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Parental death during childhood and depression in young adults – a national cohort study

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Background: There are few prospective, population-based studies on childhood parental death and psychiatric disorders in adulthood, and previous findings are inconclusive. This study investigated the association between parental death from natural and external (suicides, accidents or homicides) causes before 18 years and the risk of clinical depression in young adults, in relation to age at loss and gender of both child and parent. **Methods:** In this register-based study, a national cohort born in Sweden during 1973–1982 (n = 862,554) was followed with regard to hospital admissions and outpatient care for depression during 2006–2013. Multivariate Cox proportional hazards models were used to estimate the impact of parental death, taking sociodemographic and parental psychosocial covariates into account. **Results:** Maternal death from natural causes was associated with a hazard ratio (HR) of outpatient care for depression of 1.19 [95% confidence interval (CI), 1.02–1.40] in men and 1.15 (1.01–1.31) in women, after adjustment for sociodemographic confounders, with similar effect sizes for paternal natural death. Death from external causes consistently had higher effect size compared with natural deaths, in particular in relation to risk of hospital admissions for depression where they were as high as HR 3.23 (2.38–4.38) for men, and 1.79 (1.30–2.47) for women after a loss of a mother. Losing a parent in preschool age, compared with losing a parent as a teenager, was associated with higher risks of both hospitalization (p = .006) and outpatient care (p = .001) for depression. **Conclusions:** This study indicates that parental loss to death from natural causes during childhood is associated with a small increased risk of long-term consequences for psychological health. Children who lose their parents to death from external causes, that is suicides, accidents or homicides, and children losing a parent in young ages are, however, at particular risk and should be given priority in preventive interventions after parental loss.
Keywords: Childhood parental death; adult depression; longitudinal; national cohort; familial risk factors; parental psychopathology; social position.

Introduction

In Sweden and in the United Kingdom, 4–5% of all children experience the death of a parent before their 18th birthday (Hjern & Manhica, 2013; Parsons, 2011). Childhood parental death has been associated with adverse health outcomes throughout the life course (Li et al., 2014; Rostila & Saarela, 2011). Previous research has shown an increased risk of psychiatric problems in children and adolescents during the first years following a parent's death (Cerel, Fristad, Verducci, Weller, & Weller, 2006; Dowdney, 2000), including an increased risk of suicidal behaviour (Agerbo, Nordentoft, & Mortensen, 2002; Niederkrotenthaler, Floderus, Alexanderson, Rasmussen, & Mittendorfer-Rutz, 2012) and depressive episodes (Brent, Melhem, Donohoe, & Walker, 2009; Gray, Weller, Fristad, & Weller, 2011).

There are, however, few prospective, population-based studies on the impact of parental death during childhood on subsequent psychiatric disorders in adulthood, and evidence is conflicting (Appel et al., 2013; Dowdney, 2000; Stikkelbroek, Prinzie, De Graaf, Ten Have, & Cuijpers, 2012; Wilcox et al., 2010). In two previous studies from Sweden (Wilcox et al., 2010) and Denmark (Appel et al., 2013), parental death during childhood was associated with an increased risk of hospital admission for depression. In contrast, in a previous Dutch population-based study, no association between parental death and increased risk of mental disorders in adulthood, including depressive disorder, was found (Stikkelbroek et al., 2012). In the latter study, cause of death, gender of the deceased parent and age at loss were not accounted for. Few studies have investigated the importance of age at loss in relation to adult depression (Appel et al., 2013; Wilcox et al., 2010), and previous evidence on the importance of gender of the diseased parent and whether or not outcomes of parental death differ between daughters and sons is inconclusive (Brent et al., 2009; Geulayov, Gunnell, Holmen, & Metcalfe, 2012; Jacobs & Bovasso, 2009). Moreover, as hospitalization primarily reflects severe cases of depression, examining depression using only hospital admission data will exclude milder cases of depression. In this study, we will separately examine both hospitalization data and outpatient care for depression.

Parents who die from violent causes of death (e.g. suicide or accidents) have higher rates of psychiatric disorders and substance abuse (Melhem, Walker, Moritz, & Brent, 2008; Nyhlen, Fridell, Backstrom, Hesse, & Krantz, 2011; Wahlbeck, Westman, Nordentoft, Gissler, & Laursen, 2011). Parental

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psychosocial problems of this kind may have long-term negative consequences on the health of their offspring through their effect on parenting and the psychosocial home environment. The association with familial risk factors makes it difficult to separate consequences of the death itself from familial/environmental and heritable circumstances. Parental loss during childhood is also associated with a more disadvantaged socioeconomic background (Berg, Rostila, Saarela, & Hjern, 2014; Fauth, Thompson, & Penny, 2009), and there may also be socioeconomic consequences for the bereaved family, following the transition to a single-parent household.

