threshold for major depressive disorder relative to their natural sudden loss survivor counterparts. To the best of our knowledge, this was the first study to empirically examine mood disorder symptoms and suicide risk among overdose loss survivors relative to other forms of sudden or violent loss, broadening knowledge about other mental health challenges in this substantially under-investigated loss group. With overdose deaths climbing at an alarming rate in the United States, particularly during the COVID-19 pandemic, this information crucially draws attention to a burgeoning population that may be in need of evidence-based interventions or promising provisions of support.

Like the current study, high levels of grief-related symptoms among overdose loss survivors were found in the two studies that objectively assessed grief-related difficulties in the context of overdose bereavement (e.g., Titlestad et al., 2021). Results here support those produced by Feigelman et al. (2011) that identified comparable levels of PGD between overdose and suicide loss, the latter group which is widely recognized as a population of mourners that experience myriad mental health challenges in the wake of loss and thus merit empirical and clinical attention. Elevated grief symptoms among suicide loss survivors have been associated with the high levels of perceived and actual stigma in the extant literature, suggesting that this unique grief-related theme, among others, may be one mechanism that exacerbates deleterious grief-related symptoms (e.g., Feigelman et al., 2009). For example, in a recent study of 195 suicide bereaved individuals, the level of perceived stigma was significantly and positively associated with grief difficulties (Oexle et al., 2020). Perceived loss-related stigma may not exclusively exacerbate grief-related difficulties. In their study of 462 parents who lost a child to suicide, Feigelman et al. (2009) reported that survivors experienced harmful reactions from others, strained relationships, and other forms of stigma following the loss, and importantly, identified a strong association between these forms of stigma, depressive symptoms, and suicidality, not merely grief-related difficulties. However, in a recent study of 240 suicide loss survivors, depressive symptoms were significantly related to perceptions of stigma while PGD symptoms were not (Scocco et al., 2019). Given the shared vulnerability for PGD symptoms, as well as the congruency of grief-related themes (e.g., guilt, search for why the death occurred, and stigma) evidenced among suicide and overdose loss survivors alike, it stands to reason that markedly high levels of loss-related stigma, among other grief-related themes, serve as factors underlying the exacerbation of PGD symptomatology among the overdose bereaved. However, to-date, an examination of the relationship between grief-related themes, such as perceived stigma and guilt, and PGD symptoms in the context of overdose bereavement has yet to be conducted. Such information is valuable, and may reveal promising pathways for clinical intervention to address challenging grief-related themes, such as fostering connection with other overdose bereaved individuals against the backdrop of societal stigmatization, or cognitive therapy in the context of grief-related guilt or perceptions of responsibility.

Although the suicide bereaved appeared to be at particular risk for experiencing clinically elevated PTSD symptoms in our sample, overdose loss survivors in the current study endorsed symptoms at a significantly greater rate than other sudden loss survivors. These elevations are unsurprising given that the aetiology of trauma-related symptoms following loss is tied to the degree of violence of the death, or the propensity for exposure to death-

related imagery, whether through direct discovery of the body or indirect descriptions of the death scene. Indeed, qualitative research has highlighted the harrowing account and subsequent challenges of individuals who discovered the decedent or attempted to provide aid in the acute aftermath of a fatal overdose (Feigelman et al., 2018; Ford et al., 2017; Templeton et al., 2016). Unfortunately, the current study does not include information about exposure to the death scene. As such, future research should examine levels of exposure and associated trauma-related outcomes to further examine factors that may generate PTSD symptoms in this population. If direct or indirect exposure to the death scene is indeed a predictor of trauma-like reactions in this population, components of evidence-based practice for trauma-related disorders (e.g., imaginal exposure) may serve as an efficacious vehicle for adaptation in the wake of loss and should be subsequently examined through treatment-outcome research.

As noted throughout, research on the deleterious outcomes among overdose loss is scarce. Prior research has described the phenomenology of overdose loss, including evidence that indicates greater levels of PGD and PTSD symptomatology in this population (Feigelman et al., 2011; Titlestad et al., 2021), but these studies did not systematically assess for mood-related symptomatology and suicide risk. Thus, the findings presented here help to enhance our understanding of the burden of overdose loss. Further, results from the current study suggests that overdose loss survivors contend with mood-related psychopathology and suicide risk at greater rates than their natural sudden death bereaved counterparts, which is largely consistent with research that has found that a substantial proportion of sudden loss survivors experience elevated suicide potential in particular (e.g., Williams et al., 2018). Additionally, our findings indicate that suicide loss survivors appear to be especially vulnerable to the conferment of suicide risk—findings that have been well-established across multiple studies (e.g., Pitman et al., 2016; van de Venne et al., 2016). Future research should continue to examine suicide risk in the context of traumatic loss, examining the mechanisms that underlie risk as well as the factors that may differentiate suicide from other forms of traumatic loss, such as overdose bereavement. As a standard of clinical practice, suicide risk should be evaluated and addressed prior to commencing an evidence-informed treatment, and having an awareness of the prevalence and correlates of suicide potential among the overdose bereft who seek care is critically important for service providers.

