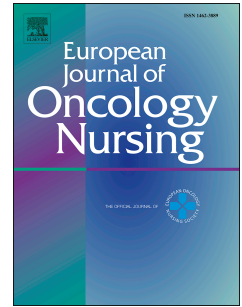


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Protective and risk factors associated with psychological distress in cancer-bereaved parents: a cross-sectional study

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Omid Rasouli: Methodology, Formal analysis, Writing - original draft.

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Trude Reinfjell: Conceptualization, Methodology, Supervision, Writing - Review & Editing.

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ABSTRACT

Purpose: Research shows that knowledge about mental health status, both protective and risk factors, is limited in cancer-bereaved parents. The study aimed to investigate (1) the extent of psychological distress in bereaved parents 2-8 years after the loss of a child to cancer compared to non-bereaved parents, and (2) psychological distress in association with resilience, the extent of having coped with the grief, time since the loss, and past psychological distress in cancer-bereaved parents.

Design: Retrospective, cross-sectional study.

Methods: A Norwegian nationwide study-specific questionnaire was completed by 162 parents who lost a child to cancer, and 77 matched non-bereaved parents. We used the Cohort Norway-Mental Health Index and Resilience Scale for Adults to measure psychological distress and resilience, respectively. The extent of having coped with grief was also measured.

Results: Bereaved parents experienced significantly more symptoms of psychological distress, albeit not clinical psychological distress, compared to non-bereaved parents. The bereaved parents who have coped with their grief or had higher resilience reported lower psychological distress. Positive “Perception of self” and well “Planned future” were the strongest predictors of psychological distress in both bereaved fathers and mothers.

Conclusion: Both fathers and mothers experience more psychological distress symptoms 2-8 years after losing a child to cancer than non-bereaved parents. The findings also highlight the need for long-term support to bereaved parents in order to help to improve their resilience and to better cope with their grief.

Keywords: Bereaved Families; Childhood Cancer; Mental Health Problems; Grief; Resilience; Bereavement

Protective and risk factors associated with psychological distress in cancer-bereaved parents: a cross-sectional study

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INTRODUCTION

Grief after death is something most people experience during their lives and can be defined as an emotional response to the loss of someone close (Stroebe et al., 2006). It is difficult to define a healthy grief process (Jaaniste et al., 2017), but most people can cope with this painful loss and adapt to a new life after some time. Conversely, others may develop extensive psychological distress associated with the loss (Kristensen et al., 2017) and may face more significant consequences (Sirki et al., 2000). The dual-process model is a dynamic model to explain how grief is coped with, emphasizing continuous shifts between loss-oriented and restoration-oriented processes (Stroebe and Schut, 2010).

Cancer is the second most common cause of death among children (McCarthy et al., 2010). The grieving process of losing a child is something different and more severe than the loss of others (Kreicbergs et al., 2004a). There have been some studies investigating psychological distress in cancer-bereaved parents (Kreicbergs et al., 2004a; Lindahl Norberg et al., 2011; Morrow et al., 1981; Rosenberg et al., 2012; Wikman et al., 2018), but they mostly assessed psychosocial distress between subgroups of non-bereaved parents (Goodenough et al., 2004; Jalmsell et al., 2010; Lannen et al., 2008; Valdimarsdóttir et al., 2007). Moreover, previous research had some limitations such as small sample size, short interval time after the loss, lack of a non-bereaved control group, or had inconsistent results. For example, bereaved mothers were reported more prone to psychological distress than bereaved fathers (Kreicbergs et al., 2004a; Sirki et al., 2000), whereas, no gender differences were found in anxiety or depression scores between the bereaved parents.

The role of protective factors is more important than reducing risk factors during stressful life events (Friborg et al., 2003). Nevertheless, the focus of grief research has mainly been on risk factors associated with increased psychological distress, and protective factors have received little attention (Jaaniste et al., 2017; Maccallum et al., 2015; Rosenberg et al., 2012). The role

