The Relationship Between Insomnia and Prolonged Grief: A Systematic Review of Longitudinal and Intervention Research

Ananda Zoë de Jong

Master Thesis - Clinical Forensic Psychology & Victimology

S4332970
March 2026
Department of Psychology
University of Groningen
Examiner/Daily supervisor:
Dr. Maarten Eisma

Abstract

The current review serves as an update to Lancel et al. (2020), addressing previously identified gaps concerning the lack of longitudinal and intervention research on sleep difficulties and prolonged grief. Specifically, it aimed to examine (1) the temporal relationship between sleep disturbances and prolonged grief symptoms and (2) whether therapeutic interventions targeting sleep problems reduce symptoms of prolonged grief, and vice versa. A literature search conducted in PsycINFO, PubMed, and Web of Science identified thirteen eligible studies, including six longitudinal observational studies and seven intervention trials. Findings on temporal associations were mixed. Higher-quality studies suggested that sleep disturbances may predict subsequent increases in PG symptoms, whereas evidence for the reverse direction was weaker. However, depressive symptoms frequently explained these associations. Most grief-focused intervention studies did not significantly improve sleep compared to control conditions over time, and residual sleep problems commonly persisted. Only one randomized controlled trial evaluated a sleep-focused intervention with prolonged grief as an outcome, and found no improvement over time between groups. More rigorous longitudinal and experimental research is needed to clarify temporal relationships and evaluate sleep-focused treatments for prolonged grief.

Keywords: prolonged grief disorder, grief, bereavement, insomnia, sleep, sleep disturbances

The Relationship Between Insomnia and Prolonged Grief: A Systematic Review of Longitudinal and Intervention Research

The loss of a loved one is a stressful life event that many people face, resulting in a period of grief. Albeit most people recover without needing professional intervention, a subset of people develop severe, persistent grief that significantly impairs functioning, referred to as prolonged grief (PG) (Nakajima, 2018). Prolonged grief disorder (PGD), a formal diagnosis characterized by such grief reactions, has recently been included in the International Classification of Diseases, 11th edition (ICD-11; World Health Organization [WHO], 2019) and the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, Text Revision (DSM-5-TR; American Psychiatric Association [APA], 2022). PG is often accompanied by comorbid psychiatric disorders, such as depression, anxiety, and posttraumatic stress disorder (PTSD) (Komischke-Konnerup et al., 2021). PG symptoms are associated with significant impairments in daily functioning, reduced quality of life, and an increased risk of suicidal thoughts or behaviors (Boelen & Prigerson, 2007; Latham & Prigerson, 2004), highlighting the need for evidence-based treatments for affected individuals.

Yet PG remains a challenging condition to treat effectively (Doering & Eisma, 2016). Despite the availability of targeted therapies for PG, their effect sizes have been found to fall below the threshold (i.e., Hedges' $g \geq 0.50$; Norman et al., 2003) generally considered necessary for a clinically relevant effect (Johannsen et al., 2019). More recent evidence indicates that cognitive behavioral therapies (CBTs) for PG, including cognitive behavioral therapy for complicated grief (CBT-CG; Boelen et al., 2007) and complicated grief therapy (CGT; Shear, 2010), are among the most effective treatments currently available, with an overall medium effect size that reached the threshold for a clinically meaningful effect (Komischke-Konnerup et

al., 2024). However, the magnitude of the effect may have been overestimated due to the inclusion of underpowered trials and unreported pre-post correlations by the included trials. Thus, although CBT-based interventions show the strongest evidence to date, their effects may be potentially inflated. Consequently, this highlights the need for interventions that target malleable processes that perpetuate PG. One potential treatment avenue may be to target sleep disturbances.

Sleep difficulties, such as insomnia, are among the most frequently reported complaints following bereavement (Monk et al., 2008). According to the DSM-5-TR (APA, 2022), insomnia disorder encompasses chronic problems with sleep quality or duration (e.g., recurrent difficulties with sleep onset, sleep maintenance, or early-morning awakening), occurring despite sufficient opportunity for sleep, and is commonly associated with clinically significant impairment in daytime functioning. Sleep problems are widespread in the general population, with estimates suggesting that up to 30% report at least one insomnia symptom, whereas 9% to 15% report symptoms accompanied by daytime impairment, and around 6% experience clinical insomnia (Ohayon, 2002). Furthermore, insomnia has been identified as a significant predictor for the onset of several other psychiatric conditions, including depression, anxiety, alcohol abuse, and psychosis (Hertenstein et al., 2019). The relationship between sleep difficulties and PG may be explained by the thought that acute insomnia is triggered by stressful life events (Spielman et al., 1987). Specifically, during bereavement, ruminative thoughts about the lost loved one may occupy the mind at bedtime and interfere with falling asleep (Hardison et al., 2005).

Although traditionally considered secondary symptoms of mental disorders such as major depressive disorder (MDD) and PTSD, insomnia can persist even after successful treatment of those conditions, and may actively contribute to their development and maintenance (Lancel et

al., 2021). There is growing evidence that interventions targeting sleep problems, particularly cognitive behavioral therapy for insomnia (CBT-I), can lead not only to improvements in sleep but also meaningful reductions in symptoms of other comorbid psychiatric disorders, including MDD and PTSD. To illustrate, a meta-analysis of 49 randomized controlled trials examined the impact of non-pharmacological sleep interventions on depressive symptoms, reporting that these interventions were associated with improvements in depression relative to control conditions that did not target sleep, with effect sizes in the small to moderate range (Gee et al., 2019). Furthermore, a meta-analysis of eleven randomized controlled trials examined the effects of CBT-I on both sleep and PTSD symptoms. Compared with waitlist or psychoeducation controls, participants receiving CBT-I demonstrated reduced sleep onset latency, fewer awakenings during the night, and higher overall sleep efficiency. In addition, CBT-I was associated with reductions in both self-reported and clinician-assessed PTSD symptoms (Ho et al., 2016).

The precise neurobiological pathways linking sleep with stress-related and affective disorders are not yet fully understood, yet it has been suggested that the emotional load of memories is reduced through their reactivation, processing, and consolidation during sleep, particularly rapid-eye movement (REM) sleep (Goldstein & Walker, 2014; Walker & van der Helm, 2009). However, when sleep is disturbed, as frequently occurs in stress-related and affective disorders, emotional brain processing during sleep may become impaired, possibly contributing to the maintenance of emotional memories (Riemann et al., 2010, 2012; Wassing et al., 2019).

Sleep disturbances have been shown to contribute to the development and maintenance of disorders such as MDD and PTSD, yet their potential role in the onset and persistence of PG symptoms has received comparatively little research attention. Therefore, Lancel et al. (2020)

conducted a systematic review on the role of sleep problems in bereavement. They concluded that sleep problems are highly prevalent following bereavement and that greater grief intensity is associated with more severe sleep difficulties. In accordance, sleep problems were found to be more severe and longer lasting in people experiencing PG than those experiencing normative grief patterns, especially when accompanied by depression. Furthermore, the review of the literature revealed potential risk factors contributing to sleep disturbances following bereavement, and showed that grief interventions modestly reduce sleep problems. However, the review was unable to identify any intervention studies targeting sleep difficulties in bereavement that reported on PG symptoms as an outcome, nor longitudinal research addressing whether sleep problems contribute to the persistence or intensification of PG symptoms (and vice versa). Therefore, the review emphasized the need for research using longitudinal, cross-lagged, and laboratory studies to clarify the temporal relationship between sleep disturbances and PG symptoms, and to evaluate the effectiveness of sleep-focused interventions on both sleep and PG symptoms.

Since the systematic review by Lancel et al. (2020), PGD has been formally recognized as a distinct diagnosis in the DSM-5-TR (APA, 2022). The diagnostic inclusion of PGD in this diagnostic handbook, together with the research gaps highlighted in the previous review, may have stimulated increased empirical attention toward the temporal relationship between sleep problems and grief as well as the efficacy of grief- and sleep-focused interventions on sleep and PG symptoms, respectively. For instance, Sveen et al. (2021) conducted a randomized controlled trial of guided internet-delivered CBT-I in bereaved parents, demonstrating long-term reductions in PG symptoms. As another example, de Lang et al. (2023) employed cross-lagged panel models to examine reciprocal associations between symptoms of PG, depression, and insomnia,

demonstrating that changes in insomnia symptoms predicted fluctuations in PG symptoms but not vice versa. These studies highlight the empirical advancement since the previous review, warranting an updated systematic review. Thus, the current review aims to answer the following research questions: (1) what are the temporal relationships between sleep problems and PG symptoms, and (2) do therapeutic interventions targeting sleep problems reduce symptoms of PG, and vice versa?

