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**TEENAGERS LOSING A PARENT TO
CANCER: EXPERIENCES, MODIFIABLE
RISK-FACTORS AND LONG-TERM
OUTCOME**

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It is better to talk badly about things than not to talk about them
at all

Serge Tisseron

Ask! It is better to show lack of knowledge for 20 second than
to remain ignorant the rest of your life

Gunnar Steineck

ABSTRACT

Background: We investigated the experiences of cancer-bereaved teenagers. The goal was to identify potentially modifiable risk-factors for long-term psychological consequences and thus be able to guide health-care providers in ways to support bereaved-to-be teenagers.

Subjects and Methods: A study-specific questionnaire was made based on semi-structured interviews with cancer-bereaved youths and tested for face-to-face validity. Through population-based registers, we identified cancer-bereaved children in Sweden who at age 13 to 16 had lost a parent to cancer between 2000 and 2003. Children had to have been living with co-habiting parents, been born in a Nordic country and have an identifiable telephone-number. Out of 851 eligible cancer-bereaved youths, 622 (73%) participated by answering our questionnaire. Registers also provided us with a matched group of non-bereaved youths among which 330 of 421 (78%) participated by answering a less extensive but otherwise identical questionnaire. Data collection went on between February 2009 and March 2010. Participants were between 18 and 25 years of age and parental loss had occurred six to nine years earlier.

Results: Twenty percent of cancer-bereaved youths reported having had a period when they deliberately self-injured, compared with 11% in the non-bereaved group. Adjusting for sex/gender, childhood self-destructive behavior, bullying, physical or sexual abuse, and having had no one with whom to share joys or sorrows, increased the odds ratios from 2.0 to 2.3. Among family- and health-care related and possibly modifiable factors associated with self-injury in univariable analysis, we identified *poor family cohesion before* (RR, 3.4) and *after* the loss (RR, 3.5); *distrust* (RR, 1.7); *perceived poor efforts to prevent suffering* (RR, 1.6); and *poor efforts to cure* (RR, 1.5). Associations with family cohesion were decreased but remained statistically significant after adjustments for multiple variables, including sex/gender, having been subjected to sexual or physical abuse, and depression. For health-care related factors the associations were attenuated.

Eighty-two percent of participants reported moderate to very much trust in the care that was provided to the dying parent. In this group, 11% had moderate to severe depression at time of follow-up, compared with 25% among cancer-bereaved youth reporting distrust (no or little trust) (RR, 2.3). The risk of distrust (no to little trust) was highest among those who never received any end-of-life information (RR, 2.5), those informed only afterwards (RR, 3.2) and those how don't know or remember if end-of-life medical information was given (RR, 1.7). Other important risk-factors for distrust were perception of poor health-care efforts to cure the parent and poor relationship with the well, surviving parent. Ninety-eight percent reported the opinion that teenagers about to lose a parent to cancer should be told when death is imminent. Among 367 (60%) who had been told, 62% were told by parents, 11% by parents together with health-care professionals, and 14% by health-care professionals alone.

Mutual pretending and lack of awareness that death was near were prominent reasons for not talking about death in the family. Forty-four percent of the teenagers realized that death was imminent on the last day, half of them only hours before the loss. An additional 19% never realized it.

Conclusions: Self-injury is twice as common in cancer-bereaved youth. Poor family cohesion before and after the loss are important risk-factors for self-injury. The influence of perceptions of poor quality care varies with family cohesion, life-time adversities and depression. One fifth of cancer-bereaved youth reported distrust in the health-care provided in the final week of the dying parent's life. End-of-life information by a physician before the loss lowered the distrust in health-care. Almost all teenagers want to know when a parent's death is imminent but many are never told.

LIST OF PUBLICATIONS

- I. **Bylund Grenklo T**, Kreichbergs U, Hauksdóttir A, Valdimarsdóttir UA, Nyberg T, Steineck G, Fürst CJ. Self-injury in teenagers who lost a parent to cancer: A nation-wide population-based long-term follow-up. Arch Pediatr Adolesc Med. Online first December 3, 2012/JAMA Pediatr 2013;167(2):133-140.

- II. **Bylund Grenklo T**, Kreichbergs U, Valdimarsdóttir UA, Nyberg T, Steineck G, Fürst CJ. Communication and trust in the care provided to a dying parent. A nation-wide study of cancer-bereaved youths. J Clin Oncol Online first July 15, 2013.

- III. **Bylund Grenklo T**, Kreichbergs U, Valdimarsdóttir UA, Nyberg T, Steineck G, Fürst CJ. Self-injury in parentally bereaved youth: The impact of health-care and family-related factors. (Submitted manuscript) 2013.

- IV. **Bylund Grenklo T**, Uggla Sköldebrant C, Kreichbergs U, Valdimarsdóttir UA, Nyberg T, Steineck G, Fürst CJ. Being told about the imminent death of a parent: a nationwide study of cancer-bereaved youth's opinions and experiences (Manuscript)

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LIST OF ABBREVIATIONS

BMA	Bayesian Model Averaging
CI	Confidence Interval
ICD	International Classification of Diseases
OR	Odds Ratio
RR	Risk Ratio

1 INTRODUCTION

I am a behavioral scientist with a focus on psychology. I am also a survivor of parental cancer-bereavement. I grew up with parents who were health-care professionals, I worked extra as a nurse aid and have always been intrigued by the social support provided in times of crises, in particular in health-care and hospitals where varying levels of trauma are handled and experienced by professionals, patients and family members. My personal experiences as well as my professional background have made me a firm believer in the extreme importance of the provision of support and information.

At the end of my university education I carried out a qualitative study of the social support provided by a doula (i.e. a designated support person) during childbirth at the same time that I became employed as a project manager working with evidence-based medicine at the Swedish Council of Health Technology Assessment (SBU). Several years later while in the laundry room in my apartment building (there is such a room in every block of flats in Sweden), I had an interesting talk with a new neighbor. She had recently received her PhD on a project focusing on cancer-bereaved widows. Her name was Unnur Valdimarsdóttir and she introduced me to the research group of Clinical Cancer Epidemiology at Karolinska Institutet and to the Department of Research and Development at Stockholms Sjukhem Foundation.

In Sweden with a population of just over 9 million, 23 000 people died of cancer which is the second leading cause of death ¹. While the majority of individuals that die from cancer are older than what can be considered typical parenting ages (e.g. 80% >64) ¹ a number of the dying cancer-patients do have minor, dependent children at home.

Approximately 3 500 (0.2%) children in Sweden lose a parent to death each year ² and an estimated 40% (n = 1 400) of these are attributable to cancer (ICD:C00-97) ¹. Our knowledge regarding the experiences of teenagers that are about to or already have been bereaved of a parent to cancer is limited and so too is our understanding of risk-factors additional to the loss.

This thesis is based on a nation-wide population-based project including children who lost a parent to cancer when they were teenagers aged 13 to 16. At the time of follow-up in 2009 they were aged 18 to 25 and had been bereaved for six to nine years.

2 BACKGROUND

2.1 THEORETICAL FRAMEWORK

2.1.1 Stress, coping, social support and health

The research project on which this thesis was based is theoretically based on stress and coping theories. These are derived from research from different disciplines, ranging from biology and psychophysiology to environmental and social psychology. The “fight-or-flight response” was described by Walter Bradford Cannon who in the 1930s directed his research to the physiological reaction to environmental stimuli³. In the 1950s, Selye contributed with the realization that besides physiological reactions there were also behavioral reactions to stress⁴. However, individuals evidently vary in their reactions to stressful stimuli and research focus turned to how the stressor was perceived (appraised) and coped with. According to Lazarus and Folkman, a person experiences stress in a situation where there is an imbalance between external demands and internal capacity, i.e. when the individual perceives that the external demands seriously tax or exceed her coping capacities⁵.

According to the stress and coping paradigm the association between life stressors and impaired mental or physical health is influenced by coping mechanisms^{5,6} having either a direct or a buffer effect on health⁷. Coping strategies can be either avoidant or attentive and social support is one of the major resources used for *attentive* coping with stress. Folkman and Lazarus propose that coping can have two different functions while social support usually is divided into 3 – 4 different types, the one labeled affirmative support is the least well-defined^{7,8}. The overlap of types of social support and types of coping can be described as in the panel below.

COPING FUNCTIONS	SOCIAL SUPPORT
Problem-focused coping Dealing with the problem that causes stress	Informational support Provision of information and advice that can be used in problem-solving or to adjust to a changing situation. Instrumental support Practical help, aids and services
Emotion-focused coping Dealing with the emotions that the stress give rise to	Emotional support Emotional sustenance, support that makes the receiver feel love and belonging Appraisal or affirmative support Information that is used for self-evaluation, feedback, social comparison.

2.2 GRIEF AND GRIEF-RELATED NEGATIVE OUTCOME

Grief is a normal reaction to the loss of a loved one. It is often a prolonged and extremely painful condition in which it is common to experience crying, depression, rumination, guilt, anxiety, anger, hallucinations and emotional numbness⁹. Most bereaved individuals will recover even if life is forever changed. However, the loss of a loved one is a major stressful life event¹⁰ and a minority of the bereaved, both adults and children, are at risk of long-term psychological and physical morbidity^{9,11-13} and even mortality^{14,15}.

