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A Longitudinal Study
of PTSD in the Elderly Bereaved:
Prevalence and Predictors.

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Abstract.

Complicated grief reactions are relatively common following spousal bereavement. Old age spousal loss qualifies as a possible traumatic stressor, however, PTSD as a possible complication of the loss has rarely been explored in this population. This study aimed to investigate the frequency of PTSD in elderly bereaved people across the first 18 months of bereavement. Additionally, risk factors for the prediction of bereavement outcome in relation to four domains of the bereavement process were investigated.

Data was collected via self-report questionnaires measuring traumatic stress (HTQ), coping style (CSQ), crisis support (CSS), and personality (e.g. NEO-FFI). Elderly bereaved people (N=296, Mean=73 years) participated at two, six, 13, and 18 months post loss. The comparison group consisted of married elderly people who had experienced at least one significant loss (N=276, Mean=70 years).

The frequency of PTSD within the spousal bereaved group was high (16%) compared to the comparison group (4%) and remained stable across time. Each individual domain included in the current analysis was a predictor of PTSD 18 months post loss. Most predictors remained stable across time. A hierarchical regression analysis of the four domains predicted 49% of the variance, indicating a considerable overlap between the domains. Only one predictor, early posttraumatic distress, remained significant. The results confirm that loss of a spouse in old age is traumatic for some and that the effects of the loss remain over the first 18 months post loss. The results therefore underline the importance of further investigation into PTSD in the elderly bereaved.

Keywords: Old age bereavement, chronic PTSD, predictors of bereavement outcome, PTSD frequency.

Tables: 3, Figures: 1

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Prevalence and Predictors.

Bereavement and grief are widely explored processes that have occupied human minds for centuries. Recent studies indicate that most bereaved people, probably around 85%, go through a hard and demanding but natural process of grieving (Bonanno & Kaltman, 1999). Psychological interventions are not likely to minimize the psychological pain of the natural grieving process (Stroebe, Schut, & Stroebe, 2005). In some cases, psychological intervention with bereaved people when not required may even be harmful (Jordan & Neimeyer, 2003; Murphy et al., 1998; Neimeyer, 2000). However, complicated grief reactions such as depression, Posttraumatic Stress Disorder (PTSD), or anxiety disorders, have been identified in approximately 15% of the bereaved (Bonanno & Kaltman, 1999), and psychological interventions have been found effective with complicated grief reactions (e.g. Boelen, de Keijser, van den Hout, & van den Bout, 2007).

Despite the fact that death of a spouse qualifies as meeting the A1 criteria for PTSD as outlined by the DSM-IV (American Psychiatric Association, 1994), PTSD has rarely been studied in the elderly bereaved. Possibly attributable to the fact that the loss of a partner in later life has been considered a stressful life-event which does not approximate to a traumatic level (Averill & Beck, 2000). A number of research studies comprised of mainly elderly bereaved individuals found PTSD to be a relatively common reaction to loss with a frequency of 9-16% two to thirteen months after bereavement (Onrust & Cuijpers, 2006; Zisook, Chentsova-Dutton, & Shuchter, 1998). PTSD is related to serious physical and mental health problems and lower life satisfaction in the elderly, ultimately resulting in great expense for the health care services (Van Zelst, De Beurs, Beekman, Van Dyck, & Deeg, 2006). In many cases PTSD after bereavement turns into a chronic condition

almost always in combination with depression (Zisook et al., 1998). It is important to note that an overlap between bereavement related PTSD, depression, and Complicated Grief may indeed exist as a bereavement specific disorder. These issues have been discussed elsewhere (excluded reference for blinded version).

While chronic PTSD may be difficult to treat, PTSD which is diagnosed and treated early, for example, using prolonged exposure techniques as described by Foa, Henbree, & Rothbaum (2007) or Boelen et al. (2007) will most likely have a far better prognosis in terms of treatment outcomes. Despite the aforementioned, hardly any longitudinal research on PTSD in the elderly bereaved is available and little is known about the development of and predictors for PTSD across longer periods of time post loss.

