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REVIEW ARTICLE

Morbidity, mortality, and parental grief: A review of the literature on the relationship between the death of a child and the subsequent health of parents

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ABSTRACT

Objective: This review was undertaken to analyze the research to date and identify areas for future research regarding the associations between parental grief after the death of a child and the subsequent health of the parents, including both their mortality and morbidity risks.

Methods: Relevant literature was identified through a search of OVID-Medline, CINAHL, and PsycINFO using variations of the terms "parental grief and bereaved parents" combined with "health," "illness," "morbidity," and "mortality." Additionally, bibliographies of selected articles were reviewed to identify additional sources. The final sample includes 17 articles.

Results: The literature search revealed a paucity of publications on the topic. However, it also showed that the studies that have been done examining the relationship between parental grief and health outcomes have produced conflicting results in almost every disease state examined. Additionally, several concerns with the quality of existing studies came to light that may bring their results into question. Three primary areas of concern surfaced including lack of consistency in measurement for psychological variables and "soft" self-report health outcomes, questionable methodologies in bereavement research in general, and the lack of a uniform definition of bereaved parents.

Significance of results: Based on these findings, it is clear that more methodologically sound research is necessary to clarify the relationship between parental grief after the death of a child and the parents' subsequent morbidity and mortality risks.

KEYWORDS: Bereaved parents, Parental grief, Health outcomes, Child death

INTRODUCTION

Traditional Understanding of Bereavement and Health

Much of the literature on health outcomes in the bereaved focuses on the approximately 800,000 older people who lose a spouse each year, and suggests that in the months following the loss of a spouse, widows and widowers are at higher risk for depression (Ott et al., 2007), PTSD (Zisook et al., 1998), impaired immune response (Phillips et al., 2006), increased use of health care services (Prigerson et al., 2000; Charlton et al., 2001) increased health care costs (Prigerson et al., 2000), sudden death (Ott et al., 2007), and death from all causes (Hart et al., 2007) than are members of the general population (Clayton, 1973; Jacobs & Ostfeld, 1977; Zisook et al., 1998; Prigerson et al., 2000; Ott et al., 2007) Many studies have also been completed describing the grief experience of other adults such as caregivers, children, parents, siblings, and friends; however, very few identify health outcomes in the bereaved that may not be detected until months or years after a significant loss. Those studies that have been completed suggest that the nature of the bereaved adult's

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relationship with, involvement in the care of, and cause of death of the deceased individual significantly affect his or her risk for adverse mental and physical health outcomes (Prigerson et al., 1997; Schulz et al., 2001; Brazil et al., 2002). Those with close relationships to the deceased, a high level of involvement in care, and who experience a loss to a sudden or violent death tend to exhibit more adverse outcomes, whereas those with distant relationships, no or little involvement in caregiving, and who experience a loss from a chronic condition or expected circumstance tend to follow the expected grief trajectory more closely.

Though studies report wide variation in the adjustment of bereaved adults as manifested psychological symptoms (including depression and PTSD) and the duration of the grief response (Charlton et al., 2001; Ott et al., 2007), for most adults the typical grief course occurs in stages, as described by Kubler Ross (1969), and results in lower grief scores and higher levels of adjustment over time (Zisook et al., 1998; Ott et al., 2007). In his book *Bereavement: Studies of Grief in Adult Life*, Colin Murray Parkes (1998) named this time of adjustment "psychosocial transition." He described the variable concept of bereavement as an adaptation to a different life while cherishing the memory of the person who has died—rather than a process with a defined beginning and ending (Parkes, 1998).

Although the grief course and subsequent health risks appear to be well defined for adults experiencing expected losses such as an aged spouse or parent, it remains unclear whether the experience and subsequent health risks are similar for those experiencing the loss of a child. This review will provide an analysis of the literature surrounding health outcomes in bereaved parents.

Bereaved Parents

Children, who make up about 29% of the United States' population, account for 2% of all the deaths annually (Institute of Medicine, 2004). The most recent publication of *National Vital Statistics* indicates that approximately 56,000 of them die each year (Hoyert et al., 2005). This figure includes neonates, infants, children, and adolescents who die from a wide range of conditions such as premature birth, SIDS, congenital abnormalities, trauma, neurodegenerative disorders, HIV/AIDS, and cancer (McAliley et al., 2000; Carter et al., 2004; Rallison & Moules, 2004). These numbers suggest that, estimating conservatively, about 100,000 American parents are left to grieve the loss of a child each year (Fletcher, 2002). In many cases, siblings, grandparents, and other family members are also profoundly affected, and Seecharan et al. (2004) report that, when including such extended family members, approximately 19% of the U.S. adult population has experienced the death of a child.