of protective factors and their associations with some important risk factors (e.g., coped with grief, time since loss, and past psychological distress) remain unclear because of limited research in this bereaved group (Vegsund et al., 2019). *Resilience* refers to “a dynamic process encompassing positive adaptation within the context of significant adversity” (Luthar et al., 2000). This notion has two critical conditions: exposure to significant threat or severe adversity, as well as the achievement of positive adaptation despite major assaults on the developmental process (Luthar and Zigler, 1991). The growing interest in resilience and its potential impact on health and well-being is mostly to identify protective factors and mechanisms promoting healthy adjustment despite being exposed to significant life stressors like losing a child (Windle, 2011). Previous research showed that high resilience predicted a healthy adjustment to grief among cancer-bereaved parents (Vegsund et al., 2019), and it was associated with good mental health among mothers of survived children with cancer (Eilertsen et al., 2016). However, due to little research, it is unclear which factors of resilience are mostly associated with good mental health in cancer-bereaved parents compared to non-bereaved parents. To help this vulnerable group, it is essential to identify both protective and risk factors associated with psychological distress.

Therefore, this nationwide study aimed to investigate (1) the extent of psychological distress in bereaved parents 2-8 years after the loss of a child to cancer compared to non-bereaved parents, and (2) psychological distress in association with resilience, the extent of having coped with the grief, time since the loss, and past psychological distress in cancer-bereaved parents. Moreover, we hypothesized that cancer-bereaved parents would show more symptoms of psychological distress compared to non-bereaved parents. Further, those parents who reported higher resilience and coped more positively with their grief would report lower psychological distress.

METHOD

Design

This study had a retrospective, cross-sectional design. Information was obtained through a self-report questionnaire from the parents. The study was approved by the Regional Committees for Medical and Health Research Ethics (REK: 2014/1997).

Participants and Procedure

In total, 246 children (73 boys and 89 girls) who died to cancer at ages 1-24 years in the period January 2009 to December 2014, were identified through the Cancer Registry and confirmed by the Cause of Death Registry. Accordingly, 473 bereaved parents of the deceased children were identified by the National Population Registry. The inclusion criteria were living in Norway, speaking Norwegian, and having an identifiable phone number. An invitation letter with a consent form was sent to all parents who met the inclusion criteria. A reminder was distributed to 264 parents who had not responded to the first request. Ten parents were excluded since their child died due to other causes. The questionnaire with a free return envelope was mailed to 230 bereaved parents (49.6%) who agreed to participate. Later, 11 parents (4%) withdrew their consent. Also, 58 bereaved parents (25.2%) did not return the questionnaire despite giving the consent to participation. Finally, 162 parents (64 fathers and 98 mothers) returned the completed questionnaire (34.8%); 110 persons were parents of the same child.

Parents in the control group were selected based on matching the characteristics of their children with the deceased children, including age, gender, and region of residence.

Accordingly, 492 parents were identified through the National Population Registry as potential participants and were invited to participate in the study. Invitation letter, consent, and questionnaires were provided for the non-bereaved parents in the same way as the

bereaved parent group. The written consent was received from 84 parents (17.7%), but 77 individuals (30 fathers and 47 mothers) returned the completed questionnaires (15.7%).

Thirty-eight participants were parents of the same child.

Assessment scales

We used two separate questionnaires for the bereaved and non-bereaved groups; however, most questions were similar for both groups. Each questionnaire consisted of standardized scales and study-specific questions from a translated version of a Swedish study-specific questionnaire for cancer-bereaved parents (Kreicbergs et al., 2004b; Vegsund et al., 2018).

Demographic information

Demographic characteristics were obtained from both groups, including marital status, age, sex, number of children, education, employment status, and region of residence. The bereaved group received questions about the deceased child's age, time since loss, loss of a close person in recent years, past psychological distress, and grief.

Grief

Grief was measured by a question: "To what extent do you think you have coped with your grief over your child's death?" with three response options: "No, not at all," "Yes, a little," and "Yes, fairly much." Some studies have used this simple question to measure grief in cancer-bereaved parents (Bylund-Grenklo et al., 2016; Kreicbergs et al., 2007; Lannen et al., 2008; Sveen et al., 2014). It was tested in face-to-face interviews to assure that the item was understood by the parents as intended by the researchers, having coped with their grief or resolved their grief (Lannen et al., 2008). Also, it was validated against three questions adopted from the Inventory of Complicated Grief; i.e., strong longing for the lost person,

perceives life as empty without the lost person, and unable to trust others; all three correlated strongly with our single-item question about grief resolution (Sveen et al., 2014).