Risk factors for psychological distress following bereavement

Many studies and theoretical works have investigated the effects of risk factors on the bereavement outcome (Stroebe & Schut, 2001). Unexpected deaths, previous psychiatric problems or traumatic events, recent major life events, low social support, insecure parental attachment, neuroticism, emotional coping, somatisation, overly dependent relationship to the deceased partner, and religious beliefs or other meaning systems have been found to be predictive of the bereavement outcome (Parkes 1992; Parkes, 1996; Zhang, El-Jawahri, & Prigerson, 2006). Coping style, adult attachment style, religious beliefs or other meaning systems, and unsatisfying social support were identified as some of the risk factors which held the strongest predictive ability (Bonanno et al., 2002; Ellifritt, Nelson, & Walsh, 2003; Kelly et al., 1999). In addition, emotional loneliness has been found to predict bereavement outcome after spousal loss (Stroebe, Stroebe, Abakoumkin, & Schut, 1996), and high initial distress has been found to be the most consistent risk factor for predicting long-term adverse bereavement outcomes (Kelly et al., 1999), while early posttraumatic

distress is considered to be a strong predictor of chronic PTSD (Brewin, 2005; Denson, Marshall, Schell, & Jaycox, 2007).

Recently, a model which suggests an integrative risk factor framework, which takes interactions between the domains of bereavement into consideration, has been proposed (Stroebe, Folkman, Hansson, & Schut, 2006). The framework of this integrative model allows for the prediction of the bereavement outcome by incorporating both risk and protective factors relating directly to the bereavement situation (e.g. traumatic circumstances about the death, multiple losses, problems with daily functioning), intrapersonal factors (e.g. personality traits, gender, intelligence, meaning systems), interpersonal factors (e.g. social support, family dynamics, isolation, religious practices), and factors of appraisal and coping (e.g. emotional regulation, coping styles). It is underlined that the domains are inter-linked, but suggestions as to how these domains interact and with what consequence still need to be addressed (*ibid.*). This model illustrates the complexity of bereavement reactions. In addition, the model can be regarded as helpful in terms of providing theoretical guidelines for clinical work and research. However, the level of complexity that the model represents is difficult to handle methodologically, both in relation to study designs and statistical analysis, making it difficult to test the model in full. In the following analysis risk factors will be referred to as predictors for bereavement outcome when used in relation to statistically based models and analysis.

This study aimed to investigate the frequency of PTSD and the stability of identified risk factors of PTSD across time following old age spousal bereavement. Additionally, this study aimed to investigate some of the aforementioned pathways targeting intrapersonal, interpersonal, appraisal and coping, and situational or bereavement related risk factors, as predictors of long term bereavement related PTSD. In an attempt to reduce the complexity of the model, two to three of the most predictive risk factors within each domain were selected for further investigation.

In sum, the objective of this study was: (a) to identify frequencies of PTSD and subclinical posttraumatic symptoms across four time points following old age spousal bereavement; (b) to investigate the stability of the selected risk factors across time; (c) to investigate risk factors for predicting long-term PTSD in the elderly bereaved.

Method

Study procedure

The full population of persons aged between 65-80 years, who lived in the county of Aarhus and lost their spouse during 2006 were contacted via the Danish Central Person Register (CPR) approximately eight weeks after the death of their spouse. The CPR is a national person registration system containing personal information regarding age, marital status, name of partner, place of residence etc. A comparison group of still married elderly people who were again identified via the CPR were also included in this study. Full information regarding the samples is reported elsewhere (c.f. references excluded for blinded version).

The design of the study was longitudinal with data collection occurring across four measurement points post loss: two months (T1) six months (T2), 13 months (T3), and 18 months (T4). Data collection with regards to the comparison group occurred at one measurement point. On average data collection for the comparison group occurred 13 months post loss.

Participants

At baseline two months post loss (T1) 296 elderly bereaved people (38% male) with a mean age of 73 years ($SD = 4.41$; range 65-81) participated in the study. In the non-response group 25% were male. This means that relatively more widowers than widows chose to participate in the study ($F(1,793) = 12.18$; $p = 0.001$; for more information see reference excluded for blinded version). On average, the participants had been married for 46 years ($SD = 10.47$; range 3-62) before the death of their spouse, they had a mean of eight years of public schooling ($SD = 1.56$; range 5-14), and three years ($SD = 2.55$; range 0-13) of further education. Ninety-five percent had children (mean = 2.7;

$SD = 1.24$; range 1-9). Twenty four percent lived in villages or rural settings, while 76% lived in urban settings. Eighty seven percent experienced a period of spousal illness preceding the death, and 83% of these had participated in the daily care of their spouse. Sixty six percent experienced a forewarning of death immediately before the death of their spouse. With the exception of relatively longer education in the widowers ($F(1,199) = 11.57$; $p < .001$) and relatively longer time married before the loss for the widows ($F(1,292) = 4.36$; $p < .04$) no significant differences according to gender were found

Two hundred and seventy six married elderly people were included as a comparison group. Respondents received and responded to a postal questionnaire. Respondents chose the loss as the most significant in their life-time. Due to the selection of still married elderly people of whom relatively more were male, a higher proportion of the participants in the comparison group compared to the bereaved group were male. The mean age was 70 years ($SD=4.02$; range 60-81).