2.2.1 Teenage

Teenage refers in English to the suffix “teen” in the numbers thirteen to nineteen while *adolescence* refers to the physical, psychological and social changes of the time period. Teenage and adolescence substantially overlap in time and both denominate the transitional period between childhood and early adulthood. This is a time period when the maturing individual becomes more and more autonomous and independent from the parents, a period when peer relationships become increasingly important¹⁶⁻¹⁹.

In a Clinician’s Corner article Grace Christ writes that the grief reactions of bereaved adults and teenagers (and younger children) are likely to be out of step with each other. Unlike adults whose grief reactions tend to be sustained over time the teenager’s reactions are often intermittent and can recur throughout life, i.e. re-grief phenomena^{17,20}. This increases the risk of misunderstandings on the part of the adult that the teenager already has adjusted, potentially leading to withdrawal of support, while the teenager might be very worried over the distressed surviving parent¹⁷.

The premature loss of a parent is recognized as one of the most traumatic experiences a child can encounter. The literature regarding the impact of parental bereavement on the child’s mental health and functioning in the short and long-term is extensive but inconsistent^{e.g. 11,21,22}. In part, inconsistencies can be explained by methodological issues, sampling strategies, sample sizes, lack of control groups, various follow-up times (ranging from weeks to decades), inclusion of different types of losses (i.e. including divorce and loss of pets), and different causes of death.

Without restricting to cancer as the cause of parental death, in large observational studies with control groups and > 12 months follow-up, parentally bereaved children (ages 6-25) have been found to be: more socially withdrawn, have more anxiety, depression and problems of clinical significance than controls, differences were evident at 24 months post-loss but not at 12 months²³; to be more impaired with psychopathology than controls but less impaired than depressed children²⁴, to have higher rates of major depression, alcohol and substance abuse²⁵, and conduct disorder and functional impairment²⁶.

In 2011 three large Nordic register studies were published that focused on the effect of parental death on suicidal phenomena and death in the offspring^{e.g. 15,27,28}. In 897 305 Swedish children aged 10 to 19, there was a statistically significant increase in mortality in sons who had lost a mother more than 5 years earlier, sons who lost a father in the preceding year, and in daughters who lost a mother at any time during the preceding 4 years compared to non-bereaved children of the same ages. Separating results into natural and unnatural causes showed no statistically significant elevation of risks in natural deaths including cancer¹⁵. In Danish youth (aged 17-23) who had attempted suicide it was found that parental death was more common than in non-suicide attempters, including parental deaths from natural causes (OR 1.6)²⁷. In 17159 Swedish young adults who had been hospitalized for attempted suicide it was found that parental cancer deaths increased the risk of offspring suicide attempt (adjOR 1.3)²⁸.

2.2.2 Self-injury

“In 8th grade I was more or less apathetic....I had built the highest walls around me to stop the grief from gushing out and would really have needed someone who dared to stay with me and to knock those walls down! It all escalated into a rather serious self-injurious behavior.”

Daughter who lost her mother to lung cancer eight years earlier at age 11.

The terminology and definitions used for the acts of deliberate destruction of body tissue and other ways of harming oneself varies between research groups. Broadly speaking, *self-injury* refers to deliberate self-destruction by for example cutting and burning, while *deliberate self-harm* (DHS) includes self-poisoning to self-injury²⁹. Further, some research groups distinguish the suicidal or non-suicidal intent from the behavior, i.e. non-suicidal self-injury NSSI³⁰.

Since self-injury often is a concealed or hidden behavior and there is a lack of consensus regarding its definition^{31,32}, the precise prevalence cannot be determined. Self-reported rates in European community youth samples have varied between 6%³³ and 40%³¹. Self-injury will rarely come to the attention of health care and be registered; of all teenagers that had cut themselves, only 6.3% of English and 14.7% of Norwegian teenagers had their wounds tended to at a hospital^{34,35}. The most frequently cited reasons to self-injure are to regulate affect (feeling overwhelmed, anxious, tense) and to regulate dissociation (feeling numb, unreal)^{36,37}. Self-injury ranges from mild to severe and repeated behavior^{30,34}. In association with many suicide attempts there is a history of previous self-injurious acts^{38,39} and in depressed youth a higher risk for suicide attempts was reported among those who had a history of self-injury than among those with no previous self-injury⁴⁰.

High-risk populations for self-injury are teenagers and young adults^{30,41,42}. Risk-factors for the behavior include sex/gender, depression and anxiety, having been subjected to bullying^{e.g. 29,33,43-46}. In the bereavement literature, reports of self-injury

have been scarce and restricted to ritualistic behavior in non-western cultures⁴⁷. Still, childhood traumatic experiences such as parental deprivation, separation and deliberate maltreatment (sexual and physical abuse) are salient in research on suicidal phenomena including the study of self-injury^{34,48}.

2.3 RISK FACTORS OF LONG-TERM PSYCHOLOGICAL MORBIDITY

2.3.1 Additional and potentially modifiable risk factors

Not everyone that has been exposed to the loss of a loved one through death is at risk for increased morbidity and mortality. Varying with the cause of death there are factors additional to the loss that can explain part of the negative impact on health. In bereaved adults some of the classical risk-factors have to do with the circumstances of the loss and include deaths that are *sudden, unexpected* and *untimely*¹².

In the research group of Clinical Cancer Epidemiology, Karolinska Institutet, a number of studies on additional and modifiable risk factors in cancer-bereaved family members have been finalized and reported⁴⁹⁻⁵⁵. For example, a study by Valdimarsdóttir and coworkers included 379 cancer-bereaved widows. It was found that the risk for long-term depression and anxiety was increased in those who had less than 24 hour's awareness time (i.e. the length of time before the loss that the woman was aware that her husband would die from the disease) and for those whose dying husband had been anxious in the last month of life^{52,53}. A study by Hauksdóttir and coworkers included 691 widowers. Building on the findings regarding awareness-time, this project focused on predictors and consequences of level of preparedness for the loss of the wife. Findings indicate that low preparedness increased the risk of anxiety, emotional numbness and having difficulty falling asleep still four to five years after the loss⁴⁹. Two projects have been carried out within pediatric care. Kreichbergs and coworkers included 449 bereaved parents and focused on the consequences and risk-factors additional to the loss of a child to cancer. The results showed, for example, that parents who had not talked about death with their dying child, despite having sensed that the child him- or herself was aware of the imminent death, often regretted that they hadn't talked. This was associated with an increased risk of anxiety four to nine years after the loss⁵¹. The researchers also investigated the impact of other potentially modifiable health-care related factors such as having experienced unrelieved pain or negligent care of the child. It was found that between 32% and 57% of parents were moderately or much affected by these stressors at time of follow-up, still two to nine years after the loss⁵⁰. Eilegård and coworkers included 174 siblings who at age 12 to 25 had lost a brother or sister to cancer. Result showed that avoiding to talk about the lost sibling with the parents, in respect of their feelings, was associated with an increased risk of anxiety two to nine years after the loss⁵⁵.

2.3.2 Information and communication between adults

Information from and communication with health-care professionals are key issues in incurable terminal illness since attention to these has the obvious potential to modify

perceived suddenness, unexpectedness, short awareness, low preparedness and lack of family communication, and thus possibly the long-term psychological distress at least in the bereaved adult^{49,51,53,56,57}. However, giving and receiving end-of-life information (i.e. what is sometimes called breaking bad news, truth-telling, prognostic information) is a complex matter even among adults and is not always successfully carried through⁵⁸⁻⁶⁵. For example, communication between physicians and patients might be hampered by physicians' attempts to protect and shield the patient from distressful news, in accordance with the belief that "No news is good news"⁶¹. A review of 13 studies of patient's information preferences in late illness showed that all wanted honest broad information but not everyone wanted detailed quantitative information. The latter could threaten the sense of hope⁶⁶. Physicians might avoid, delay or withhold information from patients because of lack of training, high workload including not having time to take care of the patient's emotional reactions, fear of harming the patient and the unpredictable nature of the disease⁶². In an interview study of patients, family members and health-care professionals, four different courses of action on when and how end-of-life communication could be initiated were found. Most participants preferred that health-care professionals offered all patients and family members the opportunity to talk by raising the issue. Alternative ways were that professionals waited for the patient or family member to raise the issue; raised the issue when patient and family members needed to know; or seemed ready for it⁵⁹. In a study of adult family members, some responding to a questionnaire and some interviewed about communication with the physician at the end-of-life, it was found that many family members reported not to have been informed about incurability and life expectancy. Still, many family members acknowledged that there was a conflict between on one hand wanting to know and on the other accepting and understanding the distressing information⁵⁸. Finally, end-of-life communication *within* the family is frequently problematic and reasons for this can be the wish to avoid distressing the other, a desire for mutual protection and a belief in positive thinking, i.e. hope⁶⁵. To further complicate matters, a systematic review found that at the end, patients wanted less while family members needed more information⁶⁷.