In many different studies, parents have described the death of a child as a unique, complicated, stressful, dramatic, profound, disruptive, and devastating experience (Gilliss et al., 1997; Znoj & Keller, 2002; Dyregrov, 2004; Arnold et al., 2005; Hinds et al., 2005). In her landmark cross-sectional study in 1979, Sanders found that parents suffer more intense grief after the death of a child than other adults do after the death of either a spouse or a parent (Sanders, 1979; Middleton et al., 1998; Sirki et al., 2000; Fletcher, 2002; Seecharan et al., 2004). A similar, but longitudinal study, conducted by Middleton et al. (1998), confirmed Sanders' findings at 1 month, 10 weeks, 7 months, and 13 months after the death of a child. Other studies suggest that parental grief is typically more intense for those going through it than is the loss of any other adult including friends, partners, and adult siblings (Sirki et al., 2000; Fletcher, 2002; Seecharan et al., 2004).

Several studies report that the intense emotions characterized as parental grief may last from 1 to 9 years after the child's death (McClowry et al., 1987; Theut et al., 1989; Gilliss et al., 1997; Laakso & Paunonen-Ilmonen, 2002), but many others suggest that feelings of sadness and loss remain throughout the bereaved parent's life, that is, "grief gets different, it doesn't get better" (Talbot, 1996; Woolley, 1997; Romesberg, 2004, p. 163; Arnold et al., 2005). Talbot (1996) describes the experience as "remaining in a perpetual state of bereavement" (p. 67) A study by Neidig and Dalgas-Pelish (1991) clearly illustrates this point. They found that parents who had lost a child 2–20 years prior to the interview had grief scores (The Texas Revised Inventory of Grief Part II: Present Feelings) similar to those of parents who has lost a child only 3 months to 2 years prior to entering the study.

Table 1 provides an illustration of this disagreement and a sample of the variety of research findings on the duration of grief in parents who have lost a child. Lang et al. (1996) suggest that the disagreement is likely due to the relatively small number of studies on parental bereavement and the fact that the majority of them are cross-sectional in nature, each focusing on a separate time frame in the grief experience.

Three primary causes for the unique intensity of parents' grief responses have been proposed in the literature, including disruption of the natural order, parental feelings of failure, and interruption of the family structure. Disruption of the natural order refers to the fact that in most developed nations, since early in the 20th century, the death of a child has become a relatively rare event (Davies, 2004).

Table 1. *Disagreement among authors about duration of parental grief*

Study	Length of parental grief
Arnold et al. (2005)	Grief is "ongoing in the life of a parent whose child has died" (p. 245)
Dyregrov & Matthiesen (1991)	Grief is significantly lessened at 1 year after the child's death
Hasui & Kitamura (2004)	Remainder of the parent's lives
Imara (1983)	Normal grief may last 3–4 years after the child's death
Kreicbergs et al. (2007)	The majority of parents reported they had worked through their grief "a lot" or "completely" by 4–9 years after the child's death
Martinson et al. (1991)	2–7 years after the death of the child
McClowry et al. (1987)	7–9 years after the death of the child
Romesberg (2004)	Process is individual. Unknown time frame
Rubin (1993)	Remainder of the parent's lives
Sirki et al. (2000)	Significant relief after second anniversary of child's death
Vance et al. (1995)	Grief is significantly reduced by 8 months after the child's death. Grief is more intense in mothers at 2 and 8 months

Parents expect to die before their children, so when the "natural" process is reversed, society, including the parent's social support system (friends, relatives, religious organization, and even health care providers) is unprepared to respond appropriately to the grieving parent's needs (Fletcher, 2002; Davies, 2004). This lack of support leaves parents vulnerable to complicated grief responses and potentially to adverse health outcomes.