Cases without any scores on individual items of the psychopathological scales were excluded from statistical analysis at baseline and each follow-up wave. In addition, cases with a large proportion of missing values were excluded, leaving $n=221$ at T2 (response rate = 72%), $n=187$ at T3 (response rate = 83%), and $n=184$ at T4 (response rate = 98%).

The Expectation Maximization (EM) algorithm, which has been demonstrated to be an effective method of dealing with missing data (Bunting, Adamson, & Mulhall, 2002), was performed using SPSS 16 for Windows to impute missing data on all included scales. The EM algorithm is an iterative optimization method used for finding maximum likelihood estimates of unknown parameters in latent variables.

Measures

The first part of the questionnaire contained a number of mainly seven point Likert-scale single items and short scales from which the following were selected: education, years of marriage,

number of lifetime traumatic events, degree of social support, use of medication and alcohol, sense of forewarning before the death, distress, death anxiety and helplessness in relation to the illness and death situation, feeling of helplessness in relation to the death situation, course of illness of the deceased, religious activities, experience of meaning, peace and purpose with life in spite of the loss (e.g. "Even in relation to the death I feel that there is a purpose with my life"), and emotional loneliness ("I feel lonely even when I am with others"). Data was collected via self-report questionnaires.

Dependent psychological variables

The second part of the questionnaire contained a number of well proven scales from which the following were selected for this study:

Harvard Trauma Questionnaire-Part IV (HTQ; Mollica, Caspi-Yavin, Bollini, & Truong, 1992) was used to estimate the occurrence of PTSD. HTQ consists of 31 items, rated on a four-point Likert scale ranging from *not at all* (1) to *very often* (4). The total score of HTQ in this study was based on the first 16 items which closely correspond to the DSM-IV symptoms of PTSD. These 16 items can be further divided to represent the three core clusters of PTSD in the DSM-IV: intrusion, avoidance, and arousal. The questions relate to symptoms present in the last month in relation to the loss of the spouse (American Psychiatric Association, 1994). In this study participants were considered for PTSD if they fulfilled the three core criteria with scores of *often* (3) or *very often* (4) on at least one intrusion item, three avoidance items and two arousal items as defined in the DSM-IV (*ibid.*). The Danish version of the HTQ has been found to be a reliable and valid measure (Bach, 2003). The internal consistency of the PTSD scale and subscales of baseline and follow ups in this study was satisfying (total HTQ: $\alpha = .84-.88$; intrusion: $\alpha = .68-78$; avoidance: $\alpha = .72-.82$; arousal: $\alpha = .66-77$).

The Crisis Support Scale (CSS: Joseph, Andrews, Williams, & Yule, 1992) measures social support after a traumatic event. The seven items rated on a seven-point Likert scale ranging from *never* (1) to *always* (7) are related to perceived social support (*ibid.*). The scale has been found to have good psychometric properties (Elklit, Pedersen, & Jind, 2001). The internal consistency of the CSS in this study was critically low at baseline ($\alpha = .52$), but adequate at follow ups which ranged between $\alpha = .68-.72$.

The Coping Style Questionnaire (CSQ: Roger, Jarvis, & Najarian, 1993) consisted of 37 items rated on a four-point Likert scale ranging from *never* (1) to *always* (4) measuring four coping styles; rational coping, emotion-focused coping, avoidance coping, and detached coping (*ibid.*). The internal consistency of the subscales in baseline and follow ups of this study were satisfactory (rational coping $\alpha = .76-.82$; emotion-focused coping $\alpha = .77-.86$; avoidant coping $\alpha = .62-.69$; detached coping $\alpha = .61-.72$).