Psychological distress

Psychological distress in both groups was measured using CONOR Mental Health Index (CONOR-MHI) (Søgaard et al., 2003). CONOR-MHI consists of seven questions with four-answer options developed based on the Hopkin Symptom Check List (HSCL), General Health Questionnaire, and other health surveys (Søgaard et al., 2003). Participants reported what they felt during the last two weeks (see (Søgaard et al., 2003)). The total score ranges 7-28, but the average score is calculated by dividing the total score on seven. CONOR-MHI was found to correlate strongly with HSCL-10 and Hospital Anxiety and Depression Scale (HADS) (Bjelland et al., 2002) and measures of psychological distress, anxiety, and depression (Søgaard et al., 2003). $\text{CONOR-MHI} \geq 2.15$ was a cut-off value for clinical psychological distress (Søgaard et al., 2003).

Resilience

A revised version of the Resilience Scale for Adults (RSA) was used to measure resilience in the bereaved group (Friborg et al., 2003; Friborg et al., 2006). The RSA is a 33-item self-report scale; each item is rated on a seven-point scale, and the total score ranges between 33-231, where higher scores indicate higher levels of resilience. The RSA consists of six subscale/factors which covers both *intrapersonal* protective resources: “Perception of self” (6 items), “Planned future” (4 items), “Social competence” (6 items), and “Structured style” (4 items), and *interpersonal* protective resources: “Family cohesion” (6 items) and “Social resources” (7 items). RSA is considered a reliable and valid questionnaire for assessing resilience (Friborg et al., 2009; Friborg et al., 2003).

Statistical analysis

The statistical analyses were performed by SPSS software, version 25. Internal consistency was measured by Cronbach's alpha (α) as a measure of scale reliability in our sample. Demographic variables were compared between the groups using independent t-tests for continuous variables and Chi-square tests or Fisher's exact tests for categorical variables. Fisher's exact test was performed when the expected values were too low (Field, 2013). Due to the non-normal distribution of CONOR-MHI, the Mann-Whitney U test was used to compare psychological distress between the groups. Spearman correlation analysis was run separately for each gender in the bereaved group; then, significant variables were added to a two-step hierarchical multiple linear regression for the bereaved mothers and fathers separately. In the first step, "coped with grief" was added to the model. In the second step, the RSA total score was entered into the model while controlling for "working through grief". Due to multicollinearity between the RSA factors, six new two-steps hierarchical multiple linear regression was run for each gender. The first step "coped with grief" was added to the model, but in the second step, RSA total score was replaced with one of the RSA factors. Two independent variables were chosen in each of the regression analyses to generate a reliable regression model (Green, 1991). The alpha level of significance was set at $p < 0.05$.

RESULTS

Overall, there were satisfactory internal consistencies for all resilience factors ($\alpha > 0.80$) and psychological distress ($\alpha = 0.86$), except for "Structured style" ($\alpha = 0.54$). Table 1 shows the demographic variables. There were no significant differences between the demographic variables except that; more bereaved fathers lived in a small town ($p = 0.01$) than the non-

bereaved fathers, and the bereaved mothers were older compared to the non-bereaved mothers ($p= 0.01$).

<Table 1 about here>

Comparison of psychological distress

Analyses revealed significantly higher psychological distress in the bereaved mothers (median= 1.57) than the non-bereaved mothers (median= 1.29), [U= 1261, $z= -4.36$, $p< 0.001$, $r= 0.36$] with a medium effect size, and the bereaved fathers (median=1.54) compared to the non-bereaved fathers (median= 1.14), [U= 501, $z= -3.68$, $p< 0.001$, $r= -0.38$] with a medium effect size. However, no significant differences were found in the clinical psychological distress between the mothers ($p= 0.18$) or fathers ($p= 0.11$).

Psychological distress in the bereaved group

There were significant correlations between psychological distress and coped with grief, RSA total score, and RSA factors ($r_s \geq 0.31$, $p \leq 0.01$) in bereaved fathers (Table 2) and mothers (Table 3). However, no significant correlations existed between psychological distress and loss of a close person, time since loss or past psychological distress ($r_s < 0.16$, $p > 0.05$).