Second, the theory of parental feelings of failure refers to the parent's inability to prevent the child's death and to fulfill the role of protector. Though this may vary with cause of death (sudden or accidental, acute illness, or prolonged decline from a chronic condition), the resulting guilt may compound grief emotions and overwhelm the parent's coping mechanisms (Fletcher, 2002; Hasui & Kitamura, 2004). Third, interruption of the family structure leaves the parent without the stability provided by their familiar and comfortable household, which again can leave them vulnerable to psychological stress and complicated mourning. Grieving parents must not only work to overcome intense sadness and loneliness after the loss of a child, but also must reorganize and restructure family roles and responsibilities to compensate for the absent member (Fletcher, 2002; Lang et al., 2004).

While theories are under study regarding the causes of complicated grief in parents, much disagreement exists in the literature about how that grief affects the physical health and well-being of the parents. Some researchers such as Birenbaum et al. (1996) and Kvikstad and Vatten (1996) suggest that parents' physical health is not adversely affected by such a death, whereas other studies suggest that bereaved parents are at increased risk for a decline in physical health (Birenbaum et al., 1996; Kvikstad & Vatten, 1996; Murphy et al., 1999, 2003; Znoj & Keller, 2002; Lang et al., 2004). Murphy et al. (1999) found that 81% of mothers and 85% of fathers reported their health as "excellent" 1 year after a child's death; however, she also notes that in her study, 70% of mothers and 53% of fathers report visiting a physician for care during the early stages of bereavement.

Other studies have presented findings suggesting that bereaved mothers may be more at risk for developing an illness, for having difficulty recovering from an injury or illness, and for dying of a disease than their peers who have not lost a child (Birenbaum et al., 1996; Murphy et al., 1999, 2003; Znoj & Keller, 2002; Lang et al., 2004), and that bereaved fathers may be more at risk for death from unnatural causes such as suicide, accident, or homicide than are their nonbereaved peers (Goodenough et al., 2004). Many of these findings, however, have also been criticized by those suggesting that the adverse health outcomes are typically psychosomatic in nature or related to risky behaviors (Birenbaum et al., 1996).

This article provides a review and analysis of the current conflicts in the literature and will address the associations between parental grief and health outcomes, including mortality risk and morbidity.

METHODS

Initially, a search was conducted using OVID-Medline (1996–November Week 2, 2007), CINAHL (1982–December Week 1, 2007), and PsycINFO (1967–December Week 3, 2007) using variations of the terms "parental grief and bereaved parents" combined with "health," "illness," "morbidity," and "mortality." All causes of death were included. Subsequently, the bibliographies of each source were reviewed for more potential sources. Thirty-four articles were initially identified in the search. However, after reviewing the titles and abstracts, only 17 articles were deemed appropriate for inclusion in the review. Table 2 contains a complete list of reviewed articles.

In narrowing the field of articles, nine were excluded because the authors defined parental grief as grief of a child who had lost one or both parents.

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Table 2. *Reviewed articles with measures and findings*