The aim of this study was to analyse risk of depression in young adults with experience of childhood parental death, using national register data on hospital admissions and outpatient care for depression. We were particularly interested in comparing the impact of parental cause of death that is external versus natural causes of death, and to investigate the importance of gender and the child's age at the time of death of the parent.

Methods

This study is based on information from Swedish national registers, containing data with high validity and low attrition rates (Ludvigsson et al., 2011, 2016). These registers are based on the unique personal identity number assigned to all Swedish residents at birth (or time of immigration), and data from different registers can be linked by use of these identity numbers. In data sets available to researchers, these numbers are replaced by random reference numbers and all data are analysed anonymously. Thus, the rule about informed consent is not applicable. Data are handled in agreement with the Swedish legislation on research in national registers and have been approved by the ethics committee in the Stockholm region (No. 2014/415-31/5).

Our study population included all individuals born in Sweden between 1973 and 1982, with two birth parents in the Multi-Generation Register, who had not been adopted and who were alive and resident in the country in 2005 (n = 862,554).

Parental death during childhood

The Cause of Death Register was used to retrieve information on parent's time and cause of death. Childhood parental death was defined as death of a parent before 18 years. Causes of death were classified according to the International Classification of Diseases (ICD) as deaths caused by natural causes (i.e. deaths caused by diseases, ICD-8 code: 0000-7969; ICD-9 code: 000-796; and ICD-10 code: A00-R99) or external causes (i.e. deaths caused by accidents, homicide or suicides, ICD-8 code: 8000-9999; ICD-9 code: 800-999; and ICD-10 code: V01-Y98). Parental death from suicide was investigated separately in additional analyses (ICD 8-9: E950–E959, E980–E989; ICD-10: X60–X84, Y10–Y34).

Depression in young adulthood

We used hospital data to include severe cases of depression that require inpatient care as well as information on outpatient care for depression, obtained by linkage to the National Hospital Discharge Register. Information on outpatient care is available from 2002 but without complete coverage during the first years, whereupon we excluded the first years and defined in- and outpatient care for depression as at least one entry in the register during 2006–2013.

Sociodemographic covariates and parental psychosocial pathology

Information on gender, year of birth, geographic residency (categorized as city, town and rural) and parental country of birth (categorized as Sweden, Mixed, European and Non-European) was retrieved from the Total Population Register. Parent's highest educational level (categorized as compulsory school, secondary school, university <3 years and university ≥3 years) was retrieved from the Educational Register.

Parental mental health problems/admission to psychiatric care (categorized as yes or no) was defined by using hospitalizations with a diagnosis indicating psychiatric disorders and/or self-inflicted injuries according to the Patient Discharge Register. Parental substance abuse (yes/no) was defined by using hospital admissions with an ICD diagnosis indicating alcohol or illicit drug use. Parental criminality was defined as having been convicted of a crime that resulted in a sentence of probation, prison or psychiatric care, according to the Register of Court Convictions. These parental indicators were constructed separately for mothers and fathers and were defined by at least one recorded case when the child was aged 0–18 years. Information on child welfare interventions was retrieved from the Register of Children and Young Persons Subjected to Child Welfare Measures.

Statistical analyses

Cox proportional hazards models were used to estimate hazard ratios (HRs) and corresponding 95% confidence interval (CI) for hospital admissions and outpatient care for depression, in relation to childhood parental death. Person time of follow-up was accumulated from January 2006 until the date of the first admission, date of death from the National Cause of Death Register or end of follow-up in December 2013.

In the multivariate models, data were analysed that were adjusted for birth year (model 1), and birth year, geographic residency, parental country of birth and parental highest education (model 2); covariates should be relatively unaffected by a parent's death and therefore considered as possible confounders. In additional analyses, we further adjusted for social welfare benefits in the surviving parent (as an indicator of the postdeath economic status of the family), and substance abuse, psychiatric disorder and major crime in the surviving parent; variables may be regarded as potential mediators of the associations and could both precede and/or follow parental death. In these additional analyses, maternal death was analysed with paternal covariates and vice versa. Child welfare interventions, which may have occurred before or after the parent's death, were not included in the regression models; adjusting for such a covariate may in part control for confounding as well as for the consequences of the death.