<Table 2 about here>

<Table 3 about here>

The overall model of coping with grief and RSA total score was significant in the bereaved fathers [$R^2= 56\%$, $p< 0.001$] and mothers [$R^2= 45\%$, $p< 0.001$] (Table 4). The total score of RSA predicted 37% of the variance when controlled for working through grief in both bereaved parents. All RSA factors significantly predicted variance in psychological distress in both bereaved fathers and mothers; however, “Perception of self” and “Planned future” were the strongest predictors of psychological distress in the bereaved parents.

<Table 4 about here>

DISCUSSION

To our knowledge, this is the first nationwide study investigating the extent of psychological distress in bereaved parents 2-8 years after the loss of a child to cancer compared to non-bereaved parents. Moreover, associations between psychological distress with resilience, the extent of having coped with the grief, time since the loss, and past psychological distress were explored in cancer-bereaved parents.

Psychological distress in the bereaved and non-bereaved parents

Although literature states that cancer-bereaved parents are more likely to experience increased psychological distress than non-bereaved parents (Kreicbergs et al., 2004a), the extent of parents' psychological distress several years after the loss is somewhat unclear. Both bereaved mothers and fathers showed more symptoms of psychological distress 2-8 years after the loss compared to non-bereaved parents; however, neither bereaved mothers nor fathers reported more clinical psychological distress than the parents in the non-bereaved group. Thus, it may take a long time before the parents' psychological distress normalizes. However, bereaved parents did not undergo more frequent clinical psychological distress than the non-bereaved group. It is essential to underline that psychological distress can also be troublesome and distressing for these bereaved parents despite not having more clinical psychological symptoms (Ayuso-Mateos et al., 2010). Contrary to this study, an increased risk of subclinical and clinical psychological distress was reported in cancer-bereaved parents 4-6 years after the loss (Kreicbergs et al., 2004a). It may correspond to using another scale and measuring psychological distress collectively with different follow-up times.

Our findings also support the dual-process model, which views grief as a complex dynamic process, where one continually alternates between processing the grief and living a new everyday life without the deceased (Sandvik, 2003; Stroebe and Schut, 1999, 2010).

Psychological distress such as loneliness and moodiness may be a natural part of grief even 2-8 years after the loss; the bereaved parents sometimes feel an intense loss of the child and that the grief is not finished. It is difficult to define to what extent psychological distress derives either from the time of the child's sickness or due to their grief after the loss. For example, Rosenberg et al. (2014) observed higher psychological distress and reduced resilience in parents of children with cancer during the sickness period.

Regarding gender differences, Kreichbergs et al. (2004) reported a greater risk of psychological distress among bereaved mothers compared to non-bereaved mothers. Conversely, (Wikman et al., 2018) and this study found that both bereaved mothers and fathers had a greater risk of psychological distress. This controversy might relate to assessment time and used scales in the studies.

Protective and risk factors

The present study investigated the protective and risk factors' role to provide a better picture of this vulnerable group. In general, this study shows that bereaved parents who had coped with their grief (risk factor) or had high resilience (protective factor) reported lower psychological distress. Several factors have been suggested that may influence mental health status of bereaved parents after the loss of a child, such as conditions around death, sickness period, and inter- and intrapersonal relationships (Jaaniste et al., 2017; Stroebe et al., 2006). Therefore, assessing mental health in bereaved parents is complex because risk factors in some people may be compensated by some protective factors, but others may not have these compensating factors. Moreover, diverse findings regarding risk factors and gender

differences may indicate that psychological distress after loss is relatively individual- and situation-dependent (Kreicbergs et al., 2004a; Rosenberg et al., 2012; Wikman et al., 2018).

Coping with grief

The finding indicates that bereaved parents who coped with the grief were less prone to psychological distress 2-8 years after the loss. This is in line with previous research that reported that bereaved parents who coped with their grief might face minor psychological distress after losing a child to cancer (Lannen et al., 2008; McCarthy et al., 2010). As mentioned, the loss of a child is an incomprehensible and devastating experience for parents, which may not be comparable with other types of loss of a loved one (Arnold and Gemma, 2008; Davies, 2004). For example, a more intense grieving process has generally been observed in bereaved parents compared to non-bereaved parents (Middleton et al., 1998; Rando, 1985). This intense grief can be explained by the dual-process model, which suggests that grief is coped with by finding a balance between dealing with grief in parallel with moving forward in life (Stroebe and Schut, 2010). Bereaved parents who find the balance between confronting the grief and engaging in life without the deceased child possibly experience better mental health. Previous findings also reported some comorbidity between prolonged grief disorder and psychological distress after the loss (Kristensen et al., 2017).