Study	Measures	Follow-up	Findings
Birenbaum et al. (1996)	Duke–UNC Health Profile	1 year	Parents' health is not adversely affected by the death of a child
Davies (2006)	Qualitative case studies	Cross-sectional	Highlights two cases in which parents attempted suicide using opiod medication that had been prescribed for their deceased children.
Kreicbergs et al. (2004)	Postal questionnaire created by authors; used some questions from CESD	Cross-sectional	Increased risk of anxiety and depression in bereaved vs. nonbereaved parents. Increased risk of anxiety and depression 4–6 years vs. 7–9 years after the child's death.
Kvikstad & Vatten (1996)	Cox Regression	19 years	No difference in the relative risk of cancer between bereaved mothers and nonbereaved mothers. Also no difference in survival between the two groups
Levav et al. (1988)	Mortality rate in bereaved parents vs. general population in Israel	8–12 years	No excess in mortality in bereaved parents vs. general population
Levav et al. (2000)	Cancer incidence	New diagnosis 14–21 years; mortality 17–24 years	Increased risk of lymphatic and hematopoetic CA in parents of accident victims and those killed in war. Increased risk of respiratory CA in parents of accident victims. Increase in both groups in death from CA if diagnosis before loss, not after.
Li et al. (2002*a*)	Denmark National Register, Cox Proportional Hazard Analysis	18 years	Bereaved and nonbereaved had similar rates of MI first 6 years follow-up. Bereaved had increased risk of fatal MI (RR 1.58) and first MI (1.31) for 7–17 years follow-up.Parents who lost children unexpectedly had higher RR.
Li et al. (2004*a*)	Denmark National Register, Cox Proportional Hazard Analysis	18 years	Bereaved parents had increased risk of MS (HR 1.56). Parents who lost a child unexpectedly had significantly higher HR (2.13) vs. parents who expected loss HR (1.33)
Li et al. (2002*b*)	Denmark National Register ICD7 Codes, Cox Proportional Hazard Analysis	18 years	Increased overall malignancy risk for bereaved mothers (RR 1.18). Increase risk of smoking related CA (RR 1.65)
Li et al. (2003*a*)	Denmark National Register, Cox Proportional Hazard Analysis	18 years	No difference in survival with CA among bereaved and nonbereaved parents
Li et al. (2003*b*)	Denmark National Register, Cox Proportional Hazard Analysis	18 years	No difference in risk of stroke (hemorrhagic or non) (fatal or non) between bereaved and nonbereaved parents
Li et al. (2004*b*)	Denmark National Register, Cox Proportional Hazard Analysis	18 years	No difference in frequency of exacerbation or duration of hospitalization between bereaved and nonbereaved parents
Murphy et al. (1999)	Paper-pencil questionnaire derived from existing instruments and/or created for the study	24 months	1 year postdeath of child: 81% of mothers and 85% of fathers rate their health as good to excellent. However, bereaved parents are more likely than nonbereaved parents to rate their health as poor.
Murphy et al. (2003)	Brief Symptom Inventory, Trauma Exp scale, Rosenberg Self-Esteem	60 months	13% of bereaved parents expressed suicidal ideation (highest rates in parents of accident victims and homicides—not suicides)
Qin & Mortensen (2003)	Danish longitudinal registers	16 years	In the general population, being a parent is protective against suicide; however, parents who have lost a child are at increased risk for suicide.

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Table 2. *Continued*

Study	Measures	Follow-up	Findings
Vance et al. (1994)	Authors created questionnaire	Cross-sectional. Design (2 months after child's death)	Greater frequency of sedative drug and alcohol use in bereaved parents, particularly in SIDS group.
Vance et al. (1995)	Delusions-Symptoms-States Inventory	8 months	Differences in mothers and fathers at 8 months postloss. Mother significantly different from controls, fathers not.

Seven were excluded because they focused on mortality as child death rather than parent's risk of death after losing a child. Finally, one article could not be located and so was excluded. No review articles were identified on the topic or included in this review.

RESULTS

Parental Grief and Mortality

Eight of the 17 articles reviewed discussed parental mortality after the death of a child. Four studies found an increased risk of death in bereaved parents both by suicide and from illnesses including cancer and myocardial infarction (MI; Levav et al., 2000; Li et al., 2002*a*; Qin & Mortensen, 2003; Davies, 2006) and four studies found no significant difference in mortality risk between bereaved parents and the general population in either all-cause mortality or from specific illnesses including cancer and stroke (CVA; Levav et al., 1988; Kvikstad & Vatten, 1996; Li et al., 2003*a*, 2003*b*).

All authors who investigated suicide and suicidal ideation agreed that bereaved parents are at higher risk for completed suicide than are members of the general population. Qin and Mortensen (2003) note that although being a parent is protective against suicide in the general population, the risk of suicide in parents increases significantly above that of the general population if the child dies, especially if the child is young (age 1–6 years) at the time of death (odds ratio [OR] 4.88, 95% confidence interval [CI] 3.23–7.39). Although more investigation is needed into the methods of suicide employed by this population, Davies (2006) suggests that the movement toward home-based palliative care has helped to increase parents' risk of death by suicide after the death by providing grieving parents with increased access to potentially lethal doses of opiods—those prescribed to control the pain of their dying children.

The disagreements, on the other hand, that exist in the literature regarding risk of mortality in bereaved parents primarily concern risk of death from cancer and cardiovascular events (stroke and MI). Levav et al. (2000) found an increase in risk of death from cancer if the diagnosis was made prior to the death of their child, but no significant increase if the diagnosis was made after the child had already died. Kvikstad and Vatten (1996), however, found no increased risk of death from cancer in bereaved parents, but their study included only parents diagnosed with cancer after the loss of a child. Thus, their findings actually did not conflict with those of Levav et al. Further study is needed in this area to confirm or reject the hypothesis that parents diagnosed with cancer before losing a child have increased risk of death, whereas others do not.