Sense of Coherence (SOC: Antonovsky, 1987). The SOC consists of 29 items rated on a seven-point Likert scale, with good internal consistency. Although subscales are available, it has been suggested that a single factor solution with a possible range of scores from 29 to 203 is the most applicable (Antonovsky, 1993). The single factor solution was used in this study, and had a very satisfying internal consistency ($\alpha = .81-.86$ at baseline and follow ups).

The Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985) consist of five items rated on a seven point Likert Scale ranging from *strongly disagree* (1) to *strongly agree* (7), and has shown an internal consistency of $\alpha = .87$ and a two month test-retest correlation of .82 (range = 5-35; *ibid.*). The scale has been found to have very good reliability (Shevlin, Brunsten, & Miles, 1998). Most people score in the 21-25 range (Carr, 2004). The internal consistency at baseline and follow ups in the present study ranged between $\alpha = .81-.88$.

The NEO Personality Inventory-Revised (NEO PI-R: Costa & McCrea, 2004), Short version is a Danish version of NEO-FFI that consist of 60 items scored on a five point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5) with good internal consistency (ibid.). The scale has also shown good psychometric qualities with older populations (Aluja, Garcia, Rossier, & Garcia; 2005; Cappeliez, O'Rourke, & Chaudhury, 2005). The internal consistency of the five factors ranged between $\alpha = .65-.83$.

Data analysis

Descriptive statistics and reliability measures of scales and subscales were analyzed. Analyses of variance were conducted to investigate possible differences on important variables according to gender, participation at T1 and T4, and participants with and without PTSD at T4. Frequency analysis of PTSD and sub-clinical posttraumatic symptoms were performed, and a Chi-square statistic and effect size calculated to investigate differences in PTSD symptoms between the comparison and bereaved group. Univariate analysis of variance was performed to control for possible covariates. A repeated measures one-way ANOVA was used to determine possible significant change in the HTQ-total score and identified risk factors across the four points of measurement. Linear and hierarchical regression analysis was performed to investigate predictors of long term PTSD.

Results

Analysis of variance revealed significantly less further education ($F(1,199) = 11.57; p < .001$), and significantly more years of marriage ($F(1,292) = 4.36; p < .05$), more use of emotional coping ($F(1,294) = 4.06, p < .05$), and a higher degree of neuroticism ($F(1,294) = 23.13, p < .001$) in widows compared to widowers.

Participants at T4 had significantly more public schooling ($F(1,284) = 3.83; p < .05$) and further education ($F(1,199) = 5.18; p < .05$), had been married for fewer years ($F(1,292) = 6.42; p < .05$).

.01) and participated less often in the daily care of their spouse ($F(1,260) = 7.38; p < .01$) than the drop-out participants who only participated at T1. No significant differences emerged between the two groups in relation to measures of PTSD, sense of coherence, satisfaction with life, and social support, while significantly lower scores were identified on functional problems ($F(1,294) = 4.71; p < .05$), neuroticism ($F(1,294) = 4.10; p < .05$), and emotional coping ($F(1,294) = 4.08; p < .05$) in participants at T4 compared to the drop-outs.

PTSD frequencies

Based on the results reported on the HTQ 16% (46 persons) of the elderly bereaved at T1 fulfilled the three core symptom clusters of PTSD compared to 4% (12 persons) in the comparison group. A Pearson's Chi-square statistic confirmed that PTSD was significantly more frequent among the elderly bereaved ($\chi^2(1, N=572) = 19.63, p < .0005$). Univariate analysis of variance indicated that this finding remained significant when controlling for age and gender ($F(1) = 63.04, p < .0005$). The assumptions of homogeneity and linearity were met for the two selected covariates. There was a medium effect size for the HTQ total scores in the elderly bereaved at baseline compared to the comparison group (ES=.35; Cohen's $d=.74$). As illustrated in Table 1, the frequency of full PTSD remained relatively stable across the four times of measurement.

Table 1

A repeated measures one-way ANOVA revealed no significant differences in the HTQ total scores measuring PTSD symptoms between the four measurement points ($F(1,148) = 1.04, p < .31$).

A summary of significant results of the ANOVA of participants with and without PTSD at T4 are displayed in Table 2.