Time since loss

A weak correlation was observed between years since the loss and psychological distress, indicating that the time factor (here 2-8 years) does not significantly explain parents' psychological distress. Limited, controversial studies exist regarding the importance of time since the loss. Although some studies suggested that psychological distress decreases over time in cancer-bereaved parents (Kreicbergs et al., 2004a; McCarthy et al., 2010; Rosenberg

et al., 2012), others found less decline over time (Martison et al., 1991). After a few years, there are probably other factors that are more strongly associated with psychological distress, such as resilience and grief. More longitudinal studies are needed to explore the development of psychological distress over time.

Past psychological distress

The findings revealed that past psychological distress is not significantly associated with current psychological distress in the cancer-bereaved parents. However, in several models, past psychological distress is considered a risk factor for psychological distress during grief (Jaaniste et al., 2017; Stroebe et al., 2006). One explanation might be that bereaved parents with past psychological distress had received additional follow-up support after the loss, and thus showed less psychological distress afterward.

Resilience

The current study, consistent with the definition of resilience, indicates high resilience scores significantly predicted lower psychological distress in the cancer-bereaved parents, even though losing a child is described as one of the most burdensome life events that a parent may experience (Björk et al., 2016; Middleton et al., 1998). It suggests that resilience is probably a central protective factor for mental health after a child's loss, as well as for coping with the grief (Eilertsen et al., 2016; Vegsund et al., 2019). Resilience is described as a dynamic factor, where a person may be resilient at some point but not on another (Masten and Wright, 2010). Thus, resilience and psychological distress are possibly mutual dynamic factors influencing each other.

All the resilience factors significantly correlated with psychological distress, but "Perception of self" and "Planned future" were the strongest predictors for lower levels of psychological

distress in both bereaved fathers and mothers. The findings highlight the importance of intrapersonal protective resources to protect the bereaved parents from extremely stressful experiences from a long-term perspective. “Perception of self” is about self-confidence and the ability to solve problems, which can probably contribute to greater confidence in recovering from stressors and challenges. A high score on the “Planned future” means that the person has a positive outlook on own future, a sense of belief about the opportunity to succeed, and the ability to plan ahead and formulate clear goals (Hjemdal et al., 2006). Based on the dual-process model (Stroebe and Schut, 2010), with a well “Planned future,” establishing a new everyday life becomes easier given that the person reports greater belief in the realization of their goals and how to achieve them. Parents with well “Planned future” and positive “Perception of self” may have better conditions for balancing the dynamic process of grieving and establishing a new life.

These two resilience factors, “Planned future” and “Perception of self”, are generally higher in men than in women (Friborg et al., 2003). It may suggest that bereaved mothers initially experience fewer opportunities to influence their own situation and future after the loss compared to bereaved fathers do. Instead, women receive more social support than men (Friborg et al., 2003), which may compensate for their lower resilience in stressful life events. Perhaps resilience is an overlooked factor in cancer-bereaved parents, which needs more attention in clinical and research settings.

Study limitations

The major limitation of this study was the low response rates among both groups of parents, with the possible absence of bereaved parents with extensive psychological distress.

Moreover, we only used self-report questionnaires to measure the outcomes. Also, the groups were different regarding age between the mothers and the region of residence between the

fathers. This study had a cross-sectional design that precludes making conclusions regarding causality. Therefore, future research is needed to investigate the interaction between protective and risk factors with psychological distress over time.

Clinical implications

It is beneficial to focus also on protective factors and resources to promote mental health in bereaved parents. The findings underline the importance of long-term follow-up, both as prevention and support in these vulnerable parents.

Conclusion

Both cancer-bereaved fathers and mothers experience more psychological distress symptoms 2-8 years after the loss of a child to cancer compared to non-bereaved parents. Although the bereaved parents did not show clinical psychological distress diagnosis, perceived psychological symptoms may affect their daily functioning and mental health. Bereaved parents who had high resilience (particularly “Perception of self” and “Planned future”) and coped with their grief experienced lower psychological distress. The findings also highlight the need for long-term follow-up and support in these bereaved parents.