2.3.3 Information and communication between health-care professionals and teenage family members

Very few studies focus specifically on teenagers and young adults who have lost a parent to cancer. In this group however, the need for knowledge, information and family communication is prominent. For example, Patterson and Ranganathan included 34 adolescents (aged 12-17) and 28 young adults (aged 18-23 years) in a survey study about their needs. Information about the disease, its treatment and what had happened were frequently noted⁶⁸. In an interview study with five teenagers (aged 14-17) of the experiences of parental terminal cancer and death, adolescents described both a striving to understand what was happening and trying to avoid talking about it⁶⁹. In Kristjanson and coworkers qualitative study of 31 adolescent children whose mothers had breast cancer disease ranging from recently diagnosed to

advanced or terminal, it was concluded that the most salient need for information was that which concerned the mother's survival and most of participants did not have their informational needs met ⁷⁰. Adolescents appreciated professionals' straightforwardness, information in clear and simple language and being treated as adults. Further, many adolescents would have liked to have been given contact information to a professional that they could contact in case of need ⁷⁰. Both younger children and teenagers have expressed a desire for contact with someone outside the family who is knowledgeable and will not report on the conversation ⁷¹.

2.3.4 Adult trust in health-care

In a qualitative study of what problems physicians perceived when breaking bad news to the patient, Friedrichsen and Milberg identified the risks of losing control over one self, one's emotions and professionalism, and the risk of losing the patient's trust ⁷². Several definitions of interpersonal trust in health-care are available ^{73,74} often acknowledging the vulnerability of the patient ^{73,75,76}. According to these, central to the feeling of trust is the belief that the health-care provider is acting in the best interest of the patient ^{74,77}. For a patient or family member to trust a health-care provider, he or she should have for example the knowledge (expertise, competence, skill, performance) and the will (motivation, intent) to do what is needed ^{73,77}. In cancer patients in addition, a qualitative study identified the *need* to trust the physician as a central theme ⁷⁵. No doubt, trust is an important aspect of the patient-doctor relationship in particular in end-of-life care ^{75,76,78}. In a study of 440 patients with advanced disease (i.e. 50% probability of survival at 6 months) and their 160 family members, Heyland found trust in the treating physician to be rated as the most important qualities by both patients and adult family members ⁷⁹. Further, satisfaction with end-of-life care was highest in the group who remembered having had a prognostic discussion with the physician ⁸⁰. A very recent study by Smets and coworkers focused on radiation oncologists' communication with 111 patients. Specifically, the study focused on the effect on *trust of information content* (about radiotherapy, side-effects and prognosis) and *information giving performance* (asking for the patient's preferences, use of simple, understandable language, encouraging the patient to ask questions, and checking if the information given had been received). Results showed that patients' average trust-scores were high, 4.5 out of 5, regardless of information content and information performance which explained no more than 0.02% of the variance. The authors conclude that trust may not be the best measure of information-giving qualities ⁷⁶.

2.3.5 Health-care related risk-factors for children

We have been unable to identify any research into the issue of children's trust in the health-care provided to a dying parent, or *perception* of other aspects of the health-care. However, disease and treatment variables such as cancer type and stage, time since diagnosis, type of treatment and side-effects have been included in a few studies of the impact of parental cancer. In this situation, Huizinga, Visser and coworkers found adolescent daughters functioning, as rated by the well parent, to be associated

with treatment intensity, and relapsing disease to be associated with self-rated functioning in adolescent sons⁸¹ but no association was found between intensity of treatment or time since diagnosis and stress response in children aged 11-23⁸².

2.3.6 Family-related factors

In children, the types of risk-factors for long-term mental health that have attracted most attention are family-related²², which is perhaps not so surprising considering that parents are children's main sources of support. More than 50 years ago, Hilgard and coworkers noted that the impact of bereavement on the child will depend on family relationships before and after the death⁸³. The aspects of parenting that have been studied include for example *parental indifference* (lack of interest in the child's school work, friends/boy/girlfriends, lack of regular meals, clean clothes), *parental control* (lack of involvement in manners and behaviors such as playing out in the street, going out with boys, returning late at night, free rein)⁸⁴; and *positive parenting* (caregiver warmth, consistent discipline, routines including fun and play-times, positive reinforcement, and sharing emotions with caregiver⁸⁵. Siegel and coworkers concluded that children's adjustment to the loss would depend on the surviving parents capability to provide physical and emotional support, an environment that permits expression of feelings, thoughts and fantasies about the loss, and stability⁸⁶.

The focus in many studies has been on the family environment *after* the loss. However, when death is caused by illness such as cancer the family members are also affected before the loss. Having to cope with the disease, possible side-effects of treatment and the potential threat to the patient's life, the parents might not be capable or available to provide emotional and informational support to their children. In a study of 103 well parents of children aged 7-16, it was found that 58% of fathers and 42% of mothers had scores of depressive distress that were clinically relevant⁸⁷. In a prospective study of 668 patients with advanced cancer disease a comparison was made between patients with and without dependent children. Results show that compared with other patients those who had dependent children had a higher risk for worry, panic, and preferred aggressive treatment before palliative care. Further, the well parents had a higher risk for depression and anxiety, than other spouses⁸⁸.

There are barriers to truthful end-of-life communication even when only adults are concerned^{59,60,62-64,67} and the situation is likely to be even more challenging when minor dependent children are directly involved. Children have been found not wanting to ask their parents to avoid distressing them⁷¹. Likewise, parents might also refrain from talking in an effort to protect the children from distress. In addition, reasons for parents to avoid or delay information are wanting to avoid questions about cancer and death⁸⁹, uncertainty about what is the optimal time to talk⁹⁰, and being unsure of what information is age-appropriate⁹⁰. Further, couples might not agree with each other when it comes to talking with the children. Notably, in a study of nine surviving parents with minor children nine qualitatively different approaches to preparing and talking about imminent death was identified⁹¹, including couples who agreed with each other to talk with the children, couples who agreed not to talk with

the children and couples who disagreed with each other about whether to tell the children or not. Here, it was found that the surviving parents tended to follow the wishes of the dying spouses⁹¹.

Still, it is not uncommon that parents with cancer express a need for professional advice and support in how to talk with the children^{86,89} and a study of 54 adolescents (aged 11-17) showed that healthy family functioning including open communication predicted less psychological distress in children whose parent has cancer⁹². The period before the loss is often the only time period when the health-care professionals caring for the patient meet the family members and this period is also associated with the occurrence of significant stress in the minor family members. For example, in a study 70 children (aged 7-17) that were losing a parent to cancer and 428 community controls it was found that the risk of depression and anxiety in the children whose parents had terminal cancer was statistically significant higher than in controls before the death but not 12 months afterwards⁹³. Even though it can be argued that this was a study of a family intervention program documenting evidence of a preventive effect on mental distress in the children 12 months after the loss, it points to the significant mental suffering of children whose parents are dying from cancer.

Taken together, problems related to the information given and the communication taking place when a parent is dying from cancer have inspired the design of a number of family-focused preventive programs starting *before* the loss of a parent to cancer. A shared goal of these programs is to increase knowledge and improve open and honest communication, about disease, death and emotional reactions, within the family⁹³⁻⁹⁵.

2.3.7 The present research project

From preparatory work (please see Methods section) at the research group of Clinical Cancer Epidemiology, we had indications that there might be an elevated risk of self-injury in cancer-bereaved youth both from interviews with cancer-bereaved fathers⁹⁶ and the youths targeted in this thesis.

A focus of the research resulting in this thesis was on additional and possibly modifiable risk-factors for teenagers as dealing with these might be a way to improve the care of families with teenage children where a parent is terminally ill with cancer, and thus possibly reduce the extreme pressure they are subjected to.

Prominent possibly modifiable risk-factors in the interviews were for example lack of full understanding about what had happened and why, a perception of that mistakes had been made and/or that limited efforts had been made to cure the parent, often expressed in relation to distrust in health-care. Further, several barriers to the reception of information about incurable disease and impending death were described. To give the reader an idea of how study participants experiences could be expressed examples of written comments are presented below:

"They didn't try hard enough"

Daughter who at age 15 lost her father
to gastrointestinal cancer six years earlier

"I don't for a second doubt that she had the best possible health-care. What has been upsetting is that not one of her health-care professionals volunteered to talk with us children! This heavy responsibility was dumped into my parents' laps and they couldn't deal with it. Which I perfectly understand!"

"I don't wish anyone the uncertainty that I felt. In my opinion, children should be given straight-forward information and answers and the responsibility for this should be on physicians and other health-care professionals"

Daughter who at age 16 lost her mother
to acute myeloid leukemia six years earlier

The potential effect of these kinds of experiences in cancer-bereaved teenagers has previously received marginal research attention.

3 AIMS

The overall aim of the research leading to this thesis was to increase our knowledge about the experiences of teenagers who lose a parent to cancer and about risk-factors for adverse effect that are additional to the loss and potentially modifiable by the health-care involved in the care of the ill parent.

The aims of the specific papers included in the thesis were to investigate:

- The risk of self-injury in cancer-bereaved compared to non-bereaved youth
- Associations between self-injury and possibly modifiable factors related to the family and health-care in bereaved youth
- Children's trust in the care that was provided to the dying parent in his or her final week of life. The impact of end-of-life medical information and other potential risk-factors for distrust
- Participating youths views, experiences and barriers to being informed and talk about a parents imminent death from cancer.