Age of the child at the time of parental loss was analysed in three categories: 0–5 years, 6–11 years and 12–17 years. All analyses were conducted using SAS version 9.4 (SAS Institute, Inc, Cary, NC).

Results

Among the 862,554 individuals included in the study population, 9,540 children (1.1%) experienced the loss of a mother, and 22,313 children (2.6%) experienced the loss of a father during childhood. Having lost both parents was uncommon; only 519 children experienced the death of both parents

before their 18th birthday. Deaths caused by external factors were more common for paternal death (41.5%) than for maternal death (25.7%) and also more common among younger children (Table 1). Parental educational level was lower, and substance abuse, psychiatric disorder and criminality in the surviving parent were more common among children who lost a parent, and particularly common among those who lost a parent due to external causes of death, compared with the rest of the population (Table 1). Child welfare interventions were more common among children with experience of parental death compared with the rest of the population and particularly common for parental death from external causes (Table 1).

Hospital admissions and outpatient care for depression were more common among bereaved individuals, and consistently more common among those who lost a parent due to death from external causes, compared with deaths from natural causes (Table 2). About 3–4% of men and women with experience of parental death from external causes had been admitted to hospital with a diagnosis of depression at least once during follow-up. Corresponding numbers in the nonbereaved group were 2.0% among the women and 1.1% among the men. Outpatient care was also more common for children with experience of parental death; about 11% of the women and 8–9% of the men, compared with 6.2% of the women and 3.6% of the men in the reference group. Particularly high rates were seen for children whose parents had indications of substance abuse, a psychiatric disorder or criminality or if the parent received social welfare (Table 2).

Similarly, there was an increased risk of hospitalization for depression in young adulthood associated with maternal (HR, 1.43; 95% CI, 1.24–1.64) and paternal (HR 1.63, 1.50–1.78) death during childhood (all causes of death, $p = .108$). The risk of hospitalization for depression associated with the death of both parents (HR, 1.67; 95% CI, 0.97–2.88) did not differ significantly from the risk in individuals who lost one parent ($p = .656$). In a similar manner, risk of outpatient care for depression was equally increased for maternal (HR, 1.36; 95% CI, 1.26–1.48) and paternal (HR, 1.44; 95% CI, 1.37–1.52) death (all causes of death, $p = .260$). A significantly higher risk of outpatient care for depression was seen in individuals exposed to the death of both parents during childhood (HR, 2.14; 95% CI, 1.63–2.80, $p = .003$).

Parental death due to external causes was associated with higher HRs of hospital admissions and outpatient care for depression, compared with deaths from natural causes (Table 3). HRs of hospital admissions because of depression were 3.23 (95% CI, 2.38–4.38)/HR 2.55 (95% CI, 2.15–3.03) in men and 1.79 (95% CI, 1.30–2.47)/HR 2.07 (95% CI, 1.78–2.41) in women (maternal/paternal deaths). HRs were somewhat decreased after adjustment for socioeconomic and sociodemographic confounders

Table 1 Characteristics of the study population

	No parental death	Maternal death natural causes	Maternal death external causes	Paternal death natural causes	Paternal death external causes
No. of individuals	831,220	7,084	2,456	13,049	9,264
Sex					
Men	51.8	51.9	51.8	51.9	51.1
Women	48.2	48.1	48.2	48.1	48.9
Age at parental death					
0–5 years	–	14.3	20.8	15.7	26.2
6–11 years	–	30.4	33.6	30.7	32.0
12–17 years	–	55.2	45.7	53.7	41.8
Mother's highest education					
Compulsory school ≤9 years	24.2	–	–	32.9	32.4
Secondary school	48.0	–	–	45.1	48.4
University <3 years	13.4	–	–	10.3	9.8
University ≥3 years	14.4	–	–	11.8	9.5
Father's highest education					
Compulsory school ≤9 years	31.3	36.6	35.0	–	–
Secondary school	44.0	41.7	43.4	–	–
University <3 years	10.2	8.1	8.7	–	–
University ≥3 years	14.5	13.6	12.9	–	–
Indicators of psychosocial problems in the family (before child aged 18)					
Mother substance abuse	0.7	–	–	1.9	3.6
Mother psychiatric disorder	2.8	–	–	4.7	6.3
Mother major crime	0.2	–	–	0.6	1.3
Social welfare recipient	7.0	–	–	9.4	14.0
Father substance abuse	2.1	4.2	9.5	–	–
Father psychiatric disorder	2.1	3.3	7.0	–	–
Father major crime	3.2	4.7	10.9	–	–
Received social welfare	5.7	8.1	12.3	–	–
Child welfare interventions	3.4	17.2	34.9	11.4	18.7

Numbers are percentages unless otherwise indicated.