#### 4.1 | Limitations

Notwithstanding the novelty and importance of the current study findings, a number of limitations should be noted. First, all sampled groups in this convenience sample survey are not necessarily representative of these groups as they may be found in the population at large. Like most other surveys of the traumatically bereaved, our respondents were highly educated, wealthier, mostly white females who were recruited from support organizations and a small number of collegiate volunteers. However, we hope that our broad recruitment strategies (e.g., social media) helped to mitigate this limitation. Additionally, the current study did not assess for the respondent's perception of the intentionality of the death. Research suggests that approximately one-quarter of all opioid-related overdose deaths are intentional (Oquendo & Volkow, 2018), so it is plausible that some respondents misclassified the cause of death of the decedent. Differences identified in this study might have been

attenuated if we were able to adjust for the perceived intentionality of the death, as when survivors might have considered a drug overdose as being completely volitional. Nevertheless, we were most chiefly interested in how the bereaved interpreted the cause of death, and as such, participants were able to identify the mode of death for themselves. The current findings could have been influenced by high levels of pre-existing mental health challenges among overdose loss respondents, such as substance use or mood-related symptoms, given shared risk and vulnerability often seen in this population (e.g., Orford et al., 2013; Treasure, 2004). However, the inclusion of previous mental health diagnoses as a covariate in our analyses helped to account for this potential confound. There is an additional potential bias problem from the sudden natural death bereaved group, which included many of the collegiate volunteers. They differed from the other two subgroups, in being younger, more racially diverse, and less likely to be first degree relatives of the deceased, compared to the overdose and suicide bereaved respondents. Yet, as Table 4 very clearly shows, when all potential demographic confounders are simultaneously considered in the model, the differences between the subgroups in important mental health symptomology still remain. Future studies should employ large, representative samples whenever possible in order to obtain results that are more inclusive of all overdose loss survivors. Another inherent limitation in the current study relates to the utilization of self-report instruments. Though valid assessment tools that can differentiate those who may meet diagnostic criteria for psychiatric conditions, these measures are not sufficient to provide diagnostic determinations. As such, research employing structured clinical interviews with a representative sample of overdose loss survivors should provide a more accurate depiction of the rates of psychiatric diagnoses within the population.

## 5 | CONCLUSION

This study builds upon previous research that identified high levels of grief- and trauma-related symptomatology, and is the first to examine the symptom severity of MDD, GAD, and suicide risk among the overdose bereaved and thus represents a contribution to literature on an understudied, yet burgeoning, population. After adjusting for a number of covariates, and compared to sudden-natural loss survivors, overdose loss survivors appeared to be at great risk for meeting or exceeding the symptom severity threshold for PGD, PTSD, and MDD, though differences in GAD symptoms and suicide risk were not statistically significant. Furthermore, overdose loss survivors in our sample had severe grief and mental health-related challenges that nearly consistently overlapped with suicide loss survivors—a population that has been widely recognized as being particularly vulnerable to adverse outcomes. As such, the results presented here highlight the need to further explore this understudied and vulnerable population, including the mechanisms that exacerbate or attenuate symptomatology, in order to design and disseminate efficacious forms of support and intervention.

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## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## REFERENCES

- Agerbo E (2005). Midlife suicide risk, partner's psychiatric illness, spouse and child bereavement by suicide or other modes of death: A gender specific study. *Journal of Epidemiology and Community Health*, 59(5), 407–412. 10.1136/jech.2004.024950 [PubMed: 15831691]
- Bailey SE, Kral MJ, & Dunham K (1999). Survivors of suicide do grieve differently: Empirical support for a common sense proposition. *Suicide & Life-Threatening Behavior*, 29(3), 256–271. 10.1111/j.1943-278X.1999.tb00301.x [PubMed: 10531638]
- Barry LC, Kasl SV, & Prigerson HG (2002). Psychiatric disorders among bereaved persons: The role of perceived circumstances of death and preparedness for death. *American Journal of Geriatric Psychiatry*, 10(4), 447–457. 10.1097/00019442-200207000-00011
- Blevins CA, Weathers FW, Davis MT, Witte TK, & Domino JL (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498. 10.1002/jts.22059 [PubMed: 26606250]
- Boelen PA (2015). Peritraumatic distress and dissociation in prolonged grief and posttraumatic stress following violent and unexpected deaths. *Journal of Trauma and Dissociation*, 16(5), 541–550. 10.1080/15299732.2015.1027841 [PubMed: 26156555]
- Bottomley JS, Campbell KA, & Neimeyer RA (2021). Examining bereavement-related needs and outcomes among survivors of sudden loss: A latent profile analysis. [Manuscript submitted for publication]. Department of Psychology, The University of Memphis.
- Bottomley JS, Smigelsky MA, Floyd RG, & Neimeyer RA (2017). Closeness and conflict with the deceased: Exploring the factor structure of the quality of relationships inventory in a bereaved student sample. *Omega: The Journal of Death and Dying*, 79, 377–393. 10.1177/0030222817718959 [PubMed: 28679346]
- Centers for Disease Control and Prevention. (2021). Overdose deaths accelerating during COVID-19 | CDC online newsroom | CDC. Retrieved from <https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.html>
- Cerel J, Maple M, van de Venne J, Brown M, Moore M, & Flaherty C (2017). Suicide exposure in the population: Perceptions of impact and closeness. *Suicide and Life-Threatening Behavior*, 47, 1–708. 10.1111/sltb.12333
- Christiansen SG, Reneflot A, Stene-Larsen K, & Johan Hauge L (2020). Parental mortality following the loss of a child to a drug-related death. *European Journal of Public Health*, 30(6), 1098–1102. 10.1093/eurpub/ckaa094 [PubMed: 32535625]
- Currier JM, Holland JM, & Neimeyer RA (2006). Sense-making, grief, and the experience of violent loss: Toward a mediational model. *Death Studies*, 30(5), 403–428. 10.1080/07481180600614351 [PubMed: 16610156]
- Dyregrov K, Møgster B, Titlestad KB, Løseth H-M, & Lorås L (2019). Den spesielle sorgen ved narkotikarelatert død. *Psyke & Logos*, 39(1), 92–109. Retrieved from <https://tidsskrift.dk/psyke/article/view/112166>
- Feigelman W, Feigelman B, & Range LM (2018). Grief and healing trajectories of drug-death-bereaved parents. *Omega: The Journal of Death and Dying*, 80–647, 003022281875466. 10.1177/0030222818754669
- Feigelman W, Gorman BS, & Jordan JR (2009). Stigmatization and suicide bereavement. *Death Studies*, 33(7), 591–608. 10.1080/07481180902979973 [PubMed: 19623760]
- Feigelman W, Jordan JR, & Gorman BS (2011). Parental grief after a child's drug death compared to other death causes: Investigating a greatly neglected bereavement population. *Omega: Journal of Death and Dying*, 63, 291–316. 10.2190/OM.63.4.a [PubMed: 22010370]