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Ethics

The Regional Committee for Medical and Health Research Ethics (Ref. 2014/1997/REK Midt) approved the study.

Data Availability Statement

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

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Table 1. Descriptive characteristics of the bereaved (n= 162) and non-bereaved parents (n=77).

Variables	Bereaved group <i>n</i> (%)		Control group <i>n</i> (%)		
	Fathers <i>n</i> = 64 (39.5%)	Mothers <i>n</i> = 98 (60.5%)	Fathers <i>n</i> = 30 (39.0 %)	Mothers <i>n</i> = 47 (61.0 %)	
Age	53.14 (6.84)	50.43 (7.88)	51.67 (8.38)	46.89 (7.17)	
Number of children [†]	2.70 (0.87)	2.54 (0.95)	2.60 (0.77)	2.60 (0.68)	
CONOR-MHI	1.55 (0.42)	1.69 (0.47)	1.27 (0.28)	1.32 (0.32)	
Time since loss	6.09 (1.58)	6.96 (1.65)	-	-	
RSA total score	172.07 (28.75)	168.95 (27.37)	-	-	
Perception of self	31.74 (6.46)	29.61 (7.36)	-	-	
Planned future	20.70 (5.08)	19.11 (5.54)	-	-	
Social competence	28.04 (7.07)	28.56 (6.94)	-	-	
Family cohesion	32.37 (7.15)	32.31 (7.06)	-	-	
Social resources	38.73 (7.34)	40.08 (7.29)	-	-	
Structured style	20.62 (3.77)	19.23 (4.08)	-	-	
Marital status	Married/living with the deceased child's other parent	55 (85.9)	78 (79.6)	24 (80.0)	38 (80.9)
	Married/living with another person	5 (7.8)	6 (6.1)	3 (10.0)	4 (8.5)
	Living alone but have a partner	1 (1.6)	3 (3.1)	1 (3.3)	2 (4.3)
	Single	3 (4.7)	11 (11.2)	2 (6.7)	3 (6.4)
Employment status	Working	63 (98.4)	82 (85.4)	29 (96.7)	43 (91.5)
	Studying	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)
	Parental leave	0 (0.0)	4 (4.2)	0 (0.0)	1 (2.1)
	Unemployed	0 (0.0)	1 (1.0)	0 (0.0)	0 (0.0)

	Sick leave / disability benefit	0 (0.0)	4 (4.2)	0 (0.0)	3 (6.4)
	Housewife	0 (0.0)	5 (5.2)	1 (3.3)	0 (0.0)
Region of residence	Countryside	12 (19.0)	21 (21.4)	17 (18.3)	11 (23.4)
	Small town	13 (20.6)	25 (25.5)	19 (20.4)	16 (34.0)
	Town	26 (41.3)	32 (32.7)	31 (33.3)	10 (21.3)
	Big city	12 (19.0)	20 (20.4)	26 (28.0)	10 (21.3)
Past psychological distress †	Yes	4 (6.3)	12 (12.2)	0 (0.0)	11 (23.4)
	No	59 (93.7)	86 (87.8)	30 (100)	36 (76.6)
Loss of a close person in recent years	Yes	23 (35.9)	25 (25.5)	13 (43.3)	14 (29.8)
	No	41 (64.1)	73 (74.5)	17 (56.7)	33 (70.2)
Clinical CONOR-MHI §	Yes	5 (7.9)	15 (15.5)	0 (0.0)	3 (6.4)
	No	58 (92.1)	82 (84.5)	30 (100)	44 (93.6)
Coped with grief	Yes	26 (41.9)	32 (33.0)	-	-
	No	36 (58.1)	65 (67.0)	-	-

CONOR-MHI= Cohort Norway-Mental Health Index; RSA= Resilience scale for adults. † child who died of cancer was included in the number for the bereaved group. ‡ before the child became ill for the bereaved group, and throughout life for the non-bereaved group. § CONOR-MHI ≥ 2.15 indicates clinical psychological distress. Data are presented as means \pm standard deviation or *n* (%).

Table 2. Correlation coefficients (Spearman's rho - r_s) between reported psychological distress and other grief-related variables in bereaved fathers.