Methods

Reporting of this review follows the PRISMA 2020 guidelines, and the completed checklist is provided in Appendix A.

Pre-Registration

This systematic review was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO; Registration ID: 1166851), and all methods followed the registered protocol unless otherwise specified.

Eligibility Criteria

Studies were eligible for inclusion if they were peer-reviewed, English-language journal articles published from 2019 onward, to safeguard study quality, ensure interpretability, and capture new evidence that had emerged since the previous review, respectively. Samples had to consist of bereaved individuals and include at least 20 participants to ensure sufficient statistical power to detect very large effects, $r = .80$ (Cohen, 1988). Furthermore, studies needed to employ either longitudinal or intervention designs and report on quantitative data. Additionally, studies had to include both a sleep-related measure or intervention and a grief-related measure or intervention. For intervention studies specifically, inclusion required that the intervention targeted either sleep or grief and measured the other construct (i.e., grief if sleep was targeted, or

sleep if grief was targeted) as an outcome. Statistical analyses were required to address the research questions of the current review.

Search and Screening Strategy

The literature search was conducted in PsycINFO via EBSCO, Web of Science, and PubMed on 15 October 2025. The original search string from Lancel et al. (2020) was used for all database searches, which specifically consisted of the following search terms: grief OR mourning OR bereav∗ AND sleep∗ OR "insomnia" OR "sleep apnea" OR "snoring" OR "restless legs" OR "circadian disorder" OR "nightmare." A publication date limit from 2019 onward was applied in all searches. The search strategy was informally validated by confirming that four studies (i.e., de Feijter et al., 2021; de Lang et al., 2023, 2024; Sveen et al., 2021) known to meet the inclusion criteria were identified in the initial searches.

The literature search identified 692 records, all of which were imported into Covidence. Of these, 262 duplicates were automatically removed prior to study selection. The selection process was conducted in two stages. In the first stage, 430 titles and abstracts were screened for eligibility, resulting in the exclusion of 392 irrelevant records and twelve manually identified duplicates. In the second stage, the full texts of 26 potentially relevant papers were assessed. Of these papers, ten were found to meet the inclusion criteria. In this phase, three intervention studies (Huberty et al., 2020; Wang et al., 2025; Zhang et al., 2025) were excluded after careful deliberation. While a theoretical connection between the intervention and sleep or grief could be argued, the interventions themselves were not specific or established enough in directly targeting either sleep or grief, and therefore these studies did not meet our eligibility criteria. Furthermore, one study (Milic et al., 2019) was found to be already included in the review by Lancel et al. (2020) albeit it was not used to answer the research questions that are also relevant to the current

review. Nonetheless, it was decided that this study would be classified as identified via the previous review rather than the present search strategy. Reference lists of all included studies were reviewed for additional eligible records, but no further studies were identified. The nine newly identified studies, together with four relevant studies from the previous review (Lancel et al., 2020), resulted in a total of thirteen studies included in the current review. Both screening phases were conducted independently by two researchers. Any discrepancies in inclusion decisions were first resolved through discussion, and when consensus could not be reached, a third researcher was consulted to make a final decision. A PRISMA flowchart of the study selection procedure is presented in Figure 1.

Data Extraction

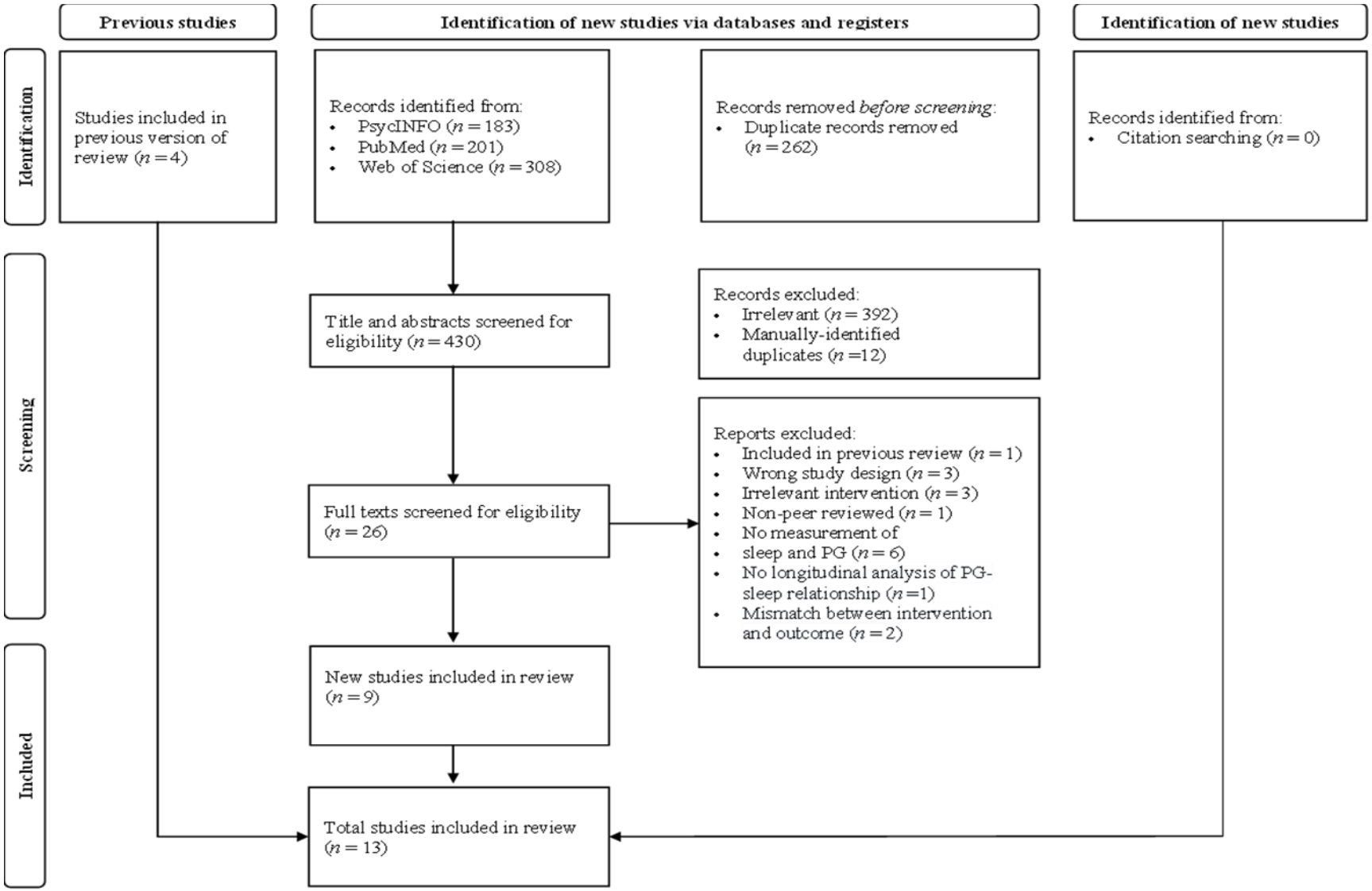
Extracted data was systematically tabulated in Excel by two researchers working independently. The percentage of initial agreement was 81.1%. The extracted information included bibliographic details; study design; recruitment strategy; sample characteristics (e.g., size, country, age, gender, and education level); loss-related characteristics (e.g., time since loss, relationship to the deceased, and cause of loss); measures of sleep and grief; the applied statistical analyses; the results pertaining to the current review's research questions. Similar to the screening process, any inconsistencies in the extracted information were discussed until consensus was reached. If agreement could not be reached, a third researcher was consulted.

Data Synthesis

A narrative synthesis approach was used to descriptively summarize the findings across studies. A meta-analysis was not performed due to the expected heterogeneity (e.g., in study designs, samples, measures, and analyses) among the included studies. Methods to explore statistical heterogeneity were not applied and sensitivity analyses were not conducted due to the

Figure 1

PRISMA Flowchart of Study Selection



lack of statistical synthesis. Summary statistics and effect estimates with measures of precision were still provided where available.