Table 2

Risk factor stability

A repeated measures one-way ANOVA revealed that there were no significant differences between the four measurement points in terms of total scores on the following variables: Sense of coherence ($F(1,148) = .57, p = .45$), emotional coping ($F(1,148) = 1.3, p = .26$), emotional loneliness ($F(1,108) = .42, p = .52$), and functional problems ($F(1,148) = .47, p < .50$). Small, but significant differences were found in satisfaction with social support ($F(1,148) = 8.92, p < .005$; T1 $M = 6.55$, T4 $M = 6.19$; eta-squared = .15), meaning with life after the loss ($F(1,143) = 7.3, p < .01$; T1 $M = 4.6$, T4 $M = 5.1$; eta-squared = .09), sense of peace in relation to meaning with life after the loss ($F(1,144) = 18.12, p < .000$; T1 $M = 4.01$, T4 $M = 4.82$; eta-squared = .11), and sense of purpose with life after the loss ($F(1,145) = 4.19, p < .05$; T1 $M = 4.85$, T4 $M = 5.12$; eta-squared = .03). No follow up measures of neuroticism existed but analysis of variance revealed small, yet significantly higher levels of neuroticism in the elderly bereaved compared to the comparison group ($F(2,570) = 4.07; p < .05$; Elderly bereaved $M = 17.93$, comparison group $M = 17.08$).

Risk factors as predictors for long term PTSD

To investigate predictors of PTSD 18 months post loss, the following 11 variables from T1 were selected based on the domains of the integrative risk factor framework for the prediction of bereavement outcome proposed by Stroebe et al. (2006) who investigated such on the domain level using linear regression analysis. In the intrapersonal domain, neuroticism was chosen as a factor of personality combined with three items of meaning of life in relation to the loss. In relation to appraisal and coping, emotional coping represented coping, while sense of coherence was chosen as an approximated representation of appraisal. In the interpersonal domain satisfaction with social

support was selected as a measure of social support while emotional loneliness represented isolation. Finally, in the bereavement situational domain, functional problems, helplessness, and early posttraumatic symptoms were selected as representations of reactions directly related to the bereavement situation. The results are displayed in Figure 1

Figure 1

Demographic variables of age, gender, education, length of marriage, number of children etc were the first variables entered into the hierarchical regression analysis, but all were non-significant. The selected 11 variables from T1 were entered in the following steps starting with factors considered relatively stable across time and moving towards more unstable factors as the analysis progressed: 1. Intrapersonal risk factors, 2. Appraisal and coping, 3. Interpersonal risk factors, and 4. Bereavement situation related risk factors. As displayed in Table 3 all 11 variables predicted 49% of the variance in symptoms of traumatic distress (HTQ total) at T4 according to the hierarchical regression analysis. Only a single variable, HTQ-total at Time 1, remained significant. A linear regression analysis showed that this variable alone predicted 35% of the variance in posttraumatic symptoms at T4 ($F(164)=89.71, p<.0005$).

Table 3

Discussion

Several differences emerged when comparing participants at T4 with the drop-outs that only participated at T1. The drop-outs had shorter educations, had been married to their late spouse for more years, and had more often participated in the daily care of their terminally ill spouse than the participants who remained in the study at T4. They also had higher scores on emotional coping, neuroticism, and functional problems. In line with previous bereavement research the results of this study indicate that the drop-outs were generally more anxious, had higher scores on neuroticism, were more burdened in their daily functioning by the loss, and had shorter educations than the participants that remained in the study (Stroebe et al., 2001). Somewhat surprisingly, no differences emerged between the two groups in relation to PTSD, sense of coherence, and satisfaction with life, indicating that the T4 participants in spite of their higher educations and lower neuroticism scores had the same levels of PTSD and life satisfaction as the more anxious drop-outs.

Participants with PTSD at T4 had experienced more traumatic events, more helplessness, social and emotional loneliness, emotional coping, neuroticism, early distress etc., and less sense of coherence, satisfaction with life, and social support at T1, than people without PTSD at T4. Many of these variables are consistent with previously identified risk factors in the bereavement outcome research literature (e.g. Stroebe et al., 2006).

Eighteen months after the death of a spouse, 16% of the elderly bereaved still fulfilled the three core symptom clusters of PTSD. No significant difference in PTSD frequency was found between T1 and T4. Only 4% of the comparison group participants fulfilled the three core symptom clusters of PTSD. In line with the findings in the comparison group of this study, a national probability study found a twelve month prevalence for PTSD of 3.5% (Kessler, Chiu, Demler, & Walters, 2005). The results underline that the loss of a spouse in old age is indeed a traumatic stressor for some. A significant minority of the elderly bereaved suffered from PTSD, and overall the level of posttraumatic distress did not subside with time.