Table 2 Rates of hospital admissions and outpatient care for depression

	Hospital admissions		Outpatient care	
	Men	Women	Men	Women
No parental death	1.1 (4,619)	2.0 (7,901)	3.6 (15,639)	6.2 (24,795)
Parental death				
Maternal death natural causes	1.3 (48)	2.3 (78)	4.7 (173)	7.3 (250)
Maternal death external causes	3.7 (47)	3.6 (43)	9.0 (115)	11.2 (133)
Paternal death natural causes	1.5 (98)	2.4 (152)	4.8 (327)	7.3 (457)
Paternal death external causes	3.0 (141)	4.2 (190)	7.5 (353)	10.7 (485)
Both parents died	3.9 (11)	1.7 (4)	10.0 (28)	10.4 (25)
Child age at parental death				
Mother dead at 0–5 years	2.1 (17)	3.7 (27)	7.0 (56)	8.9 (64)
Mother dead at 6–11 years	1.7 (26)	2.5 (37)	5.6 (86)	8.0 (116)
Mother dead at 12–17 years	2.0 (52)	2.4 (57)	5.6 (146)	8.4 (203)
Father dead at 0–5 years	2.7 (61)	3.5 (76)	6.9 (157)	9.8 (214)
Father dead at 6–11 years	1.9 (66)	3.6 (124)	5.8 (206)	9.1 (312)
Father dead at 12–17 years	2.0 (112)	2.7 (142)	5.6 (317)	8.0 (416)
Mother psychopathology				
Substance abuse	3.4 (121)	4.8 (172)	8.4 (303)	13.0 (467)
Psychiatric disorder	2.6 (333)	4.4 (547)	7.4 (940)	11.7 (1,460)
Major crime	2.3 (24)	5.2 (57)	7.6 (79)	14.4 (157)
Mother received social welfare	2.4 (737)	3.8 (1,141)	7.0 (2,160)	11.4 (3,383)
Father psychopathology				
Substance abuse	2.8 (287)	3.8 (391)	7.5 (770)	11.1 (1,144)
Psychiatric disorder	2.6 (257)	4.2 (414)	7.9 (769)	11.0 (1,071)
Major crime	2.4 (357)	3.6 (525)	6.5 (959)	10.8 (1,588)
Father received social welfare	2.2 (544)	3.5 (821)	7.0 (1752)	10.4 (2,438)

Data are presented as percentages and numbers in parenthesis.

Table 3 Parental death and HRs of hospital admission and outpatient care for depression

	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Hospital admissions				
No parental death	1	1	1	1
Mother's death, natural	1.13 (0.83–1.53)	1.03 (0.76–1.40)	1.20 (0.95–1.50)	1.19 (0.94–1.49)
Mother's death, external	3.45 (2.55–4.68)	3.23 (2.38–4.38)	1.90 (1.39–2.59)	1.79 (1.30–2.47)
Father's death, natural	1.28 (1.04–1.58)	1.17 (0.95–1.44)	1.27 (1.08–1.49)	1.21 (1.03–1.43)
Father's death, external	2.78 (2.34–3.30)	2.55 (2.15–3.03)	2.16 (1.86–2.51)	2.07 (1.78–2.41)
p-value*	<.001	<.001	<.001	<.001
Outpatient care				
No parental death	1	1	1	1
Mother's death, natural	1.23 (1.05–1.44)	1.19 (1.02–1.40)	1.18 (1.04–1.35)	1.15 (1.01–1.31)
Mother's death, external	2.49 (2.04–3.04)	2.37 (1.94–2.90)	1.79 (1.48–2.15)	1.73 (1.43–2.08)
Father's death, natural	1.31 (1.17–1.47)	1.26 (1.12–1.41)	1.19 (1.08–1.31)	1.14 (1.03–1.25)
Father's death, external	2.06 (1.85–2.30)	1.97 (1.77–2.20)	1.76 (1.60–1.93)	1.71 (1.56–1.88)
p-value*	<.001	<.001	<.001	<.001

Values are expressed as hazard ratios (95% confidence intervals). Model 1 is adjusted for year of birth. Model 2 is adjusted for year of birth, region of domicile, parental country of birth and parents' highest educational level.
*p-Values for test of difference between types of parental death.