Bias Assessment and Quality Appraisal

The methodological quality of included studies was assessed using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018). The tool was applied independently by two reviewers, and any discrepancies were resolved through discussion. Neither risk-of-bias across studies nor the certainty-of-evidence was evaluated as these assessments require statistical synthesis, which was not performed in this narrative review.

Results

Study Characteristics

Appendix B presents the extracted data on the characteristics of the studies included in the current review. Cumulatively, the studies reported on approximately 2,210 bereaved participants. A definite total number of unique participants across studies cannot be established, as some studies recruited from shared research projects (e.g., de Lang et al., 2023, 2024), leading to potential participant overlap. In terms of design, the selected studies included six longitudinal observational studies (46%), five randomized controlled trials (38%), one partially randomized controlled trial (8%), and one non-randomized intervention study (8%).

PG symptoms were most frequently assessed using a version of the Inventory of Complicated Grief (ICG), used in ten studies (77%). Two studies (15%) included the Traumatic Grief Inventory Self-Report Plus (TGI-SR+), and one study (8%) reported on the Prolonged Grief Disorder-13 (PG-13). Subjective sleep was most commonly measured using the Pittsburgh Sleep Quality Index (PSQI) or the Insomnia Severity Index (ISI), used in six (46%) and five (38%) studies, respectively. Other sleep measures, each used in only one study, included: the

sleep disorders subscale of the Symptom Checklist-90 (SCL-90; 8%), four sleep items from the Quick Inventory of Depressive Symptomatology (QIDS; 8%), and one item from the PSQI (8%). Objective sleep measurement, actigraphy, was employed in only one study (8%). No studies used polysomnography.

Studies were conducted in five different countries. Of the thirteen studies, five studies originated from the Netherlands (38%), four from the USA (31%), two from South Korea (15%), and one study each from Germany (8%) and Sweden (8%). Across studies, the unweighted mean proportions indicated that 77% of participants were female and 32% were highly educated, and the unweighted mean age of the participants was 62.7 years. Regarding loss-characteristics, the unweighted mean time elapsed since the loss was approximately 2.4 years. Furthermore, the studies differed in cause of death and relationship to the deceased; where reported, natural death was the most common cause, and the majority of participants were bereaved partners.

Quality Appraisal

Table 1 presents the quality appraisal of the thirteen included studies using the MMAT. In line with the 2018 MMAT guidelines, no overall quality scores are reported; instead, detailed information is provided.

Within the MMAT, the six longitudinal observational studies (de Feijter et al., 2021; de Lang et al., 2023, 2024; Han et al., 2019; Lee et al., 2020; Milic et al., 2019) were classified as quantitative descriptive studies as these did not examine the effectiveness of an intervention. Although Milic et al. (2019) and de Feijter et al. (2021) are cohort studies that, according to the MMAT, should be categorized as quantitative non-randomized studies, they were not classified as such because they did not involve an intervention or exposure and therefore did not align well with the items.

Table 1

MMAT Quality Assessment of the Included Studies

Quantitative randomized controlled trials	Is randomization appropriately performed?	Are the groups comparable at baseline?	Are there complete outcome data?	Are outcome assessors blinded to the intervention provided?	Did the participants adhere to the assigned intervention?
Kaiser et al., 2022	Yes	Yes	No	No	Yes
Knowles et al., 2025	No	Yes	Yes	No	Yes
Sveen et al., 2021	Yes	No	No	Yes	No
Szuhany et al., 2020	Yes	No	No	Yes	No
Boelen & Lancee, 2013	Yes	Can't tell	No	Can't tell	Can't tell
Germain et al., 2006	Yes	Yes	No	Yes	No
Quantitative non-randomized studies	Are the participants representative of the target population	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Are there complete outcome data	Are the confounders accounted for in the design and analysis?	During the study period, is the intervention administered (or exposure occurred) as intended?
Knowles et al., 2017	No	Yes	Yes	Yes	Yes
Quantitative descriptive studies	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?
de Feijter et al., 2021	Yes	No	Yes	Yes	Yes
de Lang et al., 2023	Yes	No	Yes	No	Yes
de Lang et al., 2024	Yes	No	Yes	Can't tell	Yes
Han et al., 2019	Yes	Yes	Yes	Yes	No
Lee et al., 2020	Yes	Yes	Yes	No	No
Milic et al., 2019	Yes	No	Yes	Yes	Yes

The five randomized controlled trials (Boelen & Lancee, 2013; Germain et al., 2006; Kaiser et al., 2022; Sveen et al., 2021; Szuhany et al., 2020), as well as the partially randomized controlled trial (Knowles et al., 2025), were classed as quantitative randomized controlled trials. The partially randomized controlled trial was included in this category because it aligned more closely with the category's items, and its incomplete randomization could be acknowledged through the first item of this category. The non-randomized intervention study (Knowles et al., 2017) was categorized under quantitative non-randomized studies. Per the MMAT, this category includes studies that examine the effectiveness of an intervention or exposure without random allocation.

All included studies satisfied the criteria for the two screening items, namely the existence of clearly stated research questions and the collection of data appropriate to address those questions, and were therefore eligible for full appraisal according to design-specific criteria. Across the six quantitative descriptive studies, the sampling strategy, measurements, and statistical analyses employed were all appropriate for answering the research question(s). However, representativeness of the target population was insufficient in four studies, and the risk of nonresponse bias was unclear in one study or potentially high in two others. Among the six quantitative randomized controlled trials, randomization was appropriately performed in most studies, except for the partially randomized controlled trial. However, for most trials, outcome data were incomplete, and baseline comparability between groups, blinding of outcome assessors, and participant adherence to the assigned intervention were lacking or unclear. For the quantitative non-randomized study, measurements, outcome data, confounder control, and intervention administration were all appropriate, but the participants were not representative of the target population.

Main Findings

All studies were identified as relevant to understanding the temporal relationship between sleep disturbances and PG symptoms. However, several studies (i.e., Boelen & Lancee, 2013; Germain et al., 2006; Kaiser et al., 2022; Knowles et al., 2017, 2025; Milic et al., 2019; Sveen et al., 2021; Szuhany et al., 2020) are intervention trials. As such, they are also relevant to the second research question concerning treatment efficacy. Consistent with the approach taken by Lancel et al. (2020), these studies are therefore discussed in the section on treatment efficacy. The remaining studies (i.e., de Feijter et al., 2021; de Lang et al., 2023, 2024; Han et al., 2019; Lee et al., 2020) address only the first research question and are accordingly reported in the section on temporal relationships.

Research Question 1: Temporal Relationship

The included studies examined the temporal relationship between sleep disturbances and PG symptoms in three main ways: (1) bidirectional prediction, (2) PG symptoms predicting subsequent sleep disturbances, and (3) sleep disturbances predicting subsequent PG symptoms. Among the studies examining the bidirectional relationship, de Lang et al. (2023) used random-intercept cross-lagged panel models across three waves, and found that changes in insomnia predicted subsequent changes in PG symptoms, whereas the reverse was not observed. A small-sampled study by Lee et al. (2020) found that baseline insomnia symptoms did not significantly predict PG symptoms, and vice versa, in bereaved individuals from the Sewol ferry disaster at 2-year follow-up.

On whether sleep difficulties predict subsequent PG symptoms, de Feijter et al. (2021) found in a prospective, population-based cohort study with a mean follow-up of six years that poor sleep at baseline was associated with higher odds of developing PG symptoms at follow-up.

Notably, this association did not remain significant after adjusting for baseline depressive symptoms. In another small-sampled study of bereaved individuals from the Sewol ferry disaster, Han et al. (2019) reported that changes in insomnia symptoms did not significantly predict changes in PG symptoms over a period of a year, and baseline insomnia symptoms did not predict PG symptoms at 1-year follow-up.

Using the same population-based cohort as de Feijter et al. (2021), Milic et al. (2019) examined the unidirectional predictive effect of PG symptoms on sleep problems, and reported that grief status ("normal" vs. "complicated grief") was not associated with changes in sleep duration or quality over time. Among participants within one year of bereavement, de Lang et al. (2024) identified three distinct trajectories of insomnia symptoms: resilient (47%), recovering (43%), and chronic (10%). More severe baseline PG symptoms were associated with a higher likelihood of belonging to the chronic insomnia trajectory. Furthermore, probable PGD (i.e., a score of 70 or higher on the TGI-SR+ at the last time point) at one-year follow-up was most prevalent in the chronic insomnia group.