4 SUBJECTS AND METHODS

4.1.1 METHODS

This project like several earlier projects from the research unit at Clinical Cancer Epidemiology^{49,51,97,98} followed methodological routines established by Rådestad and coworkers⁹⁹ and recently described by Omerov and coworkers¹⁰⁰. These routines included the following broad phases: 1) A preparatory phase including the following: interviewing individuals from the population in focus and professionals with clinical experience in the area, reading the literature, formulating hypotheses and constructing a questionnaire to study the hypotheses, validating and making feasibility tests of the questionnaire, and 2) A main study phase for data-collection with the questionnaire.

4.2 PREPARATORY PHASE

The questionnaire used in this study was developed to test hypotheses derived from content analysis of semi-structured interviews with 16 individuals who had lost a parent to cancer (5 males, 11 females), input from experienced professionals, earlier projects in the research group of adult cancer-bereaved family members (widows, parents, widowers)^{49-51,53,54} and the literature. Parentally cancer-bereaved informants had answered to ads in one of two free-of-charge newspapers in the Stockholm area; *Metro* and *Stockholm City*. The loss of the parent had occurred when the informants were between the ages of 13 and 25. They had to be at least 18 years old at the time of interview, which was held two to 16 years post-loss. All interviews were conducted by Tove Bylund Grenklo in an office room at either the Karolinska Institutet or Stockholm Sjukhem and in one case at the informants' own work place. After providing thorough information about the study aim and participants' rights to refrain from participation at any point in time, the interview started with the question "*Tell me what happened to you and your parent*" followed by questions concerning experiences and understanding of events from the time of diagnosis of the disease, from treatment and care, from the time of death and afterwards. Participants were asked about how family members reacted, about meetings or other encounters with health-care professionals, and if and how life in school and with friends was affected. All interviews were tape recorded and transcribed verbatim by a professional medical transcriptionist. Additional interviews were held with experts in psycho-oncology, palliative care and the psychology of bereavement respectively.

Hypotheses were formulated from content analysis of interviews and previous findings from the research group at Clinical Cancer Epidemiology. To enable study of these hypotheses a draft of a questionnaire was prepared and subsequently tested for face-to-face validity to ensure that each question was understood as intended and that the response options provided were all-embracing. The face-to-face validity tests were carried out with 6 former and 9 new informants, recruited thru additional newspaper advertisements. Except for one participant who was 11 when her parent

died, the remaining participants in this phase were all between the ages of 13 to 16 at the time of loss.

37%	Cancer disease, health-care and death: type of cancer in parent, time with diagnosis, the time the teenager realized disease was incurable, that parent would die, death was imminent, teenager’s perception of health-care efforts, teenagers location at time of death, taking farewell before and after the loss, unanswered questions
28%	Other adversities and psychological and physical health: loss of sibling, grandparents, friends, subjected to bullying, abuse/assault, been prescribed medication for depression, anxiety, or sleeping difficulties, anger outbursts, emotionally numb, been unable to stop worrying the last month, PHQ-9 (validated scale for depression), number of visits with a physician the last year
12%	Family relationship and support: family cohesion, access to support and someone with whom to talk about deceased parent
9%	Demographics: year of birth and level of education of children and parents, residency, occupancy, birth order
7%	Loss and grief-related reactions: building a wall to manage to live on, worrying over surviving parent
4%	School: grades, support from school health-care, doing well in school
3%	Research participation: do you find this kind of research valuable, do you think you have been positively or negatively influenced by your participation in the short or long run.

Figure 1. Examples of questions and theme distribution in the questionnaire for cancer-bereaved.

The feasibility of data collection logistics, response- and participation rates were then tested in a pilot study. For this aim we included 103 individuals born 1982 – 85, 78 of whom had lost a parent to cancer in 1998, 17 who were non-bereaved, and an additional 8 with whom we never were able to establish telephone contact. The pilot study started in May 2008 and was prematurely terminated in September because we estimated that we could not reach a participation rate of 75%. Besides the fact we had chosen a suboptimal time of year for data collection (May, June, July and August), we found that many had taken two hours or more to respond to the questionnaire. Additionally, in some cases the participant had been unable to answer questions regarding for example the parent’s symptom and had instead drawn an extra box, ticked it, and written “I don’t know”.

4.2.1 The questionnaire for cancer-bereaved

To increase participation rates, the questionnaire for cancer-bereaved was reduced from 64 to 44 pages. The resulting questionnaire had 153 questions with in all 271 separate items. Most response options were fixed but there were also open response alternatives. For many questions we added the response option “I don’t know” and/or “I don’t remember”. Figure 1 shows the distribution of questions per topic.

The questions and their response options were set in specified time-frames to cover past as well as present time. “Have you had trouble concentrating during the previous month?”, “Have you ever been prescribed medication for depression?”, “Did you and your well parent talk about the imminent death in the final week of your ill parents life?”, “Where were you when your parent died?”, “Were you worried on behalf of your surviving parent, the first half year after the loss?”, “Have you been to the doctor this last year?”, Is there anyone with whom you can talk about your lost parent, today?”.

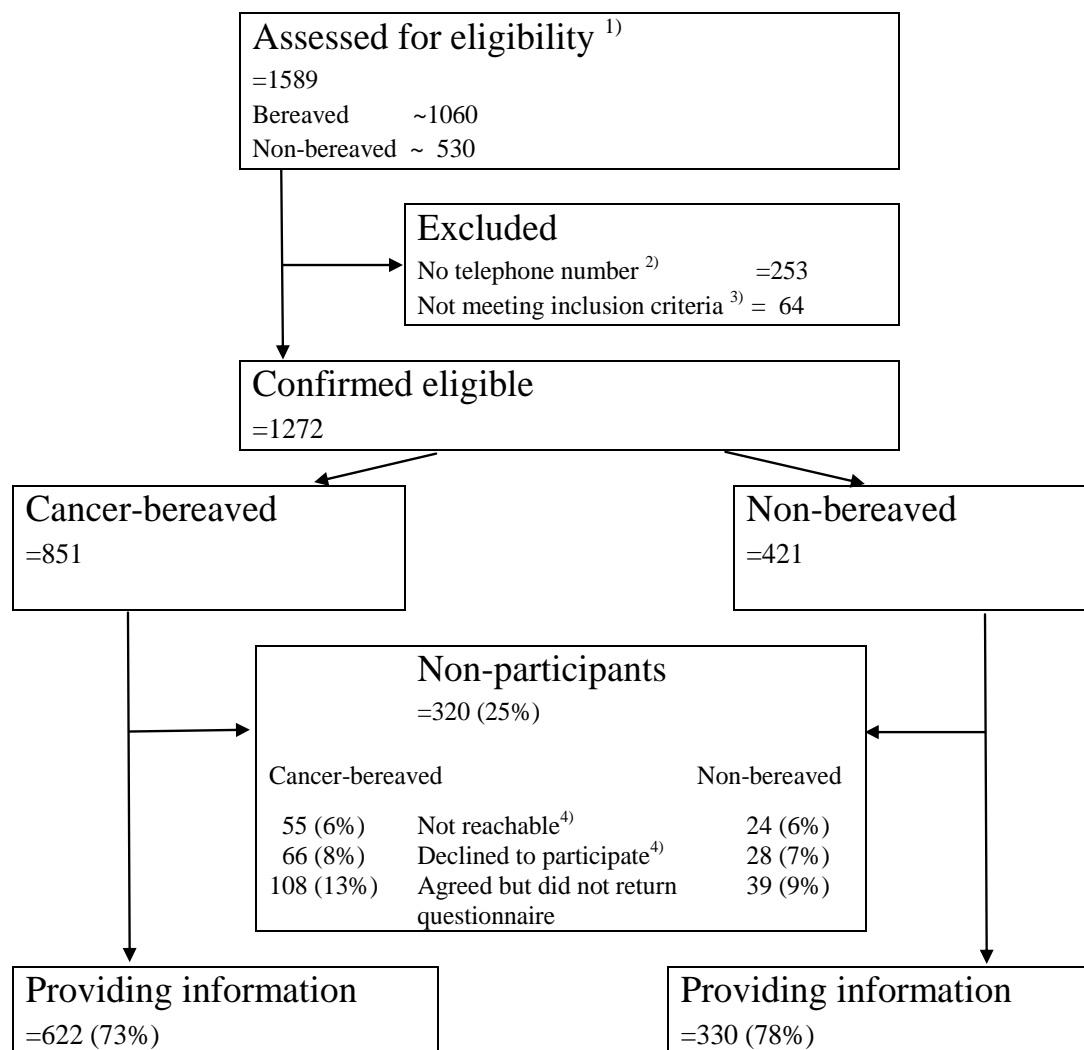
4.2.2 The questionnaire for non-bereaved

The questionnaire for non-bereaved youth ended up being 20 pages long. It contained questions identical to those for the cancer-bereaved except for the questions regarding parental cancer disease, health-care and bereavement. Questions were tested for face-to-face validity with two non-bereaved men in their mid-twenties.