Variable	Bereaved fathers											
	1	2	3	4	5	6	7	8	9	10	11	
1. CONOR-MHI												
2. Loss of a close person in recent years	0.02											
3. Time since loss	-0.07	-0.15										
4. Past psychological distress	0.13	0.21	0.16									
5. Coped with grief	-0.46***	0.15	0.22	0.04								
6. RSA Total score	-0.64***	0.08	-0.13	-0.18	0.39**							
7. Perception of self	-0.69***	0.04	-0.01	-0.05	0.40**	0.79***						
8. Planned future	-0.59***	-0.10	-0.12	-0.22	0.34**	0.71***	0.73***					
9. Social competence	-0.33**	0.13	-0.12	-0.24	0.24	0.75***	0.51***	0.32**				
10. Structured style	-0.37**	0.14	0.01	-0.05	0.30*	0.53***	0.53***	0.55***	0.21			
11. Family cohesion	-0.52***	0.03	0.03	-0.06	0.13	0.76***	0.44***	0.33**	0.51***	0.21		
12. Social resources	-0.56***	0.08	-0.14	-0.08	0.37**	0.87***	0.52***	0.49***	0.63***	0.31*	0.80***	

CONOR-MHI= Cohort Norway-Mental Health Index; RSA= Resilience scale for adults.

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Table 3. Correlation coefficients (Spearman's rho - r_s) between reported psychological distress and other grief-related variables in bereaved mothers.

Variables	Bereaved mothers											
	1	2	3	4	5	6	7	8	9	10	11	
1. CONOR-MHI												
2. Loss of a close person in recent years	-0.14											
3. Time since loss	-0.16	-0.15										
4. Past psychological distress	0.06	-0.01	-0.16									
5. Coped with grief	-0.30**	-0.01	0.26**	0.003								
6. RSA Total score	-0.62***	-0.003	0.10	-0.08	0.30**							
7. Perception of self	-0.62***	0.02	0.03	0.03	0.34***	0.75***						
8. Planned future	-0.67***	0.07	0.14	0.05	0.37***	0.67***	0.61***					
9. Social competence	-0.31**	-0.02	0.10	-0.18	0.23*	0.65***	0.42***	0.25*				
10. Structured style	-0.37***	0.02	0.10	-0.09	0.03	0.57***	0.37***	0.46***	0.25*			
11. Family cohesion	-0.32***	0.04	0.01	-0.17	0.07	0.63***	0.22*	0.25*	0.26**	0.27**		
12. Social resources	-0.38***	0.01	0.03	-0.08	0.19	0.81***	0.46***	0.37***	0.50***	0.34***	0.71***	

CONOR-MHI= Cohort Norway- Mental Health Index; RSA= Resilience scale for adults.
 * $p \leq 0.05$. ** $p \leq 0.01$. *** $p \leq 0.001$.

Table 4. Summary of multiple linear hierarchical regression analysis of psychological distress as an outcome variable in the bereaved parents 2 to 8 years after the loss of a child.

Step	Independent variables	Bereaved Fathers				Bereaved Mothers			
		ΔF	ΔR^2	β	t	ΔF	ΔR^2	β	t
1	Coped with grief	13.42	0.19	-0.43	-3.66**	7.36	0.08	-0.27	-2.71**
2	RSA total score	47.68	0.37	-0.66	-6.91***	64.50	0.37	-0.64	-8.03***
2	Perception of self	49.59	0.38	-0.68	-7.04***	42.41	0.30	-0.57	-6.51***
2	Planned future	34.80	0.31	-0.59	-5.90***	63.30	0.38	-0.65	-7.96***
2	Social competence	7.34	0.09	-0.32	-2.71**	9.96	0.09	-0.31	-3.16**
2	Family cohesion	19.21	0.21	-0.46	-4.38***	17.01	0.15	-0.38	-4.12***
2	Social resources	19.30	0.21	-0.49	-4.39***	19.55	0.17	-0.41	-4.42***
2	Structured style	17.88	0.19	-0.46	-4.23***	15.05	0.13	-0.36	-3.88***

RSA= Resilience scale for adults. ** $p \leq 0.01$. *** $p \leq 0.001$.

- Cancer-bereaved parents experience more symptoms of psychological distress
- Lower psychological distress in cancer-bereaved parents with higher resilience
- Lower psychological distress in cancer-bereaved parents when coped better with the grief

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Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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