(Table 2). Parental death during childhood was also associated with increased risk of outpatient care for depression, although on a lower level (Table 2). Additional adjustment for social welfare and psychosocial covariates in the surviving parent (as potential mediators and/or confounders) slightly attenuated the risk estimates but did not change the overall pattern (not shown). The effect of parental death from external causes (both maternal and paternal death) on risk of hospitalization and outpatient care for depression differed significantly between men and women ($p < .001$).

We separately analysed childhood parental death from suicide in relation to risk of depression in young adults. These deaths constituted 46% of external maternal deaths and 39% of external paternal deaths. Risk estimates were overall similar to estimates in relation to external deaths, for example HR of hospitalization for depression was 2.36 (95% CI, 1.74–3.21) for maternal death and 2.60 (95% CI, 2.21–3.05) for paternal death (fully adjusted models).

Results from analyses of the importance of the child's age at the time of death of the parent are given in Table 4. Losing a parent before school age was

Table 4 Age of child at the time of the parent's death (all deaths combined) and HRs of hospital admission and outpatient care for depression

	All		Men		Women	
	Model 1	Model 2	Model 2	Model 2	Model 1	Model 2
Hospital admission						
No parental death	1	1	1	1	1	1
Parental death 0–5 years	2.01 (1.73–2.34)	1.88 (1.62–2.20)	2.31 (1.83–2.90)	2.08 (1.65–2.63)	1.84 (1.51–2.34)	1.76 (1.44–2.16)
Parental death 6–11 years	1.68 (1.48–1.90)	1.58 (1.39–1.80)	1.60 (1.29–1.99)	1.45 (1.16–1.80)	1.70 (1.46–1.99)	1.65 (1.41–1.94)
Parental death 12–17 years	1.53 (1.38–1.70)	1.45 (1.30–1.62)	1.85 (1.58–2.16)	1.69 (1.44–1.98)	1.35 (1.17–1.55)	1.31 (1.13–1.51)
Outpatient care						
No parental death	1	1	1	1	1	1
Parental death 0–5 years	1.69 (1.54–1.85)	1.62 (1.47–1.78)	1.87 (1.63–2.15)	1.79 (1.56–2.06)	1.57 (1.39–1.77)	1.51 (1.33–1.71)
Parental death 6–11 years	1.50 (1.39–1.62)	1.42 (1.31–1.53)	1.59 (1.41–1.78)	1.47 (1.30–1.65)	1.44 (1.30–1.59)	1.38 (1.25–1.52)
Parental death 12–17 years	1.41 (1.33–1.50)	1.35 (1.26–1.43)	1.55 (1.41–1.70)	1.47 (1.33–1.62)	1.33 (1.23–1.44)	1.27 (1.17–1.38)

Values are expressed as hazard ratios (95% confidence intervals). Model 1 is adjusted for year of birth. Model 2 is adjusted for year of birth, region of domicile, parental country of birth and highest educational level of the surviving parent.

associated with higher risks of both hospitalization (p = .006) and outpatient care (p = .001) for depression compared with losing a parent as a teenager (all causes of death). HRs of hospitalization for depression after the death of a parent at ages 0–5 years were 2.08 (95% CI, 1.65–2.63) in men and 1.76 (95% CI, 1.44–2.16) in women, with similar risk estimates seen for outpatient care, although on a lower level (Table 4).

Discussion

In this register-based study in a national cohort of young adults, maternal and paternal death from external causes during childhood were associated with a two- to threefold increased risk of hospitalization and outpatient care for depression in men and a 70–100% increase in women. Parental death due to natural causes was associated with an increase of 15–25% of outpatient care for depression in both men and women.