Research Question 2: Treatment Efficacy

Among participants experiencing PG as established through a clinical interview, Boelen and Lancee (2013) found that CBT techniques reduced sleep difficulties from pre- to post-treatment. However, the majority of participants continued to report clinically significant sleep difficulties at post-treatment, which did not differ by remission status. Germain et al. (2006) tested whether CGT was more effective than interpersonal therapy in improving sleep quality when treating PG. Results showed that generally sleep quality improved from pre- to post-treatment, but there was a significant interaction effect between treatment type, responder status, and time; improvements were greatest among CGT responders, relative to responders in the

interpersonal therapy condition and to nonresponders in either treatment. Few participants met the threshold (i.e., a score of ≤ 5 on the PSQI) for clinically meaningful sleep improvement at post-treatment. Thus, similar to Boelen and Lancee (2013), residual sleep problems remained after treatment. Knowles et al. (2017) found that grief interventions delivered via virtual reality or a website improved sleep quality and reduced PG symptoms, but these improvements did not differ between groups over time. Szuhany et al. (2020) randomized participants to one of the following treatment conditions: CGT with placebo, CGT with citalopram, citalopram alone, or placebo alone. Overall, sleep disturbance and quality significantly improved from pre-treatment to follow-up. Additionally, CGT with citalopram resulted in significantly lower sleep disturbance than citalopram alone at endpoint, while other group comparisons were nonsignificant. Furthermore, mid-treatment sleep disturbance predicted subsequent PG symptoms, although this effect was attenuated when controlling for mid-treatment PG symptoms. Kaiser et al. (2022) tested online CBT in bereaved adults and found that sleep quality did not improve in either the treatment or waitlist control group, nor relative to each other, over time. Knowles et al. (2025) similarly found that sleep quality did not improve over time in the mindfulness, progressive muscle relaxation, or control conditions, and there was no significant interaction between condition and time.

One small randomized controlled trial reported on a sleep-focused intervention that included PG symptoms as an outcome. Specifically, Sveen et al. (2021) tested the efficacy of CBT-I relative to an active control in treating insomnia symptoms and other psychiatric symptoms, including PG symptoms, within a bereaved sample. Both groups showed significant reductions in PG symptoms from pre-treatment to 18-month follow-up. At the 18-month follow-

up, the CBT-I group had significantly lower PG scores than the control group. However, notably, there was no significant interaction between the two conditions over time.

Discussion

The purpose of the current systematic review was to update and extend previous findings on the relationship between sleep problems and PG symptoms. Specifically, this review sought to address critical gaps identified by Lancel et al. (2020), who highlighted the lack of longitudinal and intervention research examining the bidirectional relationship between PG symptoms and sleep problems. By narratively synthesizing the current evidence base, the present review aimed to clarify (1) the temporal relationships between sleep problems and PG symptoms, and (2) whether interventions targeting sleep problems reduce PG symptoms, and vice versa. This updated review provides a more comprehensive understanding of whether sleep problems and PG symptoms may predict one another and the extent to which sleep- or grief-focused interventions may influence PG symptoms or sleep, respectively.

Regarding the temporal relationship between sleep difficulties and PG symptoms, study findings were mixed and varied dependent on the temporal direction of effects that were examined. Two studies reported that sleep disturbances predicted subsequent PG symptoms. One tested the association bidirectionally and found that experiencing more insomnia symptoms after the loss predicted higher PG symptoms six months later, whereas PG symptoms did not predict later sleep disturbances (de Lang et al., 2023). In contrast, insomnia symptoms and depressive symptoms did show a reciprocal relationship over time. The other study examined only the pathway from sleep disturbances to PG symptoms, and found that more severe sleep disturbances prior to the loss predicted greater PG symptoms six years later. However, this significant relationship was explained by baseline depressive symptoms (de Feijter et al., 2021). One study

examined solely the pathway from PG symptoms to sleep disturbances and found evidence that higher baseline PG symptoms predicted higher future sleep disturbances over the course of a year (de Lang et al., 2024). However, baseline depressive symptoms explained the effects of PG symptoms on insomnia symptoms. Additionally, it found that probable PGD was most prevalent in the chronic insomnia group at 1-year follow-up, followed by the recovering group, and least prevalent in the resilient group. Three other studies found no significant predictive relationships, one tested the bidirectional relationship at 1-year follow-up (Lee et al., 2020), one examined the effect of sleep disturbances on PG symptoms at 2-year follow-up (Han et al., 2019), and one the effect of PG symptoms on sleep disturbances at a mean 6-year follow-up (Milic et al., 2019); however, two of these studies had small samples for a longitudinal design and may have been underpowered to detect the effects under investigation.

Taken together, the current evidence base, while mixed, provides more consistent support for sleep disturbances as a predictor of PG symptoms than for the reverse effect. Furthermore, depressive symptoms may play an important role in the relationship between sleep problems and PG symptoms, as in research examining the effect of sleep disturbances on PG symptoms as well as research examining the effect of PG symptoms on sleep disturbances, significant relationships were explained by depressive symptoms. This finding may be explained by considering the conceptual overlap between PGD and MDD. Although distinct disorders, PGD and MDD do have shared symptomatology. To illustrate, sadness and guilt are included in the diagnostic criteria of PGD as defined in the ICD-11 and of MDD as defined in both the ICD-11 and DSM-5 (APA, 2022; WHO, 2019). Additionally, severe symptoms of PG and MDD frequently co-occur, with a meta-analysis estimating co-occurrence in 63% of cases (Komischke-Konnerup et al., 2021). The overlap between PGD and MDD may reflect shared transdiagnostic

mechanisms that contribute to various psychiatric disorders (Eisma & Stroebe, 2021; Hernández-Posadas et al., 2024). For example, the role of depression may be understood through the same theoretical explanations of the mechanisms underlying the relationship between insomnia symptoms and PG symptoms; fragmented REM sleep, a hallmark of insomnia (Riemann et al., 2012), can impair emotional processing, which may worsen depressive symptoms (Walker & van der Helm, 2009; Goldstein & Walker, 2014). Furthermore, depression following bereavement may contribute to insomnia through attentional biases toward negative events, particularly negative sleep experiences, heightening nighttime worry and hyperarousal that delay sleep onset (Espie et al., 2006). Additionally, reduced physical activity during depression may lower sleep pressure, further exacerbating insomnia symptoms (van Gool, 2003; Yang et al., 2017).

With respect to treatment efficacy, the majority of grief-focused intervention trials did not observe significant differences in sleep between treatment and control groups over time (Kaiser et al., 2022; Knowles et al., 2017, 2025; Szuhany et al., 2020). However, one study did reveal a significant interaction effect that indicated sleep improvements were contingent on treatment condition and responder status over time (Germain et al., 2006). Additionally, two studies showed that despite within-group improvements in sleep during grief-focused psychotherapy, clinically significant sleep disturbances often persisted (Boelen & Lancee, 2013; Germain et al., 2006). There was only one study included that examined whether a sleep-focused intervention could reduce PG symptoms (Sveen et al., 2021). Although this small randomized controlled trial found a large between-group difference at the 18-month follow-up, it failed to find a significant interaction effect that indicated groups differed over time. Thus, the significant between-group effect should be interpreted with caution. In conclusion, grief-focused interventions do not appear to reliably improve sleep over time compared to other treatment

conditions, and clinically significant sleep disturbances often persist. Furthermore, the current evidence base provides insufficient data to draw conclusions about the efficacy of sleep-focused interventions for reducing PG symptoms.

Limitations and Implications

Several limitations of the included studies should be considered when interpreting the findings of this review. First, there was heterogeneity in study design, including type of study, sample size, degree of randomization, statistical analyses, and use of validated measures. This variability may have limited the certainty of evidence and the comparability of results. Second, the assessment of sleep outcomes was largely based on self-report measures, with only one study employing actigraphy and none using polysomnography. The reliance on subjective sleep assessments increases the risk of reporting bias and limits conclusions regarding objective sleep disturbances. Moreover, some studies used measures with unclear psychometric validity (e.g., one item measures), which may further compromise the accuracy of reported outcomes. Third, the representativeness of study samples was limited. Most studies predominantly included female, upper middle-aged bereaved adults. Although this gender and age distribution is common in bereaved samples (Eisma & Stroebe, 2021), it potentially restricts the generalizability of findings. Finally, most studies did not include clinical interviews. The absence of clinician-administered assessments limits the ability to confirm diagnostic status and differentiate insomnia and PG symptoms from other psychiatric conditions. Reliance on self-report measures may therefore have introduced misclassification bias and reduced the clinical validity of the findings. Similarly, most studies assessed PG symptoms using older measures that do not fully align with the current diagnostic conceptualizations of PGD in the ICD-11 and DSM-5-TR (Treml et al., 2020; Lenferink et al., 2022). Consequently, none of the included

studies provided information on participants' diagnostic status according to contemporary PGD criteria. This limits the ability to draw conclusions about sleep disturbances specifically among individuals meeting current diagnostic thresholds for PGD.