4.3 MAIN STUDY PHASE

4.3.1 Participants

Deceased parents were identified in the Swedish National Causes of Death Register. Inclusion criteria were that the individual had died from cancer (ICD10; C:00-96) between 2000 and 2003, at age 64 or younger, and with a date of diagnosis at least 14 days prior to death. With the information from the Swedish National Cause of Death Register, the Multi-generation Register at Statistics Sweden linked deceased individuals with bereaved children. For a child to be eligible he or she had to have been between age 13 and 16 at the time of loss, been registered at the same street address as both parents at the time of loss (i.e. the parents had not been divorced or separated), and have a living parent at the time of follow-up. Statistics Sweden provided a random selection of non-bereaved peers whose parents were non-divorced, and matched for age, sex/gender and place of residency to the bereaved in the proportion of 1 non-bereaved to 2 cancer-bereaved. As final inclusion criteria, all participants had to be able to understand, read and write Swedish, reside in Sweden during data collection, and have an identifiable telephone number. Of 1589 youth assessed, 1272 were confirmed eligible (Figure 2).



- 1) Potentially eligible participants provided by registers
- 2) No telephone number could be identified or identified number was inactive
- 3) Parents divorced (n=8), both parents deceased (n=5), parental cause of death was not cancer (n=2), participant born outside the Nordic countries (n=9), time of cancer diagnosis shorter than 14 days (n=4), mental impairment or disability, according to caretaker (n=6), emigrated, permanently living or staying abroad for the whole data collection period (n=30)
- 4) After the completion of the data collection the Multi-generational register provided information on the group-level about number of cancer-bereaved and non-bereaved, respectively, among those with whom we had not been able to establish contact.

Figure 2. Flowchart for inclusion

4.3.2 Data collection

Data collection started in February 2009 as we started to successively send introductory letters to identified youths. The letter included information about the study and its aims, the right of the individual to refrain from participation, and how to

contact the researchers. Each individual was then subsequently called by one of the two research assistants that were employed for this purpose. During the phone-call participants were asked if they wanted to participate and if so, if they had been bereaved of a parent or not. An anonymous questionnaire was sent only to those who consented to participate. Enclosed with the questionnaire were an ethics information sheet and a reply card with a separate envelope to ensure anonymity. After around two weeks a combined thank-you and reminder card was sent. To those whose reply cards weren't received, the research assistant made reminder phone-calls. The data collection procedures of our research group have been described in more detail by Omerov and coworkers¹⁰⁰. Data collection was ended in March 2010.

4.3.3 Data management

Data from questionnaires were manually entered into the free-ware data entry software EpiData, version 3.1 (EpiData Association, Odense, Denmark). EpiData had been programmed to only accept appropriate values for every question to minimize the risk of entering erroneous data. Ambiguities, such as double-marks, in-between marks and ambiguities in written answers to open-ended questions were registered in a separate list to make them traceable. This list was then gone through for each variable and ambiguities were solved for example with the method of alternating between entering the lowest value and the highest value given, respectively. The values in a random sample of 20 questionnaires were re-entered and compared to test the reliability of the data that had been entered.

For statistical analyses we used the statistical programs SPSS (Statistical Packages for the Social Sciences), SAS, version 9.3 (Statistical Analysis System, SAS Institute Inc., Cary, NC, USA), and R, version 2.13.2 (R Foundation for Statistical Computing, Vienna, Austria) using the *mice* and *BMA* packages.

4.3.4 Ethical considerations

There are a number of ethical principles that should be considered in research that involves human subjects in order to protect them from harm. Our research involves asking questions that might cause distress through reminding of painful feelings and experiences (reopening of old wounds). This potential harm should be balanced against the possible benefits of the research in terms of increased knowledge that might improve the situation of future teenage children whose parent is seriously ill and dies. Central ethical principles are the questions about autonomy, informed consent, confidentiality and respect for integrity. Our participants received written and oral information in several steps, in the introductory letter, in the telephone call and in an ethics informational sheet that was included in the questionnaire. Information included the study aims, potential harms and benefits of participation, and the right to refrain from participation at any time point (ie, even after initial consent) without consequences. All participants were aged 18 or older and were thus capable of making their own decisions about participation without the need for a legally authorized representative and the relationship between participants and

researchers was non-dependent (with no risk of reprisal). The questionnaires were anonymous.

In a research project like this, harm might be inflicted in two situations: from the contact attempts with the introductory letter and the telephone call and from completing the questionnaire. We have no indications of having caused anyone harm by attempting contact. We refrained from data collection during family holidays and the anniversary of parental loss. For this reason we had asked the Multi-generation register to provide us with information about the month when we should not attempt making contact. Non-bereaved were randomly supplied with numbers 1 to 12 (i.e., from January to December). In this way the Register avoided to reveal who was bereaved and non-bereaved, respectively. According to Swedish law, all research involving human subject must have the research ethics vetted (SFS 2003:460). Our project was considered by the Regional Ethical Review Board of Karolinska Institutet, Stockholm, Sweden (2007/836-31).

5 RESULTS AND COMMENTS

5.1 PARTICIPATION RATE AND CHARACTERISTICS OF THE POPULATION

Among 851 eligible cancer-bereaved youth, 622 (73%) returned the questionnaire. Reasons for non-participation were 13% for failure to return the questionnaire despite initial agreement to participate, 8% for declined participation, and 6% for those who we were not able to establish contact with. Three-hundred and twelve of the participants were female (50.2%) and 48.6% were the youngest sibling. At the time of follow-up, 88.3% of the cancer-bereaved youth were either studying at university, employed, or self-employed. Characteristics of the cancer-bereaved youth are detailed in Table 1 of each paper. According to the bereaved youths, the most common diagnoses were gastrointestinal cancers (21%), breast cancers (16%), brain tumors (11%) and lung cancers (11%). Ten percent did not know or remember where the cancer originated (Table 1).

Table 1. Cancer-bereaved youth report of parental cancer site

Cancer site	N=613	%
• Gastrointestinal	128	21
• Breast	100	16
• Gynaecological	17	3
• Prostate	13	2
• Urinary tract	16	3
• Skin	29	5
• Sarcoma	14	2
• Haematological	39	6
• CNS	67	11
• Lung	67	11
• Head-neck	17	3
• Thyroid	1	0
• Unknown primary	12	2
• Don't know, don't remember	59	10

Among non-bereaved youths, 330 out of 421 (78%) answered the questionnaire. In this group 9% never returned the questionnaire, 7% declined participation already at the first contact and for 6% we could never establish contact. Details for the non-bereaved group appear only in Paper 1, Table 1, since in this thesis this is the only article in which the non-bereaved group appears. One-hundred and sixty-one (48.8%) were females. At the time of follow-up, 90.0% of the non-bereaved youth were studying at university level, employed, or self-employed. Non-bereaved youths were matched to the cancer-bereaved youths for sex/gender, age and place of residence. However, the groups turned out to be significantly different on the variables of maternal and paternal age ($p < .001$) with the non-bereaved group being children of younger parents than the cancer-bereaved group. Possibly, this difference is

accountable because the risk of cancer increases with age and therefore cancer-bereaved families would be older than the average non-bereaved teenage family.

5.2 PAPER I. SELF-INJURY IN CANCER-BEREAVED AND NON-BEREAVED YOUTH

5.2.1 Paper I. Results

Among 622 cancer-bereaved youth, 616 had responded to the question of self-injury whereof 19.5% reported to have self-injured after, or both before and after January 1st, 2000. The corresponding figure among 329 non-bereaved youth was 10.6% yielding a statistically significant RR of 1.8.

To the question asking if participants had tried to commit suicide after January 1st, 2000, 6.2% of cancer-bereaved and 4.0% of non-bereaved responded yes. The difference was not statistically significant. Thirty percent of cancer-bereaved self-injurers also reported a suicide attempt, while only 0.4% in non-self-injurers reported having attempted suicide.

Nineteen background, childhood adversity and social relations variables were considered both for potential effect-modification and prediction of self-injury. No statistically significant interactions were found. Exploratory variable selection with forward selection procedure identified five variables as predictive and thus potentially confounding factors for self-injury; being female; experience of childhood bullying; physical or sexual assault; poor family cohesion; and not having had anyone with whom to share joys and sorrows. The unadjusted OR of self-injury in cancer-bereaved group was 2.0 (95%CI 1.4 to 3.0). In the final logistic regression model including these five variables the adjusted OR was 2.3 (95% CI, 1.4 to 3.7).

Out of 11 variables measuring symptoms of mental distress at time of follow-up and considered as possible mediating factors, two showed statistically significant associations with self-injury: emotional numbness and having been diagnosed with depression after January 1st, 2000.

5.2.2 Paper I. Comments

We found that self-injury was twice as common in parentally cancer-bereaved as in non-bereaved youth. To the best of our knowledge the relationship between parental death from cancer and subsequent self-reported self-injury in bereaved children has never been studied before. In previous studies of self-reported self-injury (i.e. non-register, non-patient studies), parental death could not be distinguished from categories broadly labeled as “not living with both parents”, or “death of someone close”^{29,33,41,101-103}. The only study we could identify that specifically addressed parental death, a study of 133 American psychology students, was underpowered to allow exploring the association of parental bereavement and self-injury¹⁰⁴. Two register-studies based on Swedish and Danish data indirectly support our association

between parental cancer-death and self-injury^{27,28}. Both studies focus on offspring suicide attempts as registered by the health-care system, i.e. a more serious outcome than self-reported self-injury. Both studies documented offspring suicide attempts to be statistically significant associated with a parent's natural cause of death²⁷ and non-suicide death²⁸, respectively. However, in our population we did not find a statistically significant risk for suicide attempts that were self-reported. The most often cited reasons to self-injure are to regulate overwhelming feelings and to stop dissociation^{36,37,105}. Depression and anxiety are known risk-factor for self-injury^{33,41,45} and possible bereavement outcome^{23,25}. We found depression reported to have occurred after January 1, 2000 and emotional numbness to be potentially mediating factors for self-injury. The mechanism could be that bereavement causes overwhelming feelings, depression, numbness and dissociation which spark self-injurious behavior in affected youth.