One of the main results in this study is the great discrepancy between the strong association of depression with parental death due to external causes and with the comparatively small effect of death due to natural causes. There are at least two different mechanisms that can contribute to the understanding of the greater risk associated with external cause death. There are obvious links between psychiatric disorders and suicide death, but parental substance abuse is probably also an important risk factor to consider. These familial risk factors can influence the risk of depression in the offspring through heritable traits, and also the early childhood environment through an increased risk of abuse and neglect. Thus, the effect by parental death from external causes on adult depression may reflect a vulnerability to parental loss caused by social or genetic risk factors preceding the death as well as the death per se. It also seems probable that the sudden and unexpected nature of external cause deaths may have a stronger impact on the child and its immediate supportive network than a natural cause death, where there has often been some time for the child and the network to prepare for the consequences of the loss. Some parental external cause deaths may also occur in the presence of the child, with the development of posttraumatic stress (Eth & Pynoos, 1994).

The small risk increase in relation to death from natural causes indicates that there may be a small effect of the death itself. This association is probably to a lesser extent attributable to unfavourable factors preceding the death. We saw stronger associations with hospital admissions for depression in children who lost a parent in very young ages, compared with individuals losing a parent as a teenager. A large part of parents of younger children die from external causes of death, but these findings may also be interpreted in the light of neurobiological studies showing that there are early windows of vulnerability during which the developing brain is more sensitive to adversity and stress (Kaufman & Charney, 2001; Lupien, Mcewen, Gunnar, & Heim, 2009). These findings are also in line with psychological models and attachment theory, according to which parental attachment is particularly strong during young ages (Bowlby, 1970). Loss of security, stability and predictability of family routines may give rise to several emotional, social and behavioural problems that can continue to influence psychological health throughout the life course. Adverse experiences and stress at key periods in life could modify the development

trajectory of the brain leading to effects that emerge at a later period, and loss of a secure relationship with adult caregivers could be especially disruptive and difficult among young children.

Adjustment for socioeconomic factors, that is education of the surviving parent, which should be relatively unaffected by a parent's death and social welfare benefits in the surviving parent (as an indicator of the postdeath economic status of the family), had little influence on the risk estimates. Postdeath family psychosocial factors, such as family instability, increased psychopathology in the surviving parent and negative effects on parenting could also influence these associations. There was a strong association between parental death, especially from external causes, and indicators of psychosocial psychopathology in the surviving parent. However, adjusting the analyses for psychiatric disorder and substance abuse in the surviving parent only had a small effect on the risk for depression associated with childhood parental death. Finally, the findings of our study suggest that parental deaths, primarily due to external causes, were associated with both outcomes studied, that is hospital admission and outpatient care, although associations with hospitalization were stronger. This indicates that parental deaths influence both milder forms and more severe forms of depression.

Strengths and limitations

The use of national registers in this study made it possible to study an entire national cohort with minimal attrition. The use of outpatient as well as inpatient data made it possible for us to compare outcomes in more severe forms of depression with the more common and less severe forms of depression treated in outpatient care. It is well known, however, that many cases of depression are treated in primary care only or not at all. This makes it probable that our results to some unknown extent are affected by referral bias.

Our study population (n = 862,554) was nested within 607,213 families and we accounted for sibling correlation and nesting within families both within the Cox regression model and also by additional analyses, where we included only the first-born child in each family. Results from these analyses were similar to the results for the total study population, indicating that nesting was nothing but a minor problem in this large study population.

This study was conducted in Sweden, a Nordic welfare state with a comparatively strong economic societal safety net for families that lose a breadwinner, and where the main costs for the hospital care of a dying parent are covered by the society. Thus, our results cannot automatically be generalized to parental losses in societies that do not provide such societal benefits.

Implications

Our results indicate that children who experience parental death from external causes have a considerable risk increase for clinical depression, and particularly for the more severe forms of depression that lead to hospital admissions. Children who experience these losses should be given priority in preventive interventions after parental loss. Decisions about treatment following loss of a parent to natural causes should be individualized.

Conclusions

The results from this study indicate that parental loss to death during childhood per se is associated with a small increased risk of long-term consequences for psychological health in Sweden. Children who lose their parents to death from external causes are, however, at particular risk due to the combination of familial risk factors with the loss itself.

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Key points

- Previous evidence on long-term consequences of childhood parental death on mental health is conflicting.
- Our results demonstrate a discrepancy between a small increase in risk for depression in young adulthood after childhood parental loss to death in natural causes and a much higher risk associated with parental death in external causes.
- Children who lose their parents to death from external causes are at particular risk due to the combination of familial risk factors with the loss itself.
- The high risk for depression in young adulthood after childhood parental death from external causes suggests that these children should be given priority in preventive interventions after parental loss.

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