The current review also has limitations that should be acknowledged. First, the literature search was restricted to peer-reviewed articles published in English. This may have resulted in the exclusion of relevant studies published in other languages or in the grey literature. Second, a meta-analysis was not conducted due to the expected heterogeneity in study designs, samples, measures, and statistical analyses among the studies. As a result, the findings are summarized by using a narrative synthesis, which limits the ability to quantify effect sizes and draw definitive conclusions about the magnitude of associations between PG symptoms and sleep.

Conclusion

The current review aimed to summarize evidence regarding the temporal relationships between PG symptoms and sleep problems, and the treatment efficacy of sleep- and grief-focused interventions on PG symptoms and sleep, respectively. The evidence for temporal relationships between sleep problems and PG symptoms is mixed, but higher-quality studies tentatively suggest that sleep problems may predict increases in PG symptoms; however, this relationship may be better explained by depressive symptoms. Most grief-focused intervention studies did not demonstrate improvements in sleep between treatment groups over time. Only one small randomized controlled trial testing the effects of a sleep-focused intervention on PG symptoms, which, despite large between-group differences in favor of the intervention group at 18-month follow-up, failed to find a significant interaction effect. One study is insufficient to draw conclusions about the treatment efficacy of sleep-focused interventions on PG symptoms. Therefore, more high-quality studies on sleep-focused interventions measuring PG as an

outcome are needed. Furthermore, future research should employ longitudinal and interventional designs that utilize validated measures, incorporate objective measures of sleep, use PG instruments aligned with ICD-11 or DSM-5-TR criteria, and prioritize including currently underrepresented groups as well as clinical samples.

References

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

Arrindell, W. A., & Ettema, J. H. M. (2003). *SCL-90: Handleiding bij een multidimensionele psychopathologie-indicator*. Swets Test Publishers.

Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, *2*(4), 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4

Boelen, P. A., & Lancee, J. (2013). Sleep difficulties are correlated with emotional problems following loss and residual symptoms of effective prolonged grief disorder treatment. *Depression Research and Treatment*, *2013*(1), 739804. https://doi.org/10.1155/2013/739804

Boelen, P. A., & Prigerson, H. G. (2007). The influence of symptoms of prolonged grief disorder, depression, and anxiety on quality of life among bereaved adults: A prospective study. *European Archives of Psychiatry and Clinical Neuroscience, 257*(8), 444–452. https://doi.org/10.1007/s00406-007-0744-0

Boelen, P. A., de Keijser, J., van den Hout, M. A., & van den Bout, J. (2007). Treatment of complicated grief: A comparison between cognitive-behavioral therapy and supportive counseling. *Journal of Consulting and Clinical Psychology*, *75*(2), 277. https://doi.org/10.1037/0022-006X.75.2.277

Boelen, P. A., Van den Bout, J., De Keijser, J., & Hoijtink, H. (2003). Reliability and validity of the Dutch version of the Inventory of Traumatic Grief (ITG). *Death Studies, 27*(3), 227–247. https://doi.org/10.1080/07481180302889

Burke, L. A., & Neimeyer, R. A. (2012). Prospective risk factors for complicated grief: A review of the empirical literature. In M. S. Stroebe, H. Schut, & J. van der Bout (Eds.), *Complicated grief: Scientific foundations for healthcare professionals* (pp. 145–161). Routledge.

Buysse, D. J., Reynolds, C. F., III, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, *28*(2), 193–213. https://doi.org/10.1016/0165-1781(89)90047-4

Cho, Y. W., Song, M. L., & Morin, C. M. (2014). Validation of a Korean version of the Insomnia Severity Index. *Journal of Clinical Neurology, 10*(3), 210–215. https://doi.org/10.3988/jcn.2014.10.3.210

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

de Feijter, M., O'Connor, M.-F., Arizmendi, B. J., Ikram, M. A., & Luik, A. I. (2021). The longitudinal association of actigraphy-estimated sleep with grief in middle-aged and elderly persons. *Journal of Psychiatric Research, 137*, 66–72. https://doi.org/10.1016/j.jpsychires.2021.02.042

de Lang, T. A., Buyukcan-Tetik, A., de Jong, P. J., Lancel, M., & Eisma, M. C. (2023). Cross-lagged analyses of prolonged grief and depression symptoms with insomnia symptoms. *Behavior Therapy, 54*(3), 510–523. https://doi.org/10.1016/j.beth.2022.12.004

de Lang, T. A., Buyukcan-Tetik, A., de Jong, P. J., Lancel, M., & Eisma, M. C. (2024). Trajectories of insomnia following bereavement. *Sleep Medicine*, *114*, 159–166. https://doi.org/10.1016/j.sleep.2023.12.009

Derogatis, L. R. (1977). *SCL-90: Administration, scoring and procedures manual-I for the revised version and other instruments of the psychopathology rating scale series*. Johns Hopkins University School of Medicine.

Doering, B. K., & Eisma, M. C. (2016). Treatment for complicated grief: State of the science and ways forward. *Current Opinion in Psychiatry*, *29*(5), 286–291. https://doi.org/10.1097/YCO.0000000000000263

Eisma, M. C., & Stroebe, M. S. (2021). Emotion regulatory strategies in complicated grief: A systematic review. *Behavior Therapy, 52*(1), 234–249. https://doi.org/10.1016/j.beth.2020.04.004

Espie, C. A., Broomfield, N. M., MacMahon, K. M. A., Macphee, L. M., & Taylor, L. M. (2006). The attention-intention-effort pathway in the development of psychophysiologic insomnia: A theoretical review. *Sleep Medicine Reviews, 10*(4), 215–245. https://doi.org/10.1016/j.smrv.2006.03.002

Gee, B., Orchard, F., Clarke, E., Joy, A., Clarke, T., & Reynolds, S. (2019). The effect of non-pharmacological sleep interventions on depression symptoms: A meta-analysis of randomised controlled trials. *Sleep Medicine Reviews, 43*, 118–128. https://doi.org/10.1016/j.smrv.2018.09.004

Germain, A., Shear, K., Monk, T. H., Houck, P. R., Reynolds, C. F., III, Frank, E., & Buysse, D. J. (2006). Treating complicated grief: Effects on sleep quality. *Behavioral Sleep Medicine*, *4*(3), 152–163. https://doi.org/10.1207/s15402010bsm0403_2

Goldstein, A. N., & Walker, M. P. (2014). The role of sleep in emotional brain function. *Annual Review of Clinical Psychology, 10*, 679–708. https://doi.org/10.1146/annurev-clinpsy-032813-153716

Han, D. H., Lee, J. J., Moon, D. S., Cha, M. J., Kim, M. A., Min, S., Yang, J. H., Lee, E. J., Yoo, S. K., & Chung, U. S. (2016). Korean version of the Inventory of Complicated Grief scale: Psychometric properties in Korean adolescents. *Journal of Korean Medical Science, 31*(1), 114–119. https://doi.org/10.3346/jkms.2016.31.1.114

Han, H., Yun, J. A., Huh, H. J., Huh, S., Hwang, J., Joo, J. Y., Yoon, Y. A., Shin, E. G., Choi, W. J., Lee, S., & Chae, J. H. (2019). Posttraumatic symptoms and change of complicated grief among bereaved families of the Sewol ferry disaster: One year follow-up study. *Journal of Korean Medical Science*, *34*(28), e194. https://doi.org/10.3346/jkms.2019.34.e194

Hardison, H. G., Neimeyer, R. A., & Lichstein, K. L. (2005). Insomnia and complicated grief symptoms in bereaved college students. *Behavioral Sleep Medicine*, *3*(2), 99–111. https://doi.org/10.1207/s15402010bsm0302_4