5.3 PAPER II. COMMUNICATION AND TRUST IN THE CARE PROVIDED TO A DYING PARENT

5.3.1 Paper II. Results

In this article we first examined the level of trust in the care provided to the parent in his or her final week of life and found that 488 (82%) reported moderate or very much trust. In this group, 11% had a score of 10 or more on the PHQ-9 (Patient Health Questionnaire) at time of follow-up six to nine years after the loss, indicative of moderate to severe depression. In comparison, in youths reporting no or little trust (distrust) in the health-care provided, 25% had PHQ-9¹⁰⁶ scores above 10, yielding an RR of 2.3 (95%CI 1.5 to 3.5) for depression in those who reported distrust.

Next, we investigated the potential association between on the one hand if, and at what point in time relative the loss, end-of-life medical information was given and on the other hand the children's level of trust. End-of-life medical information was denoted as "Information about the disease, its treatment and the imminent death given by a physician". We found that compared with those who were given end-of-life medical information before the loss, the risk of distrust was statistically significant higher in those who received end-of-life information only after the loss (RR, 3.2, OR, 4.5), those who never received information (RR, 2.5, OR, 3.2), and among those who did not know or remember if end-of-life information had been provided (RR, 1.7).

Finally, we used two different automated variable selection methods, Forward selection and BMA among 27 variables considered as potential risk-factors and confounders. We found very strong associations between distrust and two predictors; the teenage child's perception of that health-care had made poor efforts to cure the parent (Forward selection, $P < .001$; BMA, 100%) and a poor relationship with the surviving parent during childhood (Forward selection, $P = .0096$; BMA, 99.9%).

Adjustment with these two variables one at a time lowered the OR for self-injury between 6% and 12%. The additional adjustments with additional and less strongly

associated variables identified by Forward selection further lowered the OR values but ORs for self-injury remained statistically significant for no end-of-life information and end-of-life information only afterwards.

5.3.2 Paper II. Comments

To our knowledge this is the first study of teenage family members' trust in the health-care provided to a parent dying from cancer, and on the consequences of distrust and how trust is affected by end-of-life information provided by a physician. Smets and coworkers found high levels of trust in the treating physicians among cancer patients, regardless of communication quality aspects as rated by the researchers⁷⁶. However, in this study all patients and physicians were communicating and authors suggest that patients need and determination to trust the physicians might explain the high levels of trust⁷⁵. Our finding of high levels of trust among teenagers might indicate a corresponding need to trust in family members or that level of trust in teenage family members mirrors the trust of their dying parents.

In our study, trust was associated with if and when an end-of-life family meeting with the physician had taken place. Results from a Canadian study of 160 adult family members that satisfaction with end-of-life care was higher in those who had been given prognostic information by a physician, support our finding of the positive effect of providing information before the loss⁸⁰.

How can we understand the influence on the evaluation of trust that results from meeting the physician and being given end-of-life information? Several explanations or mechanisms are plausible including stress reduction from informational support; meeting the physician counteracting feelings of avoidance or abandonment at the end of life and by showing an ability to prognosticate, the physician is perceived as knowledgeable and for that reason also trustworthy. It is possible that lack of forewarning that death is imminent increases the shock and anger that are seen as part of the reaction to loss and crises^{49,107,108}.

We found that children's perception that health-care professionals' efforts to cure their parents' disease were poor as well as a poor relation with the surviving parent were significantly associated with distrust. It seems highly reasonable to react with distrust to poor health-care efforts in the very serious situation when a loved one is dying. Therefore, it is probably wise to explore and improve family members' understanding of the disease, interventions and termination of treatments¹⁰⁹⁻¹¹².

Finally, we found an association between distrust in the health-care that was provided and depression 6 to 9 years after the loss. This finding is supported by Brent and coworkers who showed that two years after the loss children who perceived others to be accountable for their parent's death had an increased risk for depression²⁵. The mechanism could possibly be explained by guilt arising if family members had perceived the health-care provided to have been inadequate but did nothing to try to influence the providers^{50,113,114}. However, we need to take into account that

depression at follow-up (i.e. when responding to the questionnaire) might contribute to feelings of distrust as well.

5.4 PAPER III. FAMILY-RELATED AND HEALTH-CARE RELATED RISK-FACTORS FOR SELF-INJURY

5.4.1 Paper III. Results

In this paper, we focused on the association between self-injury and family and health-care related variables that the health-care professionals caring for the dying parent potentially could have an impact on.

Among the family-related factors, in univariable analysis, we found poor family cohesion before (RR, 3.4) as well as after (RR, 3.3) the loss to be statistically significant associated with self-injury. Among health-care related factors, distrust in the health-care provided in the dying parents final week of life (RR, 1.7), a perception that health-care efforts to cure had been poor (RR, 1.5), and a perception that health-care efforts to prevent suffering had been poor (RR, 1.6), were found to be associated with self-injury.

After adjusting for previously well-documented risk-factors for self-injury (depression, being female and having been subjected to bullying or abuse/assault) poor family cohesion before and after the loss and distrust in health-care were still associated with self-injury. Automated variable selection procedures within family and health-care related variables first and foremost identified family cohesion before and after the loss, but also 1) parental mental distress or work-life problems, 2) youth worrying on behalf of surviving parent, 3) distrust in health-care, 4) recurrence of disease, and if 5) the teenage child had not talked with the dying parent about that which they felt to be important, to be associated with self-injury. After additionally adjusting for automatically selected variables, only poor family cohesion before and after the loss remained statistically significant associated with self-injury. Distrust, perceived poor efforts to cure and to relieve suffering were associated with self-injury, history of abuse, depressions, and poor family cohesion.

5.4.2 Paper III. Comments

Among family-related variables, poor family cohesion before and poor family cohesion after the loss were strongly associated with self-injury, a finding supported by previous research in non-bereaved samples^{115,116}. Again, the mechanism might be that poor family cohesion is an indication of poor communication within the family. Again, the mechanism might be that poor family cohesion is an indication of poor communication within the family. This might limit the teenagers' access to the knowledge and the vocabulary needed to understand and process the trauma of losing a parent to cancer, leading to thought suppression, alexithymia (i.e. being without words for feelings¹¹⁷), and overwhelming feelings and emotional numbness which are common reasons for self-injury^{36,37,105}.

It is perhaps not surprising that perceiving that the health-care provided to the dying parent was inadequate can be highly distressing. Still, the association between perceived inadequate health-care and self-injury was fairly weak and the effect was attenuated by teenagers' history of being subjected to abuse and assault, depression and poor family cohesion.

5.5 PAPER IV. OPINIONS AND EXPERIENCES OF BEING TOLD ABOUT IMMINENT LOSS

5.5.1 Paper IV. Results

In paper IV which is a descriptive study, we explored the opinions, experiences and barriers to being told when parental loss was imminent (ie. a matter of hours or days not weeks) and the points in time when the teenagers realized that the parent had cancer, that the disease was incurable, and that the parent would die from the disease.

We found that 98% of participants thought that teenagers about to lose a parent to cancer should be told when death was imminent. Six out of 10 reported having been told. Among them, 62% had been told by parents, 11% by parents together with health-care professionals and 14% by health-care professionals alone. The most frequently cited reasons for lack of talking about imminent death with the parents were mutual pretending and lack of awareness that death in fact was imminent. Twelve percent of teenagers had not talked with the dying parent, 10% not with the surviving parent and 4% with neither because of mutual pretending. The corresponding figures for that there was no talking because neither the teenager nor parents understood the gravity of the situation, was 17% with the dying parents, 19% with the surviving parents, and 14% of teenagers had not talked with any of the parents since neither parents nor children had realized death was imminent. Forty-four percent of participants realized that death was imminent on the final day, half of them in the last couple of hours and an additional 19% reported that they had not understood that death was imminent until afterwards.

5.5.2 Paper IV. Comments

Almost all participants believe they should have been told when parental loss was imminent but many were not told and realized what was happening only hours in advance and some not even then. Mutual pretending and lack of awareness accounted for several of the failed conversations within the family. To our knowledge this is the first nation-wide survey documenting opinions and experiences of being given information about the imminent death of a parent in cancer-bereaved youth. Our findings provide additional support for interventions aimed at open and honest family communication^{86,94,118}. The reasons why teenagers want to know when death is imminent are probably almost self-evident: to be given the chance to say goodbye¹⁸, to deal with any unfinished business, to stay close and to prepare mentally for the loss. In addition, health-care professionals' ability to predict imminent death can be speculated to be perceived as evidence that they are knowledgeable, skillful and

trustworthy. Likewise, important and perhaps sometimes overlooked benefits from talking with teenagers, even about distressing issues, are that the conversations themselves provide the teenagers with the words needed to understand and process the trauma, and help them to be comforted by knowing that the truth was not withheld and that it was possible to talk about the topic then, now, and in the future ¹¹⁹.