The majority of the selected risk factors remained stable across time, indicating that, sense of coherence, emotional coping, and emotional loneliness may be trait-like variables, belonging to the personal characteristics of the bereaved individual, and likely to be identifiable in the bereaved person even before the death of the spouse. Small, but significant differences were found in satisfaction with social support, meaning with life after the loss, and sense of peace and purpose with life after the loss, indicating that these variables may be more directly related to the bereavement situation than the above, and may be a product of the such rather than primarily stemming from the personality of the bereaved individual.

Previous studies have generally investigated the relationship between one or only a few variables with reference to the prediction of the bereavement outcome. The integrative risk factor model suggested by Stroebe et al. (2006) was derived from this literature and is aimed at providing a step towards a more integrative view on risk factors for bereavement outcome. The results of this study drew on the above model and indicated that each domain at T1 when investigated independently predicted a considerable part of the variance in posttraumatic symptoms at T4; intrapersonal risk factors predicted 22%, coping and appraisal 30%, interpersonal factors 20%, and bereavement situation related factors predicted 40% of the variance of PTSD symptoms at T4. The hierarchical model including all domains predicted 49% of the variance of PTSD symptoms at T4. Only early posttraumatic distress remained a significant predictor in the last step of the analysis, alone predicting 35% of the variance. All the domains investigated, especially that of coping and appraisal and that of the bereavement situation, were predictors of chronic PTSD when investigated alone. However, when incorporated into a theoretically meaningful, integrative framework the overall predictive ability was markedly reduced. The findings indicate that theoretical and empirical overlap may exist between variables within the investigated domains, and alludes to the fact that the identification of a list of relatively few risk factors for chronic PTSD, following late life

bereavement, for the purpose of reliable screening may be difficult. The results underline the vast complexity of the bereavement situation. As a step in the direction of a more integrative way of viewing predictors for bereavement outcome, the integrative risk factor framework by Stroebe et al. (2006) turns the focus to some of the pathways in need of further investigation, while maintaining the awareness of the complexity of these processes. Future research that aims to clarify relationships between the domains and variables within each domain may be the next step with reference to mapping the pathways of bereavement outcome, and therefore such may help streamline preventive interventions with the bereaved. Yet, it is worthwhile to keep in mind that chronic, bereavement related PTSD may be predicted by other factors than those previously identified within bereavement studies which have generally focussed on other measures of psychological distress. Therefore, it is possible that the proposed model is not ideal when investigating risk factors for bereavement related PTSD. Nevertheless, many of the risk factors selected for the analyses have also been found to be important predictors of PTSD (Denson et al., 2007), therefore suggesting that the model is likely to be applicable for bereavement related PTSD.

Early posttraumatic distress alone, as the only variable remaining at a significant level in the last step of the hierarchical regression analysis, predicted a large part of the variance in later posttraumatic distress. Combined with the fact that the PTSD frequency remained almost unchanged across time, this underlines the importance of including PTSD when working scientifically or clinically with the elderly bereaved. Special attention must be paid to early posttraumatic distress as a factor for the prediction of bereavement related PTSD in the elderly bereaved. Uncovering early posttraumatic distress and offering appropriate preventive intervention to distressed elderly bereaved individuals shortly after the event may help prevent later problems with psychological and physical health and quality of life.

The current study is not without its limitations. First, the response rate of 41% might be considered relatively low, as well as the fact that the attrition rate of 28% at the first follow up six months post loss might be considered relatively high. Another limitation is the small, but significant differences in gender and age between the elderly bereaved and the comparison group. A probable reason for the gender difference is that relatively more elderly men are married while relatively more elderly women are widows. The age difference is most likely due to the fact that the older an elderly couple is, the more likely it is that one of them becomes bereaved. Ideally, these issues should have been taken into consideration when sampling for the comparison group, for example through one-to-one matched recruitment with the bereaved participants. However, when comparing the bereaved group and the comparison group the difference in PTSD-scores remained significant when controlling for age and gender, indicating reliable findings in spite of the differences in age and gender between the two groups.