- Ford A, McKell J, Templeton L, & Valentine C (2017). The impact of a substance-related death. In Valentine C (Ed.), *Families bereaved by alcohol or drugs* (pp. 43–66). Routledge. 10.4324/9781315670294-4
- Guy P (2004). Bereavement through drug use: Messages from research. *Social Work in Action*, 16(1), 43–54. 10.1080/0950315042000254956
- Hanschmidt F, Lehnig F, Riedel-Heller SG, Kersting A, Scocco P, Castriotta C, & Fletcher K (2016). The stigma of suicide survivorship and related consequences—A systematic review. *PLoS One*, 11(9), e0162688. 10.1371/journal.pone.0162688 [PubMed: 27657887]
- Jordan JR (2001). Is suicide bereavement different? A reassessment of the literature. *Suicide and Life-Threatening Behavior*, 31(1), 91–102. 10.1521/suli.31.1.91.21310 [PubMed: 11326773]
- Keesee NJ, Currier JM, & Neimeyer RA (2008). Predictors of grief following the death of one's child: The contribution of finding meaning. *Journal of Clinical Psychology*, 64(10), 1145–1163. 10.1002/jclp.20502 [PubMed: 18698614]
- Kölves K, Zhao Q, Ross V, Hawgood J, Spence SH, & de Leo D (2020). Suicide and sudden death bereavement in Australia: A longitudinal study of family members over 2 years after death. *Australian and New Zealand Journal of Psychiatry*, 54(1), 89–98. 10.1177/0004867419882490 [PubMed: 31647307]
- Kristensen P, Weisaeth L, & Heir T (2012). Bereavement and mental health after sudden and violent losses: A review. *Psychiatry*, 75(1), 76–97. 10.1521/psyc.2012.75.1.76 [PubMed: 22397543]
- Kroenke K, Strine TW, Spitzer RL, Williams JBW, Berry JT, & Mokdad AH (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*, 114(1–3), 163–173. 10.1016/j.jad.2008.06.026 [PubMed: 18752852]
- Latham AE, & Prigerson HG (2004). Suicidality and bereavement: Complicated grief as psychiatric disorder presenting greatest risk for suicidality. *Suicide and Life-Threatening Behavior*, 34(4), 350–362. 10.1521/suli.34.4.350.53737 [PubMed: 15585457]
- Leventhal AM, Pettit JW, & Lewinsohn PM (2011). Familial influence of substance use disorder on emotional disorder across three generations. *Psychiatry Research*, 185(3), 402–407. 10.1016/j.psychres.2010.08.013 [PubMed: 20825999]
- Lobb EA, Kristjanson LJ, Aoun SM, Monterosso L, Halkett GKB, & Davies A (2010). Predictors of complicated grief: A systematic review of empirical studies. *Death Studies*, 34(8), 673–698. 10.1080/07481187.2010.496686 [PubMed: 24482845]
- Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, & Herzberg PY (2008). Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Medical Care*, 46(3), 266–274. 10.1097/MLR.0b013e318160d093 [PubMed: 18388841]
- Midi H, Sarkar SK, & Rana S (2010). Collinearity diagnostics of binary logistic regression model. *Journal of Interdisciplinary Mathematics*, 13(3), 253–267. 10.1080/09720502.2010.10700699
- Mitchell AM, Kim Y, Prigerson HG, & Mortimer MK (2005). Complicated grief and suicidal ideation in adult survivors of suicide. *Suicide and Life-Threatening Behavior*, 35(5), 498–506. 10.1521/suli.2005.35.5.498 [PubMed: 16268767]
- Nadorff RM, Nazem S, & Fiske A (2013). Insomnia symptoms, nightmares, and suicide risk: Duration of sleep disturbance matters. *Suicide and Life-Threatening Behavior*, 43(2), 139–149. 10.1111/sltb.12003 [PubMed: 23278677]
- Oxle N, Feigelman W, & Sheehan L (2020). Perceived suicide stigma, secrecy about suicide loss and mental health outcomes. *Death Studies*, 44(4), 248–255. 10.1080/07481187.2018.1539052 [PubMed: 30451645]
- Oquendo MA, & Volkow ND (2018). Suicide: A silent contributor to opioid-overdose deaths. *New England Journal of Medicine*, 378(17), 1567–1569. 10.1056/nejmp1801417 [PubMed: 29694805]
- Orford J, Velleman R, Natera G, Templeton L, & Copello A (2013). Addiction in the family is a major but neglected contributor to the global burden of adult ill-health. *Social Science and Medicine*, 78(1), 70–77. 10.1016/j.socscimed.2012.11.036 [PubMed: 23268776]
- Osman A, Bagge CL, Gutierrez PM, Konick LC, Kopper BA, & Barrios FX (2001). The suicidal behaviors questionnaire-revised (SBQ-R): Validation with clinical and nonclinical samples. *Assessment*, 8(4), 443–454. 10.1177/107319110100800409 [PubMed: 11785588]