In total, 44% had been told about imminent death by a parent, which is in accordance with the finding by Kricbergs and coworkers of family communication in terminally ill children older than nine years ⁵¹. We are unaware of any other study reporting prevalence of different reasons for failed conversations in families with children or teenagers. In adult family members pretending has been reported to be between 4% and 15% ¹²⁰. Apparently, not all couples mutually agree on how to behave. For example in a Scottish study of surviving parents only two out of nine reported that they and their dying spouse had agreed to tell their children that one parent was dying. The remaining couples had agreed not to talk with the children or disagreed with each other ⁹¹. According to teenagers' belief, in the last day of the parent's life 9% of physicians were still not aware that death was imminent. We lack the corresponding information from physicians and can only conclude that this might explain half of the parental unawareness of 17-19% as indicated by their teenage children.

6 METHODOLOGICAL CONSIDERATIONS

The perfect study only exists in theory. Two types of errors affect all studies to a varying degree: random errors (chance) and systematic errors (bias)^{121,122}. Random errors such as those resulting from fluctuations in readings of an instrument, lead to readings that are scattered around the true value and can hypothetically be reduced to zero if the study size were to be infinite¹²¹. Systematic errors make the estimate (effect measure, association) deviate systematically from the true value, thus lowering the validity of the study since these errors color the interpretations that are made. The circumstances that can lead to systematic errors include confounding, misrepresentation (selection bias), and misclassification (information bias).

Attempting to minimize the influence of systematic errors, the research group of Clinical Cancer Epidemiology employs epidemiological methods adapted to the field by the hierarchical step-model for causation of bias¹²². The model is presented in Figure 3.

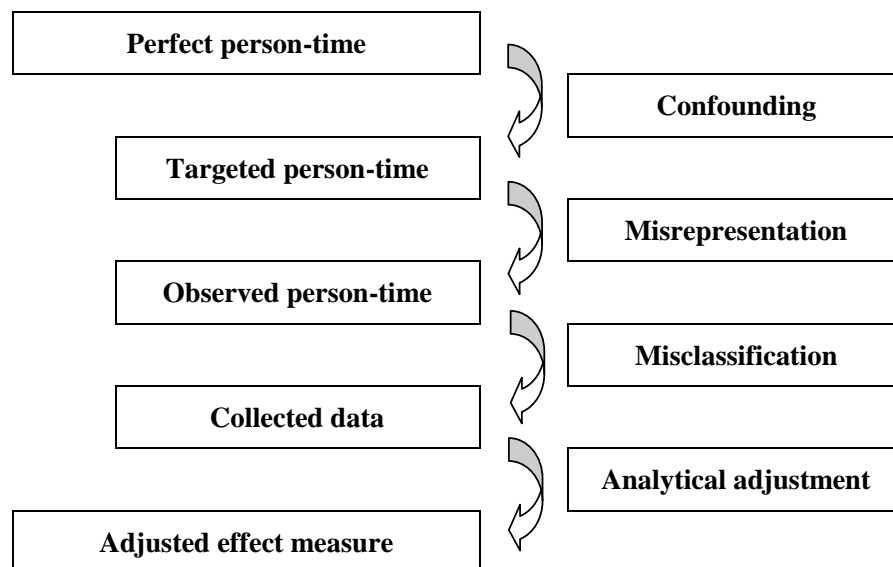


Figure 3. Steinecks' hierarchical step-model for causation of bias¹²²

6.1.1 Confounding

Confounding is bias that is introduced by a third variable that is associated both with the exposure and the outcome variable. The problem arises if there is an imbalance or uneven distribution of confounders between groups. In general, randomization, matching and restriction are methodological means to control confounders already in the design of the study. In our project, we matched the non-bereaved to the bereaved on the variables sex/gender, age and place of residence (see paper I). In observational studies the important means to gain control over confounders is to measure them since this enables later statistical adjustments. The variables sex/gender, age and level

of education (or socio economic status) are probably the most often measured potential confounders in nursing, medical and behavioral research.

In paper I, for the outcome of self-injury we included 17 more or less well documented potential confounders that could be measured in both bereaved and non-bereaved (e.g. birth order, bullying or abuse, other losses, psychological morbidity, and family cohesion). In paper II, we studied the teenage children's level of trust in the health-care that was provided to the dying parent. The knowledge about risk-factors and potential confounding between end-of-life medical information and trust in teenage children whose parents were dying from cancer was limited. We explored the association between 27 potential predictor variables and trust in health care. In paper III we were focused our study on the possible influence of family-related and health-care related factors on self-injury, we found seven such factors (i.e. exposure variables) to be associated with self-injury. We thus had seven different associations to consider for confounding.

6.1.2 Misrepresentation

Misrepresentation refers to the potential problem if the relation between exposure and outcome differs between the sample that was initially intended to be included (targeted person-time) and those that actually participated (observed person-time). We have no information about the associations being different among non-participants and thus if or how results would have changed if they had participated. To address this problem, we employ data collection routines to increase participation rates as much as possible. Probably, the careful preparation of the questionnaires (including relevant questions, adequate response options, trying to find a balance between relevancy and length so as not making participation too time consuming) and the routines for data collection (clear information, personal and timely telephone contact, avoiding initiating contact on anniversaries, family holidays, vacations) increase participation rate. For ethical reasons we did not actively ask for the reasons why an individual decided to refrain from participation.

6.1.3 Misclassification

Misclassification refers to erroneous classification of a person, either on the exposure variable (eg, a participants of a family with good cohesion is for some reason classified as having had poor family cohesion) or the outcome variable (a participant is classified as a self-injurer but is fact not). Misclassification could stem from the test (ie, the questionnaire) having less than 100% perfect sensitivity (ability to correctly identify true positives) and sensitivity (ability to correctly identify/reject true negatives). The study-specific questions and response-options in our questionnaires originated in the preparatory interviews and were tested for face-to-face validity with cancer-bereaved and non-bereaved youths.

For papers I and III, the formulation of the outcome question regarding self-injury was inspired by and closely resembled the questions used in previous international research into the subject. For example, the multicenter study CASE^{34,35,115} used the question “*Have you ever deliberately taken an overdose (e.g. pills or other medication) or tried to harm yourself in some other way (such as cut your-self)?*” (the broader concept of self-harm in the CASE study meant overdosing included to self-injury). The Deliberate Self-Harm Inventory (DSHI, ref Sverige, Italien, USA) phrases the question in the following way: “*Have you deliberately engaged in _____ [9 possible self-harming behaviors] the past 6 months?*”¹⁰⁴ The Self-Harm Inventory, SHI, asks “*Have you ever on purpose, or intentionally _____ [41 items regarding e.g. overdosed, banged head, driven recklessly, engaged in physically abusive relationships]?*”¹²³.

To make it possible to pose the identical question to non-bereaved who had no loss to related to, we asked about self-injury before, after, or both before and after January 1st, 2000. Before this date none of the cancer-bereaved had lost a parent. We used the identical question and response-options for cancer-bereaved as for non-bereaved (paper I), with a follow-up question in cancer-bereaved only to ascertain the timing of self-injury relative the loss of a parent (paper III). In paper I, the exposure variable was bereavement status. For confidentiality reasons, national registers did not give us the information about who was cancer-bereaved and non-bereaved. However, we had asked the registers to provide us with participants in a proportion of 2:1. To ascertain bereavement status we asked participants if they were bereaved or not during the contact phone-call. Which one of the two questionnaires the participants were send depended on their answer. Both questionnaires also started by asking if it was true that the participant was bereaved or non-bereaved, respectively. The final proportion of eligible cancer-bereaved was 851 out of 1272 (66.9%), and participating cancer-bereaved was 622 of 952 (65.3%) indicating that misclassification on this variable was limited. The use of anonymous and self-administered questionnaires reduces the risk of interviewer bias, i.e., the influence of the researcher on the participants’ answers. We have no knowledge about if measures are influenced by recall bias, the tendency in those who have the outcome in consideration to overestimate certain exposures.

6.1.4 Analytical adjustments

The effect measures of papers I, II and III are adjusted for potential confounders. Automated variable selection methods such as Forward selection and BMA were used to attempt to avoid choosing redundant variables as predictors of outcomes. In papers I, II and III, outcome variables are dichotomized and data presented as RRs or ORs, with 95% CIs allowing interpretation of the precision of our measures. Paper IV is descriptive.

In paper 1 we had information about around 30 potential confounders which were considered as possible predictors/risk-factors for self-injury and then included in

forward selection procedure and adjusted for in multivariable modeling. Since the effect measure was similar, possibly somewhat higher, after adjustments, we concluded that none of the potential confounders we had considered could explain our main finding. In paper II we included information about 27 potential predictor variables and confounders in the analyses and used two different automated variable selection methods. The reason we did so was to identify potential confounders that were strongly associated with the outcome (trust) to use in adjustments in order to question our main finding. Our multivariable modeling reduced the ORs for trust for no end-of-life information and end-of-life information only afterwards, respectively but associations were still statistically significant. In paper III we considered 32 variables as potential risk-factors and confounders. First, we adjusted our seven effect measures successively for previously well-documented risk-factors for self-injury such as sex/gender, bullying, assault and depression. This reduced the ORs for self-injury but ORs remained statistically significant for poor family cohesion before and after the loss, and distrust, respectively. Automated variable selection with Forward selection and BMA among family- and health-care related factors only, identified an additional seven risk-factors and potential confounders. After including these into the adjustments only the family cohesion variables remained statistically significant associated with self-injury.