In relation to response rates, both bereaved and elderly samples usually have relatively low response rates in psychological survey studies compared to younger or non-bereaved samples. Additionally, the mortality rate is higher in the first few months after bereavement, especially in the elderly (Ekwall, Sivberg & Hallberg, 2004; Stroebe et al., 2001), seen in this light the response rates can be considered satisfying. Another explanation for the response rate may be found in the recruitment of participants through the Danish CPR register, which is also one of the major strengths of the study. This type of recruitment is likely to include participants more representative of the population than participants recruited through active responses to newspaper ads, hospital records, local practitioners, obituaries, membership of certain associations etc. as most previous studies of spousal bereavement based their recruitment on (Stroebe et al., 2001). Furthermore, it must be noted that the majority of previous studies on PTSD and old age bereavement, or on bereavement in general, did not include comparison groups (Stroebe et al., 2001). The fact that this

study includes a comparison group must be considered one of its major strengths as may the CPR recruitment strategy. Also the longitudinal design allowing investigation of the hypothesis at several time points across the first 18 months post loss must be considered a major strength.

While it is clear that the loss of a spouse in old age is traumatic for some, future research on the prevalence of and risk factors for chronic PTSD in the elderly bereaved, other subgroups, and other types of losses is essential to gain a better understanding of if and how the loss of a loved one by natural causes can be traumatic. Further investigation of the long term relationship between different types of complicated grief reactions such as PTSD, depression, and Complicated Grief Disorder may progress this understanding, as may examining different trajectories of bereavement related PTSD.

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Table 1

Frequencies of PTSD Across the Four Times of Measurement

T1 (N = 296) T2 (N = 221) T3 (N = 187) T4 (N = 184) CG (N =276)

No. of PTSD Criteria

0	10% (<i>n</i> = 28)	17% (<i>n</i> = 38)	21% (<i>n</i> = 40)	23% (<i>n</i> = 42)	51% (<i>n</i> = 141)
1	44% (<i>n</i> = 130)	41% (<i>n</i> = 91)	36% (<i>n</i> = 68)	40% (<i>n</i> = 74)	32% (<i>n</i> = 87)
2 Subclinical PTSD	31% (<i>n</i> = 92)	25% (<i>n</i> = 56)	25% (<i>n</i> = 46)	21% (<i>n</i> = 38)	13% (<i>n</i> = 36)
3 Full PTSD	16% (<i>n</i> = 46)	16% (<i>n</i> = 36)	18% (<i>n</i> = 33)	16% (<i>n</i> = 30)	4% (<i>n</i> = 12)

Note. T1 = Time 1, 2 months post loss. T2 = Time 2, 6 months post loss. T3 = Time 3, 13 months post loss. T4 = Time 4, 18 months post loss. CG = Comparison Group, in average 13 months post loss.

Table 2
Summary of Analysis of Variance of Participants with and without PTSD at T4 (N=184)

Source	<i>F</i>	η	<i>p</i>
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Between groups			
No. of traumatic events, T1	11.95***	14.42	.001
Helplessness, T1	6.38**	70.7	.01
No faith, T1	5.27*	.65	.02
Social loneliness, T1	5.86*	19.66	.02
Emotional loneliness, T1	9.98***	26.66	.002
HTQ-total, T1	21.97***	1130.48	.000
Emotional coping, T1	20.15***	237.33	.000
Detached coping, T1	4.94*	54.90	.03
Sense of Coherence, T1	19.79***	5227.60	.000
Satisfaction with Life, T1	6.86**	198.16	.01
Crisis social support, T1	9.96***	251.30	.002
Neuroticism, T1	10.53***	476.25	.001
Conscientiousness, T1	4.8*	180.77	.03

Note. T1 = Time 1, 2 months post loss. T4 = Time 4, 18 months post loss. Degrees of freedom = 1.