Hernández-Posadas, A., Lommen, M. J. J., de la Rosa Gómez, A., Bouman, T. K., Mancilla-Díaz, J. M., & del Palacio González, A. (2024). Transdiagnostic factors in symptoms of depression and post-traumatic stress: A systematic review. *Current Psychology, 43*, 5933–5948. https://doi.org/10.1007/s12144-023-04792-x

Hertenstein, E., Feige, B., Gmeiner, T., Kienzler, C., Spiegelhalder, K., Johann, A., Jansson-Fröjmark, M., Palagini, L., Rücker, G., Riemann, D., & Baglioni, C. (2019). Insomnia as a predictor of mental disorders: A systematic review and meta-analysis. *Sleep Medicine Reviews, 43*, 96–105. https://doi.org/10.1016/j.smrv.2018.10.006

Ho, F. Y.-Y., Chan, C. S., & Tang, K. N.-S. (2016). Cognitive-behavioral therapy for sleep disturbances in treating posttraumatic stress disorder symptoms: A meta-analysis of

randomized controlled trials. *Clinical Psychology Review, 43*, 90–102. https://doi.org/10.1016/j.cpr.2015.09.005

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., & Vedel, I. (2018). *Mixed Methods Appraisal Tool (MMAT) version 2018: User guide*. McGill University. http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/fetch/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf

Huberty, J., Sullivan, M., Green, J., Kurka, J., Leiferman, J., Gold, K., & Cacciatore, J. (2020). Online yoga to reduce post traumatic stress in women who have experienced stillbirth: A randomized control feasibility trial. *BMC Complementary Medicine and Therapies, 20*(1), 1–12. https://doi.org/10.1186/s12906-019-2805-0

Johannsen, M., Damholdt, M. F., Zachariae, R., Lundorff, M., Farver-Vestergaard, I., & O'Connor, M. (2019). Psychological interventions for grief in adults: A systematic review and meta-analysis of randomized controlled trials. *Journal of Affective Disorders*, *253*, 69–86. https://doi.org/10.1016/j.jad.2019.04.065

Kaiser, J., Nagl, M., Hoffmann, R., Linde, K., & Kersting, A. (2022). Therapist-assisted web-based intervention for prolonged grief disorder after cancer bereavement: Randomized controlled trial. *JMIR Mental Health*, *9*(2), e27642. https://doi.org/10.2196/27642

Knowles, L. M., Kaplan, D. M., Flores, M., Friedman, S. E., & O'Connor, M.-F. (2025). Mindfulness and relaxation interventions reduce depression, negative affect and stress in widow(er)s. *Journal of Loss and Trauma*, 1–24. https://doi.org/10.1080/15325024.2025.2504951

Knowles, L. M., Stelzer, E. M., Jovel, K. S., & O'Connor, M.-F. (2017). A pilot study of virtual support for grief: Feasibility, acceptability, and preliminary outcomes. *Computers in Human Behavior*, *73*, 650-658. https://doi.org/10.1016/j.chb.2017.04.005

Komischke-Konnerup, K. B., Zachariae, R., Johannsen, M., Nielsen, L. D., & O'Connor, M. (2021). Co-occurrence of prolonged grief symptoms and symptoms of depression, anxiety, and posttraumatic stress in bereaved adults: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, *4*, 100140. https://doi.org/10.1016/j.jadr.2021.100140

Lancel, M., Boersma, G. J., & Kamphuis, J. (2021). Insomnia disorder and its reciprocal relation with psychopathology. *Current Opinion in Psychology*, *41*, 34–39. https://doi.org/10.1016/j.copsyc.2021.02.001

Lancel, M., Stroebe, M., & Eisma, M. C. (2020). Sleep disturbances in bereavement: A systematic review. *Sleep Medicine Reviews, 53*, 101331. https://doi.org/10.1016/j.smrv.2020.101331

Latham, A. E., & Prigerson, H. G. (2004). Suicidality and bereavement: Complicated grief as psychiatric disorder presenting greatest risk for suicidality. *Suicide and Life-Threatening Behavior, 34*(4), 350–362. https://doi.org/10.1521/suli.34.4.350.53737

Lee, S. H., Seo, Y. E., Kim, K. B., Noh, J. W., & Kim, E. J. (2020). Long-term risks of complicated grief and insomnia in student survivors of the Sewol ferry disaster in South Korea: A four-year observational follow-up study. *The Ethiopian Journal of Health Development*, *34*(Special 3).

Lenferink, L. I. M., Eisma, M. C., Smid, G. E., de Keijser, J., & Boelen, P. A. (2022). Valid measurement of DSM-5 persistent complex bereavement disorder and DSM-5-TR and

ICD-11 prolonged grief disorder: The Traumatic Grief Inventory–Self Report Plus (TGI-SR+). *Comprehensive Psychiatry, 112*, 152281. https://doi.org/10.1016/j.comppsych.2021.152281

Lumbeck, G., Brandstätter, M., & Geissner, E. (2012). Erstvalidierung der deutschen Version des "Inventory of Complicated Grief" (ICG-D). *Zeitschrift für Klinische Psychologie und Psychotherapie, 41*(4), 243–248. https://doi.org/10.1026/1616-3443/a000172

Milic, J., Saavedra Perez, H., Zuurbier, L. A., Boelen, P. A., Rietjens, J. A., Hofman, A., & Tiemeier, H. (2019). The longitudinal and cross-sectional associations of grief and complicated grief with sleep quality in older adults. *Behavioral Sleep Medicine*, *17*(1), 31–40. https://doi.org/10.1080/15402002.2016.1276016

Monk, T. H., Germain, A., & Reynolds, C. F., III. (2008). Sleep disturbance in bereavement. *Psychiatric Annals, 38*(10), 671–675. https://doi.org/10.3928/00485713-20081001-06

Nakajima S. (2018). Complicated grief: Recent developments in diagnostic criteria and treatment. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 373*(1754), 20170273. https://doi.org/10.1098/rstb.2017.0273

Norman, G. R., Sloan, J. A., & Wyrwich, K. W. (2003). Interpretation of changes in health-related quality of life: The remarkable universality of half a standard deviation. *Medical Care, 41*(5), 582–592. https://doi.org/10.1097/00005650-200305000-00004

Ohayon, M. M. (2002). Epidemiology of insomnia: What we know and what we still need to learn. *Sleep Medicine Reviews, 6*(2), 97–111. https://doi.org/10.1053/smrv.2002.0186

Pohlkamp, L., Kreicbergs, U., Prigerson, H. G., & Sveen, J. (2018). Psychometric properties of the Prolonged Grief Disorder-13 (PG-13) in bereaved Swedish parents. *Psychiatry Research, 267*, 560–565. https://doi.org/10.1016/j.psychres.2018.06.004

Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale, consensus criteria, and a preliminary empirical test. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 613–646). American Psychological Association.

Prigerson, H. G., Horowitz, M. J., Jacobs, S. C., Parkes, C. M., Aslan, M., Goodkin, K., & Maciejewski, P. K. (2009). Prolonged grief disorder: Psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Medicine, 6*(8), e1000121. https://doi.org/10.1371/journal.pmed.1000121

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

Riemann, D., Spiegelhalder, K., Feige, B., Voderholzer, U., Berger, M., Perlis, M., & Nissen, C. (2010). The hyperarousal model of insomnia: A review of the concept and its evidence. *Sleep Medicine Reviews, 14*(1), 19–31. https://doi.org/10.1016/j.smrv.2009.04.002

Riemann, D., Spiegelhalder, K., Nissen, C., Hirscher, V., Baglioni, C., & Feige, B. (2012). REM sleep instability – A new pathway for insomnia? *Pharmacopsychiatry, 45*(5), 167–176. https://doi.org/10.1055/s-0031-1299721

Rush, A. J., Trivedi, M. H., Ibrahim, H. M., Carmody, T. J., Arnow, B., Klein, D. N., & Keller, M. B. (2003). The 16-item Quick Inventory of Depressive Symptomatology (QIDS), Clinician rating (QIDS-C), and Self-Report (QIDS-SR): A psychometric evaluation in patients with chronic major depression. *Biological Psychiatry, 54*(5), 573–583. https://doi.org/10.1016/S0006-3223(02)01866-8

Shear, M. K. (2010). Complicated grief treatment: The theory, practice and outcomes. *Bereavement Care*, *29*(3), 10–14. https://doi.org/10.1080/02682621.2010.522373

Spielman, A. J., Saskin, P., & Thorpy, M. J. (1987). Treatment of chronic insomnia by restriction of time in bed. *Sleep*, *10*(1), 45–56.