- Pitman A, Osborn D, King M, & Erlangsen A (2014). Effects of suicide bereavement on mental health and suicide risk. *The Lancet Psychiatry*, 1(1), 86–94. 10.1016/S2215-0366(14)70224-X [PubMed: 26360405]
- Pitman AL, Osborn DPJ, Rantell K, & King MB (2016). Bereavement by suicide as a risk factor for suicide attempt: A cross-sectional national UK-wide study of 3432 young bereaved adults. *BMJ Open*, 6(1), e009948. 10.1136/bmjopen-2015-009948
- Prigerson H (2004). Complicated grief: When the path of adjustment leads to a dead-end. *Bereavement Care*, 23(3), 38–40. 10.1080/02682620408657612
- Prigerson HG, Maciejewski PK, Reynolds CF, Bierhals AJ, Newsom JT, Fasiczka A, Miller M, Doman J, & Miller M (1995). Inventory of complicated grief: A scale to measure maladaptive symptoms of loss. *Psychiatry Research*, 59(1–2), 65–79. 10.1016/0165-1781(95)02757-2 [PubMed: 8771222]
- Qin P, Agerbo E, & Mortensen PB (2003). Suicide risk in relation to socioeconomic, demographic, psychiatric, and familial factors: A national register-based study of all suicides in Denmark, 1981–1997. *American Journal of Psychiatry*, 160(4), 765–772. 10.1176/appi.ajp.160.4.765 [PubMed: 12668367]
- Rheingold AA, Zinzow H, Hawkins A, Saunders BE, & Kilpatrick DG (2012). Prevalence and mental health outcomes of homicide survivors in a representative US sample of adolescents: Data from the 2005 National Survey of Adolescents. *Journal of Child Psychology and Psychiatry*, 53(6), 687–694. [PubMed: 22211367]
- Scholl L, Seth P, Wilson N, Baldwin G, & Kariisa M (2018). Drug and opioid-involved overdose deaths — United States, 2013–2017. *MMWR. Morbidity and Mortality Weekly Report*, 67(5152). 10.15585/mmwr.mm6751521e1
- Scocco P, Preti A, Totaro S, Corrigan PW, & Castriotta C (2019). Stigma, grief and depressive symptoms in help-seeking people bereaved through suicide. *Journal of Affective Disorders*, 244, 223–230. 10.1016/j.jad.2018.10.098 [PubMed: 30366261]
- Seth P, Rudd RA, Noonan RK, & Haegerich TM (2018). Quantifying the epidemic of prescription opioid overdose deaths. *American Journal of Public Health*, 108(4), 500–502. 10.2105/ajph.2017.304265 [PubMed: 29513577]
- Shin C, Lee SH, Han KM, Yoon HK, & Han C (2019). Comparison of the usefulness of the PHQ-8 and PHQ-9 for screening for major depressive disorder: Analysis of psychiatric outpatient data. *Psychiatry Investigation*, 16(4), 300–305. 10.30773/pi.2019.02.01 [PubMed: 31042692]
- Slavova S, Rock P, Bush HM, Quesinberry D, & Walsh SL (2020). Signal of increased opioid overdose during COVID-19 from emergency medical services data. *Drug and Alcohol Dependence*, 214, 108176. 10.1016/j.drugalcdep.2020.108176 [PubMed: 32717504]
- Spitzer RL, Kroenke K, Williams JBW, & Löwe B (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. 10.1001/archinte.166.10.1092 [PubMed: 16717171]
- Stroebe M, Schut H, & Stroebe W (2007, December 8). Health outcomes of bereavement. *Lancet*, 370, 1960, 1973. 10.1016/S0140-6736(07)61816-9 [PubMed: 18068517]
- Sullivan G, Vasterling JJ, Han X, Tharp AT, Davis T, Deitch EA, & Constans JI (2013). Preexisting mental illness and risk for developing a new disorder after hurricane katrina. *Journal of Nervous and Mental Disease*, 201(2), 161–166. 10.1097/NMD.0b013e31827f636d [PubMed: 23364127]
- Tal I, Mauro C, Reynolds CF, Shear MK, Simon N, Lebowitz B, Zisook S, Wang Y, Qiu X, Iglewicz A, Glorioso D, Avanzino J, Wetherell JL, Karp JF, Robinaugh D, & Zisook S (2017). Complicated grief after suicide bereavement and other causes of death. *Death Studies*, 41(5), 267–275. 10.1080/07481187.2016.1265028 [PubMed: 27892842]
- Templeton L, Ford A, McKell J, Valentine C, Walter T, Velleman R, Hollywood J, Hay G, & Hollywood J (2016). Bereavement through substance use: Findings from an interview study with adults in England and Scotland. *Addiction Research and Theory*, 24(5), 341–354. 10.3109/16066359.2016.1153632
- Titlestad KB, Lindeman SK, Lund H, & Dyregrov K (2019). How do family members experience drug death bereavement? A systematic review of the literature. *Death Studies*, 0(0), 1–14. 10.1080/07481187.2019.1649085