The other area of disagreement among studies surrounds major cardiovascular events including myocardial infarction and CVA. Both articles reporting findings about cardiovascular-related mortality in bereaved parents came out of the same study in which Cox Proportional Hazards analyses were performed on data from the Denmark National Register. J. Li was the primary author on several papers resulting from this study. In the first article, Li et al. (2002*a*) present a study of the risk of fatal myocardial infarction in parents who lost a child. Similar rates of fatal MI between bereaved parents and matched controls were noted for the first 6 years of follow-up; however, from follow-up years 7–17, bereaved parents were significantly more likely to suffer a fatal MI than were controls (relative rate [RR] 1.58, 95%CI 1.08–2.30).

Unlike the findings for MI, Li et al.'s (2003*b*) findings regarding risk of fatal CVA in bereaved parents were nonsignificant. They found no increased risk of death from stroke (hemorrhagic or nonhemorrhagic) among bereaved parents versus their matched control group.

The use of the "hard" outcome, mortality, strengthened all of these studies because it is not often misdiagnosed, nor is it subject to the subjective interpretation found in self-report questionnaires. The use of the reliable national registry data by Li et al. also strengthened their analyses because the

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data set is both large and well managed by the government. The very limited number of studies in this field, however, provide very little support for the relationship between the psychosocial insult of a child's death and subsequent risk of death in the parents. More research is needed to provide a better understanding of the existence of a relationship and potential mechanisms that contribute to the linkage.

Parental Grief and Morbidity

Thirteen of the 17 articles reviewed discussed morbidity in bereaved parents after the death of a child. Nine studies found an increased risk of illness (including anxiety, depression and suicidal ideation, cancer, nonfatal myocardial infarction, multiple sclerosis, drug/alcohol abuse) and/or poor health self-ratings among bereaved parents (Vance et al., 1994, 1995; Murphy et al., 1999, 2003; Levav et al., 2000; Li et al., 2002*a*, 2002*b*, 2004*a*; Kreicbergs et al., 2004), and four found no significant excess risk for morbidity from specific diseases (cancer, nonfatal CVA, and exacerbation of inflammatory bowel disease) in parents who had lost a child versus those who had not (Birenbaum et al., 1996; Kvikstad & Vatten, 1996; Li et al., 2003*b*, 2004*b*).

The findings of all authors examining adverse psychological outcomes including anxiety, depression, and suicidal ideation agree that bereaved parents are at higher risk for psychological disorders after the death of a child than are control parents of live children (Vance et al., 1995; Murphy et al., 2003; Qin & Mortensen, 2003; Kreicbergs et al., 2004; Davies, 2006). Measurement of symptoms of psychological disorders was based primarily upon questionnaires created by the researchers drawing on the Center for Epidemiologic Studies Depression (CESD) Scale, though Vance et al. (1995) reported use of the Delusions-Symptoms-States Inventory of Anxiety and Depression (Bedford & Foulds, 1977) and Murphy et al. (2003) used the Brief Symptom Inventory (BSI; Johnson et al., 1996). Although these instruments have all been validated and it seems reasonable to assume that bereaved parents would be anxious and/or depressed, none of the studies mentions the use of a medical (psychiatrist/psychologist) exam or International Classification of Diseases (ICD) diagnosis code as "hard" evidence of the outcome of interest.

Four other morbidities were examined in the reviewed articles, but sufficient findings do not exist on any specific illnesses examined to provide a thorough exploration of the relationship between parental grief and illness. However, this review will provide a look at the literature that exists so far. Single studies reviewed the incidences of multiple sclerosis (MS) and exacerbation of inflammatory bowel disease (IBS). Although psychological stress is commonly thought to be related to or to facilitate exacerbations and worsening of both conditions (Li et al., 2004*a*, 2004*b*), in the study of bereaved parents, Li et al. found a relationship between parental bereavement and MS incidence, but not bereavement and length of hospitalization for IBS.