Sveen, J., Jernelöv, S., Pohlkamp, L., Kreicbergs, U., & Kaldo, V. (2021). Feasibility and preliminary efficacy of guided internet-delivered cognitive behavioral therapy for insomnia after the loss of a child to cancer: Randomized controlled trial. *Internet Interventions*, *25*, 100409. https://doi.org/10.1016/j.invent.2021.100409

Szuhany, K. L., Young, A., Mauro, C., Garcia de la Garza, A., Spandorfer, J., Lubin, R., Skritskaya, N. A., Hoeppner, S. S., Li, M., Pace-Schott, E., Zisook, S., Reynolds, C. F., Shear, M. K., & Simon, N. M. (2020). Impact of sleep on complicated grief severity and outcomes. *Depression and Anxiety, 37*(1), 73–80. https://doi.org/10.1002/da.22929

Treml, J., Kaiser, J., Plexnies, A., & Kersting, A. (2020). Assessing prolonged grief disorder: A systematic review of assessment instruments. *Journal of Affective Disorders*, *274*, 420–434. https://doi.org/10.1016/j.jad.2020.05.049

van Gool, C. H. (2003). Relationship between changes in depressive symptoms and unhealthy lifestyles in late middle aged and older persons: Results from the longitudinal aging study Amsterdam. *Age and Ageing, 32*(1), 81–87. https://doi.org/10.1093/ageing/32.1.81

Walker, M. P., & van der Helm, E. (2009). Overnight therapy? The role of sleep in emotional brain processing. *Psychological Bulletin, 135*(5), 731–748. https://doi.org/10.1037/a0016570

Wang, A., Zhang, W., Li, H., Guo, Y., Yu, N. X., & Zhang, J. (2025). An 8-week community-based resilience group intervention for Chinese parents who lost their only child: A two-

armed pragmatic waitlist-control trial. *Psychological Trauma: Theory, Research, Practice, and Policy, 17*(1), 225–234. https://doi.org/10.1037/tra0001670

Wassing, R., Benjamins, J. S., Talamini, L. M., Schalkwijk, F., & van Someren, E. J. W. (2019). Overnight worsening of emotional distress indicates maladaptive sleep in insomnia. *Sleep, 42*(1), 1–8. https://doi.org/10.1093/sleep/zsy268

World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). https://icd.who.int/

Xiu, D., Maercker, A., Woynar, S., Geirhofer, B., Yang, Y., & Jia, X. (2016). Features of prolonged grief symptoms in Chinese and Swiss bereaved parents. *Journal of Nervous and Mental Disease, 204*(9), 693–701. https://doi.org/10.1097/NMD.0000000000000539

Yang, Y., Shin, J. C., Li, D., & An, R. (2017). Sedentary behavior and sleep problems: A systematic review and meta-analysis. *International Journal of Behavioral Medicine, 24*(4), 481–492. https://doi.org/10.1007/s12529-016-9609-0

Zhang, W., Wang, A., Li, H., Guo, Y., & Zhang, J. (2025). Group-based positive psychological intervention in bereaved Chinese parents: Randomized controlled trial. *Journal of Loss and Trauma*, 1–18. https://doi.org/10.1080/15325024.2025.2454512

Appendix A

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	7
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	7
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7, 8
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	8
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8, 9, Figure 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	9

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	9, Table 1
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	11
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	11
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	11, 12, 15-18, App. B
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	12, 14, Table 1
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	N/A
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			

Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	18-21
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	21, 22
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	22, 23
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N/A

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: **www.prisma-statement.org**.

Appendix B

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
Boelen & Lancee, 2013 (Netherlands)[a]	RCT (CR + ET vs ET + CR), longitudinal (T1 = BL, T2 = post-treatment)	43 bereaved, no non-bereaved	M_{age} = 43.9 (*SD* = 13.5); 77% female; Time since loss: *M* = 37.8 months (*SD* = 44.9); Participant lost: partner (26%), child (21%) or other relative (54%); Cause of death: unnatural (16%)	Sleep: Sleep disorders subscale of the Dutch SCL-90-R (3 items); Grief: ICG (19 items)	Both ICG (*d* = 1.07) & sleep difficulty (*d* = 0.60) scores decreased from pre- to post CBT treatment. PGD remission rate = 45%. In 65% sleep difficulty remained above reference mean value, indicating residual sleep problems. Decrease in sleep difficulties did not differ between remitted and non-remitted PG-patients.
de Feijter et al., 2021 (Netherlands)	Longitudinal (T1-T2: BL & mean 6-year FU)	255 bereaved (44 acute grief, 158 non-complicated grief, 53 complicated grief), 1,521 non-bereaved	Bereaved: M_{age} = 63.3 (*SD* not reported); 68% female; education not reported Non-bereaved: M_{age} = 61.5 (*SD* = 8.9); 52% female; Education not reported; Time since loss not reported; Participant lost: Partner (25%), Child (8%), Other (55%), >1 person (13%); Cause of loss not reported	Sleep: PSQI (19 items); Actigraphy; Grief: Dutch ICG (17 items)	Poor sleep at baseline was associated with increased odds of PG (vs. non-PG grief) after a mean follow-up of 6 years. The longitudinal associations of sleep with grief did not remain significant after correction for baseline depressive symptoms

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
de Lang et al., 2023 (Netherlands)	Longitudinal (T1 = BL, T2 = 6-month FU, T3 = 1-year FU)	343 bereaved, no non-bereaved	M_{age} = 54.0 (*SD* = 12.5); 88% female; 58% high education; Time since loss: *M* = 13.2 months (*SD* not reported); Participant lost: Partner (50%), Parent (30%), Sibling (5%), Child (12%), Other (4%); Cause of loss: Natural death (84%), Accident (5%), Suicide (8%), COVID-19 (3%)	Sleep: ISI (7 items); Grief: TGI-SR+ (22 items)	PG, depression and insomnia symptoms showed positive moderate to strong associations concurrently and longitudinally across all three data waves. Within a first random-intercept cross-lagged panel model, changes in insomnia symptoms predicted changes in PG symptoms but not vice versa.
de Lang et al., 2024 (Netherlands)	Longitudinal (T1 = BL, T2 = 6-month FU, T3 = 1-year FU)	220 bereaved, no non-bereaved	M_{age} = 51.8 (*SD* = 12.24); 89% female; 41% high education; Time since loss: *M* = 2.3 months (*SD* = 1.44); Participant lost: Partner (39%), Parent (41%), Sibling (6%), Child (10%), Other (4%); Cause of loss: Natural death (85%), Accident (3%), Suicide (7%), COVID-19 (5%)	Sleep: ISI (7 items); Grief: TGI-SR+ (22 items)	Three distinct trajectories were identified, characterized by a resilient, recovering, and chronic trajectory of insomnia symptoms. More severe baseline PG symptoms and depression symptoms were associated with a higher likelihood of belonging to the chronic vs recovering and recovering vs resilient insomnia trajectory. Baseline depression symptoms uniquely distinguished the three trajectories. Probable PGD at one-year follow-up was most common in the chronic insomnia trajectory, followed by the recovering and resilient trajectories. Insomnia and PG symptoms followed a simultaneous trajectory.
Germain et al., 2006 (USA)[a]	RCT (CBT vs. IPT), longitudinal	67 bereaved, no non-bereaved	M_{age} = 50.1 (*SD* = 12.4); 84% female; Time since	Sleep: PSQI (19 items);	Pretreatment PSQI & ICG scores did not differ between

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
	(T1 = BL, T2 = post-treatment)		loss: *M* = 4.3 years (*SD* = 5.9); Participant lost: spouse (30%), parent (24%), child (30%), sibling (4%), other relative (9%), other (3%); Cause of death = violent (36%)	Grief: ICG (19 items)	treatment completers & non-completers, nor between treatment responders & non-responders. PSQI declined in treatment responders, but not in non-responders. Only 7 responders had PSQI score ≤ 5 after treatment, indicating residual / persistent sleep problems in most. PSQI decrease in responders is attributable to CG-treatment and not to IPT.
Han et al., 2019 (South Korea)	Longitudinal (T1 = BL, T2 = 1-year FU)	56 bereaved, no non-bereaved	Age: 20-29 (7%), 30-39 (2%), 40-49 (48%), 50-59 (39%), 60-69 (4%); 61% female; 29% high education[b]; Time since loss: *M* = 18 months (*SD* not reported); Participant lost: Child (86%), Others (14%); Cause of loss: Accident (100%)	Sleep: Korean ISI (7 items); Grief: Korean ICG (16 items)	Change in insomnia severity over one year did not significantly relate to change in PG symptoms. Severity of insomnia at baseline also did not predict PG symptom change.
Kaiser et al., 2022 (Germany)	RCT (Online grief CBT vs. waitlist control), longitudinal (T1 = BL, T2 = post-treatment, T3 = 3-month FU, T4 = 6-month FU, T5 = 1-year FU)	87 bereaved, no non-bereaved	M_{age} = 47.3 (*SD* = 14.0); 83% female; 69% high education; Time since loss: *M* = 28.7 months (*SD* = 40.3); Participant lost: Parent (47%), child (10%), Spouse (35%), Sibling (3%), Other (5%); Cause of loss: Cancer (100%)	Sleep: PSQI (19 items); Grief: German ICG (19 items); Augmented ICG (22 items)[c]	The intervention group (vs. waitlist control) showed a large decrease in PGD symptoms but no change in sleep quality from pre to post treatment. There was no significant within-group change on sleep quality in the intervention group.