- Titlestad KB, Schmid MT, & Dyregrov K (2021). Prevalence and predictors of prolonged grief symptoms among those bereaved from a drug-related death in a convenience sample of Norwegian parents: A cross-sectional study. *Death Studies*, 0(0), 1–10. 10.1080/07481187.2020.1867255
- Titlestad KB, Stroebe MM, & Dyregrov K (2020). How do drug-death-bereaved parents adjust to life without the deceased? A qualitative study. *Omega (United States)*, 82(1), 141–164. 10.1177/0030222820923168
- Treasure J (2004). Review: Exploration of psychological and physical health differences between caregivers and non-caregivers. *Evidence-Based Mental Health*, 7, 28–28. 10.1136/ebmh.7.1.28 [PubMed: 14769672]
- Unterhitzberger J, Sachser C, & Rosner R (2020). Posttraumatic stress disorder and childhood traumatic loss: A secondary analysis of symptom severity and treatment outcome. *Journal of Traumatic Stress*, 33(3), 208–217. 10.1002/jts.22499 [PubMed: 32216150]
- Valentine C, Bauld L, & Walter T (2016). Bereavement following substance misuse. *Omega: The Journal of Death and Dying*, 72(4), 283–301. 10.1177/0030222815625174
- Van Ameringen M, Mancini C, Patterson B, & Boyle MH (2008). Post-traumatic stress disorder in Canada. *CNS Neuroscience and Therapeutics*, 14(3), 171–181. 10.1111/j.1755-5949.2008.00049.x [PubMed: 18801110]
- van de Venne J, Cerel J, Moore M, & Maple M (2016). Predictors of suicide ideation in a random digit dial study: Exposure to suicide matters. *Archives of Suicide Research*, 21(3), 425–437. 10.1080/13811118.2016.1211044 [PubMed: 27440559]
- Williams JL, Eddinger JR, Rynearson EK, & Rheingold AA (2018). Prevalence and correlates of suicidal ideation in a treatment-seeking sample of violent loss survivors. *Crisis*, 39(5), 377–385. 10.1027/0227-5910/a000520 [PubMed: 29848082]
- Zinzow HM, Rheingold AA, Hawkins AO, Saunders BE, & Kilpatrick DG (2009). Losing a loved one to homicide: Prevalence and mental health correlates in a national sample of young adults. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, 22(1), 20–27.
- Zisook S, Chentsova-Dutton Y, & Shuchter SR (1998). PTSD following bereavement. *Annals of Clinical Psychiatry*, 10(4), 157–163. 10.1023/A:1022342028750 [PubMed: 9988056]

**TABLE 1**

Demographic, characteristics of the death, and mean levels of outcomes by loss type

| Features        | Overdose loss ( <i>n</i> = 115) |           | Suicide loss ( <i>n</i> = 185) |           | Sudden-natural loss ( <i>n</i> = 103) |           | Analysis |          |
|-----------------|---------------------------------|-----------|--------------------------------|-----------|---------------------------------------|-----------|----------|----------|
|                 | <i>n</i>                        | %         | <i>n</i>                       | %         | <i>n</i>                              | %         | $\chi^2$ | <i>P</i> |
| Female          | 98                              | 85.2      | 165                            | 89.2      | 75                                    | 72.8      | 13.32    | 0.001    |
| Ethnicity       |                                 |           |                                |           |                                       |           | 51.67    | <0.001   |
| White           | 99                              | 86.1      | 148                            | 80.0      | 54                                    | 52.4      |          |          |
| Black           | 5                               | 4.3       | 13                             | 7.0       | 31                                    | 30.1      |          |          |
| Latinx          | 4                               | 3.5       | 13                             | 7.0       | 8                                     | 7.8       |          |          |
| All others      | 7                               | 6.1       | 11                             | 6.0       | 10                                    | 9.7       |          |          |
| Person who died |                                 |           |                                |           |                                       |           | 120.66   | <0.001   |
| Child           | 74                              | 64.3      | 73                             | 39.5      | 7                                     | 6.8       |          |          |
| Sibling         | 19                              | 16.5      | 37                             | 20.0      | 7                                     | 6.8       |          |          |
| Parent          | 2                               | 1.7       | 17                             | 9.2       | 19                                    | 18.4      |          |          |
| Spouse/Partner  | 8                               | 7.0       | 24                             | 13.0      | 4                                     | 3.9       |          |          |
| Relative        | 3                               | 2.6       | 14                             | 7.5       | 53                                    | 51.4      |          |          |
| Friend          | 9                               | 7.8       | 20                             | 10.8      | 7                                     | 6.8       |          |          |
| COVID-19        | 16                              | 13.9      | 58                             | 31.4      | 5                                     | 4.9       | 32.78    | <0.001   |
|                 | <i>M</i>                        | <i>SD</i> | <i>M</i>                       | <i>SD</i> | <i>M</i>                              | <i>SD</i> | <i>F</i> | <i>P</i> |
| Age             | 50.26                           | 13.87     | 45.51                          | 15.87     | 27.67                                 | 13.66     | 71.54    | <0.001   |
| TSL             | 21.83                           | 15.29     | 25.99                          | 19.54     | 25.64                                 | 16.23     | 2.17     | 0.116    |
| Outcomes        |                                 |           |                                |           |                                       |           |          |          |
| ICG-R           | 35.37                           | 11.65     | 35.89                          | 12.63     | 21.79                                 | 13.65     | 49.11    | <0.001   |
| PCL-5           | 33.27                           | 14.71     | 36.39                          | 17.24     | 18.81                                 | 16.55     | 39.75    | <0.001   |
| PHQ-8           | 10.37                           | 6.01      | 10.62                          | 6.03      | 6.87                                  | 5.80      | 14.39    | <0.001   |
| GAD-7           | 7.87                            | 5.62      | 8.83                           | 5.75      | 6.62                                  | 5.75      | 4.97     | 0.007    |
| SBQ-R           | 6.06                            | 3.48      | 6.94                           | 3.24      | 5.31                                  | 2.97      | 8.73     | <0.001   |