* $p < .05$ ** $p < .01$ *** $p < .005$

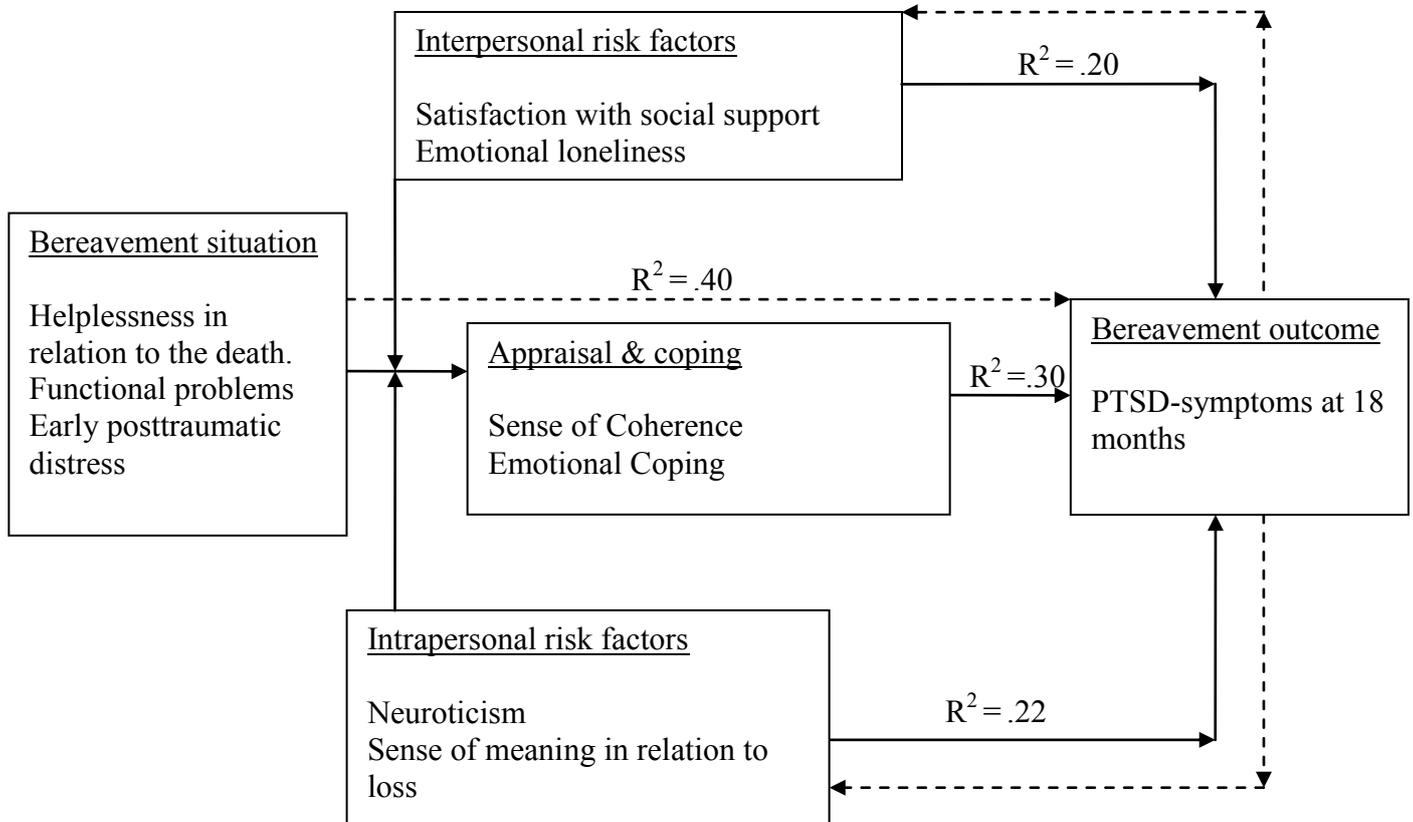


Figure 1. Selected variables in the domains of the integrative risk factor frame work for the prediction of bereavement outcome. Modified from Stroebe et al. (2006).

Table 3

Hierarchical Regression Analysis With Posttraumatic Symptoms (HTQ total at T4) as Dependent Variable.

Variable at T1	Step 1	Step 2	Step 3	Step 4
Neuroticism	.28**	.20	.03	-.06
Meaning with life	.18	.17	.17	.14
Sense of peace	-.25*	-.23*	-.21*	-.09
Sense of purpose	-.31*	.17	-.17	-.24
Emotional Coping		.25*	.22*	.06
Sense of Coherence		-.27*	-.19	-.12
Emotional loneliness			.14	.10
Social support			-.11	-.03
Helplessness				-.01
Daily function				.12
HTQ total				.33**
Model R^2 (%)	31	41	43	49
ΔR^2 (%)		10***	2***	6***
$F(df)$	$F(4,102) = 11.5$	$F(6,100) = 11$	$F(8,98) = 9$	$F(11,95) = 8$

Note. T1 = Time 1, 2 months post loss. T4 = Time 4, 18 months post loss.

* $p < .05$ ** $p < .01$ *** $p < .0005$