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
Knowles et al., 2017 (USA)[a]	Non-RCT (VR vs. GW), longitudinal (T1 = BL, T2 = post-treatment, T3 = 2-month FU)	30 bereaved, no non-bereaved	M_{age} = 67.2 (*SD* = 10.7); 70% female; Time since loss: *M* = 9.2 months (*SD* = 6.6); Participant lost: spouse/partner; Cause of loss not reported	Sleep: PSQI (19 items); Grief: ICG (19 items)	VR & GW support resulted in comparable reductions in CG symptoms & PSQI scores from T1 to T3. Within-group effects over time were only significant for the VR group (VR, ICG Cohen's d = .75, p = .001; GW, ICG Cohen's d = .52, p = .071; VR, PSQI Cohen's d = .60, p = .014; GW PSQI Cohen's d = .53, p = .062). No group x time interactions emerged on ICG or PSQI.
Knowles et al., 2025 (USA)	Partial RCT (MT vs. PMR vs. waitlist control), longitudinal (T1 = BL, T2 = post-treatment, T3 = 4- or 6-week FU)	94 bereaved, no non-bereaved	M_{age} = 67.5 (*SD* = 8.9); 79% female; Education not reported; Time since loss: *M* = 14.7 months (*SD* = 9.0); Participant lost: Partner (100%); Cause of loss not reported	Sleep: PSQI (19 items); Grief: ICG-R	No significant group differences for sleep quality over time.
Lee et al., 2020 (South Korea)	Longitudinal (T1 = BL, T2 = 2-year FU)	31 bereaved, no non-bereaved	*M* and *SD* of age not reported; 61% female; Education not reported; Time since loss: *M* = 27 months (*SD* not reported); Participant lost: 100% classmates/peers; Cause of loss: Accident (100%)	Sleep: ISI (7 items); Grief: ICG (19 items)	Univariate Poisson regression revealed T1 insomnia did not predict T2 PG (β = 0.050), and T1 PG did not predict T2 insomnia (β = 0.002).
Milic et al., 2019 (Netherlands)[a]	Longitudinal (T1 = BL, T2 = mean 6-year FU)	1,043 'grievers', 4,387 'non-grievers' Longitudinal: sleep quality sample: 521	'Grievers': M_{age} = 73.6 (*SD* not reported); 74% female; 11% high education; Time since loss not reported; Participant lost: Partner (41%), Child (13%), Parent (11%), Sibling (15%),	Sleep: PSQI (19 items); Grief: Dutch ICG (17 items)	Normal grief and PG were not associated with changes in sleep duration or sleep quality.

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
		'grievers' & 2482 'non-grievers' Longitudinal sleep duration sample: 635 'grievers' & 2876 'non-grievers'	Others (21%); Cause of loss not reported 'Non-grievers': M_{age} = 72.4 (*SD* = 7.7); 55% female; Education not reported		
Sveen et al., 2021 (Sweden)	RCT (CBT-I vs. active control), longitudinal (T1 = BL, T2 = post-treatment, T3 = 9-month FU, T4 = 18-month FU)	21 bereaved, no non-bereaved	M_{age} = 47.7 (*SD* not reported); 67% female; 43% high education; Time since loss: *M* = 2.9 years (*SD* not reported); Participant lost: Child (100%); Cause of loss: Cancer (100%)	Sleep: ISI (7 items); Grief: Swedish PG-13 (13 items)	The CBT-I group showed a significantly greater overall reduction in insomnia across all 4 timepoints compared to the control group. At the post-intervention assessment, the between-group effect size was very small and non-significant (*d* = 0.1). A significant between-group difference in favor of CBT-I emerged at the 9-month follow-up (*d* = -1.5), but was not sustained at the 18-month follow-up (*d* = -0.6). There was no statistically significant overall interaction effect between the groups over time for all secondary outcomes, except for anxiety. At the 18-month follow-up, the CBT-I group had significantly lower PG symptoms than the control group (*d* = -1.9). No significant between-group differences were found at post-intervention or the 9-month follow-up.

Study (Country)	Design	*n* (total bereaved; non-bereaved controls)	Sample characteristics	Measures	Relevant findings
Szuhany et al., 2020 (USA)	RCT (CGT + CIT vs. CIT; CGT+CIT vs. CGT+PLA; CIT vs. PLA; CGT+PLA vs. PLA), longitudinal (T1 = BL, T2 = mid-treatment, T3 = mid-treatment, T4 = post-treatment, T5 = 4-week FU)	395 bereaved, no non-bereaved	M_{age} = 53.0 (*SD* = 14.5); 78% female; 53% high education; Time since loss: *M* = 4.7 years (*SD* = 7.2); Participant lost: Spouse/Partner (37%), Partner (29%), Child (20%), Other (15%); Cause of loss not reported	Sleep: PSQI (1 item); QIDS (4 items); Grief: Clinical interview; ICG (19 items)	All treatment groups showed significant sleep improvement from baseline to endpoint. CGT + CIT was most effective for improving sleep, and it led to significantly lower sleep disturbance scores compared to CIT alone at endpoint. The comparisons between CGT+CIT vs CGT+PLA, CIT vs PLA, and CGT+PLA vs PLA were not significant. Mid-treatment sleep quality significantly predicted higher PG symptoms at endpoint. When controlled for mid-treatment PG symptoms, the predictive effect of mid-treatment sleep on PG symptoms became non-significant.

Note. General: BL = baseline; FU = follow-up. Sleep measures: PSQI = Pittsburgh Sleep Quality Index (Buysse et al., 1989); ISI = Insomnia Severity Index (Bastien et al., 2001; Korean version: Cho et al., 2014); QIDS = Quick Inventory of Depressive Symptomatology (Rush et al., 2003); SCL-90-R = Symptom Checklist-90-Revised (Derogatis, 1977; Dutch version: Arrindell & Ettema, 2003). Grief measures: ICG = Inventory of Complicated Grief (Prigerson et al., 1995; Dutch version: Boelen et al., 2003; German Version: Lumbeck et al., 2012; Korean version: Han et al., 2016); ICG-R = Inventory of Complicated Grief – Revised (Prigerson & Jacobs, 2001); TGI-SR+ = Traumatic Grief Inventory – Self Report Plus (Lenferink et al., 2022); PG-13 = Prolonged Grief Disorder – 13 (Prigerson et al., 2009; Swedish version: Pohlkamp et al., 2018). Treatment conditions: CBT-I = Cognitive Behavioral Therapy for Insomnia; CGT = Complicated Grief Therapy; CIT = Citalopram; PLA = Placebo; CR = Cognitive Restructuring; ET = Exposure Therapy; IPT = Interpersonal Psychotherapy; MT = Mindfulness Training; PMR = Progressive Muscle Relaxation; VR = Virtual Reality; GW = Grief Website.

[a] Indicates studies that were also included in the previous review.

[b] Percentages reported for college, university, and graduate school combined.

[c] The German ICG and the augmented ICG was used as the primary and as a secondary outcome, respectively. For the augmented ICG, three additional items adapted from Xiu et al. (2016) assessed guilt, difficulty accessing positive memories, and anhedonia to capture ICD-11 criteria of PGD.