Note: COVID-19, Assessment took place during the COVID-19 pandemic; TSL, Time since the death (in months).

Abbreviations: GAD-7, Generalized Anxiety Disorder seven-item scale; ICG, Inventory of Complicated Grief; PCL-5, PTSD Checklist for DSM-5; PHQ-8, Patient Health Questionnaire-8; PTSD, posttraumatic stress disorder; SBQ-R, Suicidal Behaviors Questionnaire-Revised.

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**TABLE 2**  
Correlations between symptomatology, demographic, relational, and loss-related variables

|                                    | 1                   | 2                   | 3                   | 4                   | 5                  | 6                  | 7                   | 8                   | 9                   | 10    | 11                 | 12   | 13 |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|---------------------|---------------------|---------------------|-------|--------------------|------|----|
| 1 PGD severity                     | -                   | -                   | -                   | -                   | -                  | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 2 PTSD severity                    | 0.70 <sup>**</sup>  | -                   | -                   | -                   | -                  | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 3 Depression severity              | 0.54 <sup>**</sup>  | 0.66 <sup>**</sup>  | -                   | -                   | -                  | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 4 Anxiety severity                 | 0.44 <sup>**</sup>  | 0.57 <sup>**</sup>  | 0.70 <sup>**</sup>  | -                   | -                  | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 5 Suicide risk severity            | 0.31 <sup>**</sup>  | 0.36 <sup>**</sup>  | 0.42 <sup>**</sup>  | 0.34 <sup>**</sup>  | -                  | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 6 Respondent gender                | 0.13 <sup>**</sup>  | 0.19 <sup>**</sup>  | 0.18 <sup>*</sup>   | 0.17 <sup>**</sup>  | 0.09               | -                  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 7 Respondent age                   | 0.30 <sup>**</sup>  | 0.14 <sup>**</sup>  | -0.01               | -0.23 <sup>**</sup> | 0.01               | 0.12 <sup>*</sup>  | -                   | -                   | -                   | -     | -                  | -    | -  |
| 8 Respondent ethnicity             | -0.16 <sup>**</sup> | -0.09               | 0.01                | -0.02               | -0.01              | -0.17 <sup>*</sup> | -0.32 <sup>**</sup> | -                   | -                   | -     | -                  | -    | -  |
| 9 Pre-loss respondent psych Dx (#) | 0.20 <sup>**</sup>  | 0.25 <sup>**</sup>  | 0.29 <sup>**</sup>  | 0.32 <sup>**</sup>  | 0.32 <sup>**</sup> | 0.09               | -0.14 <sup>*</sup>  | -0.04               | -                   | -     | -                  | -    | -  |
| 10 Time since loss                 | -0.23 <sup>**</sup> | -0.19 <sup>**</sup> | -0.24 <sup>**</sup> | -0.17 <sup>**</sup> | -0.04              | 0.01               | 0.05                | 0.01                | -0.14 <sup>**</sup> | -     | -                  | -    | -  |
| 11 Relationship type               | 0.43 <sup>**</sup>  | 0.32 <sup>**</sup>  | 0.16 <sup>**</sup>  | 0.01                | 0.07               | 0.14 <sup>**</sup> | 0.58 <sup>**</sup>  | -0.29 <sup>**</sup> | 0.01                | -0.03 | -                  | -    | -  |
| 12 Pre-death closeness             | 0.23 <sup>**</sup>  | 0.18 <sup>**</sup>  | 0.11 <sup>*</sup>   | 0.08                | 0.12 <sup>*</sup>  | 0.09               | 0.04                | 0.02                | 0.08                | 0.01  | 0.11 <sup>*</sup>  | -    | -  |
| 13 COVID-19 impact                 | 0.17 <sup>**</sup>  | 0.15 <sup>**</sup>  | 0.05                | 0.01                | 0.02               | 0.12 <sup>*</sup>  | 0.32 <sup>**</sup>  | -0.13 <sup>*</sup>  | -0.11 <sup>*</sup>  | -0.01 | 0.22 <sup>**</sup> | 0.02 | -  |

Note: Pre-Loss Respondent Psych Dx (#) = The number of respondent pre-death mental health diagnoses; Respondent ethnicity was measured using a dichotomous variable where non-white = 0 and white = 1.