In none of papers I, II and III can we exclude the possible influence of unknown and unmeasured variables on the effect measures.

7 CONCLUSIONS

Our research method and results provide important additional pieces of scientific knowledge about the perceptions held by cancer-bereaved youths about health-care and family-related variables and their potential impact on long-term mental distress that completes the picture created from previous qualitative as well as quantitative studies.

We found that the loss of a parent to cancer during teenage years is associated with potentially serious mental distress that might be unrecognized by the adult world. We also identified risk-factors i.e. predictors of mental distress that are additional and possibly modifiable.

Specifically, we conclude that:

The prevalence of self-injury was twice as high in cancer-bereaved compared to non-bereaved youths. Several of the previously documented risk-factors for self-injury were also identified as risk-factors in our participants. However, they could not explain the association between parental cancer-bereavement and self-injury.

The risk of self-injury was highest in bereaved youth who reported poor family cohesion. Perceived suboptimal health-care, in terms of distrust in the care provided, perceived poor efforts to cure and relieve suffering, were associated with self-injury as well as a history of assault, depression and poor family cohesion. Hence, the associations between these health-care related variables and self-injury were attenuated when all risk-factors were accounted for.

The majority of cancer-bereaved youths reported moderate to very much trust in the care that was provided to the dying parent. Distrust in care provided was more prevalent among those who did not receive end-of-life information by a physician *before* the loss, i.e. among those who were not given end-of-life information and those only informed afterwards. The risk of distrust was high among cancer-bereaved youth who perceived health-care efforts to cure the parents as poor, and in those who had a poor relationship with the surviving parent. Distrust was associated with depression six to nine years after the loss.

Almost all cancer-bereaved youth believe that teenagers should be told when a parent's death from cancer is imminent. Most often it is the parents that tell their teenagers about the imminent loss. A third of teenagers did not receive the message that death was imminent, most often family communication failed because of child-parent mutual pretending and not realizing that the time left was short. 44% of cancer-bereaved youth realized death was imminent the last day and 23% realized it only hours before it happened. An additional 19% did not know until after the loss.

8 IMPLICATIONS AND FUTURE RESEARCH

The implications from the results of the studies here included are that:

Increased awareness of the risk of self-injury in cancer-bereaved youth - in the health-care professionals that care for the parents, in general practitioners, in school health-care and in society at large - could enable early detection and provision of support for a group of youths who are severely distressed.

Possibly, by increasing teenagers understanding of disease, health-care (including treatment decisions), and the emotional impact, and by encouraging family communication family cohesion can be improved and more realistic perception of health-care efforts achieved, potentially counteracting self-injurious behavior and distrust in health-care.

There are several ways in which health-care professionals can increase the number of teenagers that are given support and information about a parent's imminent death from cancer. In the situation when a person who is a parent of dependent children faces his or her own premature death and the spouse of this person faces bereavement and becoming a single parent, far from all adults are capable of talking with their children about what is happening. Supporting the family members in helping them establish open and honest communication based on increased understanding has an obvious potential to benefit the teenagers both in the highly stressful period before the loss, after the loss and in the years to come as new questions and grief reactions might surface.

However, in most cases only the health-care professionals have the experience and knowledge needed to realize when death is approaching. It is thus the responsibility of professionals to initiate the end-of-life dialogue to support families understanding of the situation.

As for future research, there are several highly relevant issues that might be investigated. For example;

- What were the duration and the timing of self-injury relative to the loss and what support was received?
- What kinds of advices to the health-care professionals would the participating cancer-bereaved youth want to give?
- What kinds of support where the participating cancer-bereaved teenagers offered by school health-care? Did they accept it?
- What kinds of health-care mistakes perceived by the teenagers and are there different consequences depending on the type of mistake?

- What is the extent of, the predictors and consequences of dammed-up (i.e. delayed) grief in cancer-bereaved youth?
- Are there any consequences of distrust on physical and psychological morbidity, other than depression?
- How was study participation perceived by cancer-bereaved youth?

Further study:

- What would be the impact of a family focused intervention on understanding the disease and its treatment, on family cohesion, self-injurious behavior, and distrust and depression?
- What is the impact and experiences of parental cancer-bereavement in children living with single-parents, on newly arrived immigrant children and or younger children, e.g. aged 10-12?
- Could distrust in provided health-care be used in screening for distress?

9 SVENSK SAMMANFATTNING

Bakgrund: Målet med studierna som ingår i denna avhandling var att öka kunskapen om erfarenheter och riskfaktorer för psykisk ohälsa hos personer som miste en förälder i cancer under sina tonår. Vi har särskilt intresserat oss för riskfaktorer, vid sidan om själva förlusten, som skulle kunna påverkas av sjukvården.

Metod och deltagare: Vi tog fram en studiespecifik enkät baserad på semi-strukturerade intervjuer och tidigare forskning. Med hjälp av populationsregister identifierades barn som i åldern 13 till 16 år hade mist en förälder i cancer mellan år 2000 och 2003. För att inkluderas skulle barnen levt med sammanboende föräldrar, ha fötts i ett nordiskt land och ha ett identifierbart telefonnummer. Av 851 ungdomar svarade 622 (73%) på enkäten. Populationsregistren bidrog också med en grupp matchade (ålder, kön, bostadsort) icke förlustdrabbade personer varav 330 av 421 (78%) svarade på en nedkortad men i övrigt identisk enkät. Datainsamling skedde i huvudsak under år 2009. Vid studiens genomförande var deltagarna mellan 18 och 25 och det hade gått sex till nio år sedan förlusten.

Resultat: Tjugo procent av de förlustdrabbade rapporterade att de haft en period då de medvetet hade skadat sig själva genom att skära eller bränna sig, jämfört med 11% bland icke förlustdrabbade. Justering för kön, självskadebeteende, mobbing, fysiska eller sexuella övergrepp och att inte ha haft någon att dela glädje och sorg med i barndomen ökade oddskvoterna från 2.0 till 2.3. Av undersökta familje- och vårdrelaterade möjligen påverkbara faktorer fann vi ett samband med självskadebeteende för följande: Dålig familjesammanhållning före förlusten (relative risk [RR], 3.4), dålig familjesammanhållning efter förlusten (RR, 3.5), misstro mot sjukvården som föräldern fått den sista veckan i livet (RR, 1.7), upplevelsen att sjukvården inte gjort allt för att lindra lidande (RR, 1.6), och upplevelsen att sjukvården inte gjort allt för att bota sjukdomen (RR, 1.5). Sambanden mellan dålig familjesammanhållning och självskada minskade men fortsatte vara statistisk signifikant efter justeringar med flera variabler (kön, fysiska eller sexuella övergrepp, depression). Sambanden med de vårdrelaterade faktorerna späddes ut i multivariabla modeller.

Åttiofem procent av deltagarna uppgav måttlig till mycket tillit till den sjukvård som föräldern fått sin sista vecka i livet. I denna grupp hade 11% måttlig till svår depression jämfört med 25% bland dem som uppgav sig ha haft ingen eller liten tillit (misstro) till vården, RR=2.3. Risken för misstro var högst bland dem som inte hade fått information om sjukdom, behandling och dödsfall av en läkare (RR, 2.5) eller dem som bara fått information efter dödsfallet (RR, 3.2). Andra viktiga riskfaktorer för misstro till den sjukvård som föräldern fått sin sista vecka i livet var upplevelsen att sjukvården inte hade gjort allt för att bota sjukdomen och en dålig relation med den överlevande föräldern. Nittioåtta procent av deltagarna tyckte att tonåringar bör få veta när en förälders dödsfall är nära förestående (en fråga om timmar eller dagar, inte veckor). Bland 367 (60%) som hade fått veta att dödsfallet var nära förestående hade 62% fått veta detta av sina föräldrar, 11% av föräldrar tillsammans med

sjukvårdens professionella and 14% av professionella enbart. Att föräldrar och barn tillsammans hade låtsats eller inte hade förstått att dödsfallet var nära förestående var vanliga anledningar till att samtal i familjen hade uteblivit. Fyrtiofyra procent av tonåringarna hade förstått att förlusten var nära förestående under sista dagen, hälften av dem när det bara var timmar kvar. Ytterligare 19% förstod inte detta förrän efteråt.

Slutsatser: Självskada är dubbelt så vanlig bland ungdomar som mist en förälder i cancer. Dålig familjesammanhållning före och efter förlusten är viktiga riskfaktorer för självskadebeteende. Betydelsen av att ha uppfattat föräldrarnas sjukvård som dålig varierade med familjesammanhållning, andra svårigheter i livet och depression. En femtedel av ungdomarna uppgav att de inte hade litat på att föräldern fått god sjukvård sin sista vecka i livet. Information om sjukdom, behandling och dödsfall av en läkare före dödsfallet sänkte misstron mot vården. Nästan alla ungdomar ansåg att tonåringar ska få veta när föräldrarnas död är nära förestående (en fråga om timmar eller dagar, inte veckor) men många hade inte fått detta besked.

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