Abbreviations: PGD, Prolonged Grief Disorder; PTSD, posttraumatic stress disorder.

\*  $p < 0.05$

\*\*  $p < 0.01$ .

**TABLE 3**

Chi-square analysis examining prevalence of mental health diagnoses and elevated suicide risk based on suggested cut-off scores

| Cause of death        | Mental health diagnoses                           |  |                |  |  | Sui. Risk                           |
|-----------------------|---|--|----------------|--|--|-------------------------------------|
|                       | PGD   | PTSD   | MDD            | GAD  |  |                                     |
| Overdose <i>n</i> (%) | 74 (74)<br>$\chi^2 (2) = 48.89$<br>$p < 0.001$    | 43 (43)<br>$\chi^2 (2) = 23.04$<br>$p < 0.001$   | 59 (51.3)      | 36 (31.3)<br>$\chi^2 (2) = 13.72$<br>$p = 0.001$ | 26 (22.6)<br>$\chi^2 (2) = 4.78$<br>$p = 0.09$ | $\chi^2 (2) = 10.02$<br>$p = 0.007$ |
| Suicide <i>n</i> (%)  | 120 (74.5)<br>$\chi^2 (2) = 48.89$<br>$p < 0.001$ | 84 (52.2)<br>$\chi^2 (2) = 23.04$<br>$p < 0.001$ | 100 (54.1)     | 78 (42.2)<br>$\chi^2 (2) = 13.72$<br>$p = 0.001$ | 66 (35.7)<br>$\chi^2 (2) = 4.78$<br>$p = 0.09$ | $\chi^2 (2) = 10.02$<br>$p = 0.007$ |
| Sudden <i>n</i> (%)   | 32 (35.6)<br>$\chi^2 (2) = 48.89$<br>$p < 0.001$  | 19 (21.1)<br>$\chi^2 (2) = 23.04$<br>$p < 0.001$ | 33 (32)        | 33 (32)<br>$\chi^2 (2) = 13.72$<br>$p = 0.001$   | 21 (20.4)<br>$\chi^2 (2) = 4.78$<br>$p = 0.09$ | $\chi^2 (2) = 10.02$<br>$p = 0.007$ |
|                       | <i>n</i> = 351                                    | <i>n</i> = 351                                   | <i>n</i> = 403 | <i>n</i> = 403                                   | <i>n</i> = 403                                 | <i>n</i> = 403                      |

Abbreviations: GAD, Generalized Anxiety Disorder; MDD, Major Depressive Disorder; PGD, Prolonged Grief Disorder; PTSD, posttraumatic stress disorder.

**TABLE 4**

Binary logistic regression of factors associated with mental health diagnoses

|                          | <b>B</b> | <b>SE</b> | <b>OR</b> | <b>95% CI</b> | <b>Wald</b> | <b>p</b> |
|--------------------------|----------|-----------|-----------|---------------|-------------|----------|
| <b>PGDD Dx</b>           |          |           |           |               |             |          |
| Gender (F)               | -0.06    | 0.33      | 0.94      | [0.49, 1.80]  | 0.03        | 0.858    |
| Respondent age           | 0.01     | 0.01      | 1.00      | [0.98, 1.02]  | 0.05        | 0.820    |
| Respondent Psy Dx        | 0.19     | 0.11      | 1.20      | [0.98, 1.48]  | 3.15        | 0.076    |
| TSL                      | -0.01    | 0.01      | 0.99      | [0.98, 1.01]  | 0.43        | 0.513    |
| Closeness                | 0.04     | 0.02      | 1.04      | [0.99, 1.09]  | 3.17        | 0.075    |
| <b>Nuclear family</b>    | 1.25     | 0.31      | 3.50      | [1.89, 6.47]  | 15.99       | <0.001   |
| COVID-19                 | 0.38     | 0.36      | 1.46      | [0.73, 2.92]  | 1.14        | 0.286    |
| <b>Suicide loss</b>      | 0.99     | 0.32      | 2.70      | [1.43, 5.10]  | 9.41        | 0.002    |
| <b>Overdose loss</b>     | 1.00     | 0.36      | 2.74      | [1.34, 5.59]  | 7.64        | 0.006    |
| <b>PTSD Dx</b>           |          |           |           |               |             |          |
| Gender (F)               | 0.62     | 0.35      | 1.85      | [0.93, 3.68]  | 3.11        | 0.078    |
| <b>Respondent age</b>    | -0.02    | 0.01      | 0.98      | [0.96, 0.99]  | 0.98        | 0.018    |
| Respondent Psy Dx        | 0.18     | 0.09      | 1.20      | [0.99, 1.44]  | 3.67        | 0.055    |
| TSL                      | -0.02    | 0.01      | 0.98      | [0.97, 0.99]  | 6.48        | 0.011    |
| Closeness                | 0.06     | 0.02      | 1.07      | [1.03, 1.12]  | 7.69        | 0.006    |
| <b>Nuclear family</b>    | 1.05     | 0.33      | 2.86      | [1.48, 5.54]  | 9.78        | 0.002    |
| COVID-19                 | 0.58     | 0.30      | 1.79      | [0.99, 3.25]  | 3.70        | 0.054    |
| <b>Suicide loss</b>      | 1.33     | 0.35      | 3.77      | [1.89, 7.54]  | 14.17       | <0.001   |
| <b>Overdose loss</b>     | 1.09     | 0.38      | 2.99      | [1.48, 6.36]  | 8.12        | 0.004    |
| <b>MDD Dx</b>            |          |           |           |               |             |          |
| Gender (F)               | 0.64     | 0.32      | 1.89      | [1.01, 3.52]  | 3.99        | 0.046    |
| <b>Respondent age</b>    | -0.02    | 0.01      | 0.98      | [0.97, 1.00]  | 3.96        | 0.047    |
| <b>Respondent Psy Dx</b> | 0.28     | 0.09      | 1.32      | [1.09, 1.59]  | 8.27        | 0.004    |
| TSL                      | -0.01    | 0.01      | 0.99      | [0.98, 0.99]  | 4.37        | 0.037    |
| Closeness                | 0.03     | 0.02      | 1.03      | [0.99, 1.08]  | 2.18        | 0.140    |
| Nuclear family           | 0.26     | 0.31      | 1.29      | [0.70, 2.39]  | 0.69        | 0.406    |
| COVID-19                 | 0.41     | 0.29      | 1.51      | [0.85, 2.67]  | 1.97        | 0.160    |

|                          | <b>B</b> | <b>SE</b> | <b>OR</b> | <b>95% CI</b> | <b>Wald</b> | <b>p</b> |
|--------------------------|----------|-----------|-----------|---------------|-------------|----------|
| <b>Suicide loss</b>      | 0.77     | 0.32      | 2.15      | [1.14, 4.03]  | 5.71        | 0.017    |
| <b>Overdose loss</b>     | 0.93     | 0.35      | 2.53      | [1.26, 5.07]  | 6.84        | 0.009    |
| GAD Dx                   |          |           |           |               |             |          |
| <b>Gender (F)</b>        | 0.81     | 0.36      | 2.24      | [1.11, 4.53]  | 5.04        | 0.025    |
| <b>Respondent age</b>    | -0.05    | 0.01      | 0.95      | [0.94, 0.97]  | 23.09       | <0.001   |
| <b>Respondent Psy Dx</b> | 0.44     | 0.11      | 1.56      | [1.27, 1.92]  | 17.73       | <0.001   |
| <b>TSL</b>               | -0.02    | 0.01      | 0.99      | [0.97, 0.99]  | 4.64        | 0.031    |
| Closeness                | 0.02     | 0.02      | 1.02      | [0.97, 1.06]  | 0.56        | 0.455    |
| Nuclear family           | 0.47     | 0.34      | 1.60      | [0.82, 3.11]  | 1.93        | 0.165    |
| COVID-19                 | 0.25     | 0.32      | 1.29      | [0.69, 2.41]  | 0.61        | 0.434    |
| Suicide loss             | 0.63     | 0.34      | 1.89      | [0.96, 3.70]  | 3.39        | 0.065    |
| Overdose loss            | 0.58     | 0.39      | 1.79      | [0.83, 3.82]  | 2.25        | 0.134    |
| Suicide risk             |          |           |           |               |             |          |
| Gender (F)               | 0.06     | 0.36      | 1.06      | [0.52, 2.15]  | 0.29        | 0.865    |
| Respondent age           | -0.06    | 0.01      | 0.99      | [0.98, 1.01]  | 0.45        | 0.504    |
| <b>Respondent Psy Dx</b> | 0.36     | 0.09      | 1.44      | [1.21, 1.72]  | 16.21       | <0.001   |
| TSL                      | -0.01    | 0.01      | 0.99      | [0.99, 1.01]  | 0.17        | 0.682    |
| Closeness                | 0.04     | 0.02      | 1.04      | [0.99, 1.09]  | 2.23        | 0.135    |
| Nuclear family           | 0.03     | 0.34      | 1.02      | [0.53, 2.01]  | 0.01        | 0.942    |
| COVID-19                 | 0.23     | 0.36      | 1.25      | [0.67, 2.35]  | 0.51        | 0.476    |
| <b>Suicide loss</b>      | 0.82     | 0.36      | 2.26      | [1.11, 4.62]  | 5.04        | 0.025    |
| Overdose loss            | 0.34     | 0.41      | 1.40      | [0.63, 3.13]  | 0.69        | 0.408    |

*Note:* Nuclear Family = Child, Spouse, Parent, or Sibling (all other relationships were the reference category); Sudden Natural Loss is Reference Category. The statistical significance is included in the column listed “p” (p values). The bold text is merely a marker that these variables were significant predictors, with the corresponding significance level included in the column on the far right.

Abbreviations: CI, confidence interval; GAD Dx, Generalized Anxiety Disorder Diagnosis; MDD Dx, Major Depressive Disorder Diagnosis; PGD Dx, Prolonged Grief Disorder Diagnosis; PTSD Dx, Posttraumatic Stress Disorder Diagnosis; Respondent Psy Dx, Respondent Psychiatric History.