Two studies were completed in which the researchers examined cardiovascular (CV) morbidity outcomes (nonfatal MI and nonfatal stroke) in bereaved parents. Like the CV mortality outcomes, both of the CV morbidity articles were based on the large population-based study completed in Denmark (Li et al., 2002*a*, 2003*b*). Findings from the study revealed that similar rates of nonfatal MI were noted in both bereaved parents and in matched controls for the first 6 years of follow-up. However, from years 7–17 of follow-up, bereaved parents were significantly more likely to suffer a nonfatal MI than were controls (RR 1.31, 95%CI 1.09–1.57). Li et al. (2002*a*) suggest that these findings lend support to the body of literature linking high levels of stress to adverse cardiac events.

In direct contrast to the stress literature and Li's MI findings, however, Li et al. (2003*b*) found no increased risk of either hemorrhagic or nonhemorrhagic nonfatal CVA in bereaved parents when compared to matched controls, even after 18 years of follow-up. So the link between death of a child and subsequent adverse cardiovascular outcomes in parents is not well established and requires further study.

Finally, the most clear example of disagreement in the literature regarding parental grief and morbidity health outcomes is in the area of cancer. Cancer is also the most thoroughly examined morbidity risk for bereaved parents, with three articles on the subject. Two studies (Levav et al., 2000; Li et al., 2002*b*) reported increased cancer risk in bereaved mothers, whereas one (Kvikstad & Vatten, 1996) found no significant difference in relative risk between bereaved and nonbereaved mothers. It is interesting to note that though they reported opposing findings, both the study by Li et al. (2002*b*) and the study by Kvikstad and Vatten (1996) were population-based studies in similar countries (Denmark and Norway, respectively) using national registries, matched controls, and Cox Proportional Hazard Analysis.

Overall, a greater number of studies (nine) reported findings that support the hypothesis that a relationship exists between parental grief and morbidity. However, it is clear that there are still large gaps in this area of research and further study is necessary.

DISCUSSION

This review of the literature on risk of morbidity and mortality in parents who have lost a child reveals that both commonalities and significant disagreements exist as part of the current state of the science. Most researchers appear to be working with the assumption that the death of a child acts as a psychological stressor to the parents, and it has been hypothesized that this stress may adversely affect health either directly through immunologic pathways or indirectly by encouraging or contributing to risky health behaviors such as poor diet and exercise habits (Baum & Grunberg, 1995; Cohen et al., 1995; Li et al., 2003*b*). From this review, it is clear that more consistent, well-designed research is needed to allow for more comparison among studies to occur and for the risks a child's death poses to parents' health to be fully identified and more thoroughly understood.

Three primary areas of concern with existing studies have surfaced during this review including lack of consistency in measurement for psychological (particularly grief) variables and "soft" self-report health outcomes, questionable methodologies in bereavement research in general, and the lack of a uniform definition of bereaved parents.

Measurement of Parental Grief and Outcomes

First, with regard to measurement, the use of grief instruments to measure parents' psychological distress after the loss of a child is of great concern. Lang et al. (1996) report that many of the grief inventory instruments commonly used in research studies were developed based upon women's grief experiences and may not accurately capture fathers' perspectives on grief . Additionally, many researchers examining psychological or self-report health outcomes report using scales created by the authors for the purpose of their own studies (Vance et al., 1994; Murphy et al., 1999; Kreicbergs et al., 2004). Though some state that their new instruments are based on valid and reliable instruments such as the CESD and BSI, no formal psychometric testing of the newly created instruments was reported in the literature, and the reader is left wondering whether the new instrument appropriately captured the variable of interest in both parents. This concern is lent further support when the reader considers that though several of the studies reviewed here do report differences in self-report outcomes between the mothers and fathers, mothers' grief and distress scores are typically higher (Vance et al., 1994; Birenbaum et al., 1996; Kreicbergs et al., 2004). It is unclear whether these measurements truly reflect more distress and poorer health in mothers or whether the instruments failed to appropriately capture the fathers' experiences.

A similar weakness in this area was that several studies utilized "soft" health and morbidity outcomes that were based on self-report such as the Duke–UNC Health Profile (Birenbaum et al., 1996), the BSI (Murphy et al., 2003), and the Delusions-Symptoms-States profile (Vance et al., 1995). Although these instruments have all had sound psychometric analyses, the results would have been more substantive and more strongly evidence based if outcomes had included "hard" measures such as presence or absence of disease in addition to the self-report measures, or if soft findings such as anxiety and depression had been confirmed by physicians, medical record review, or analysis of health care utilization.

Methodological Challenges

The second area of concern identified in this review is methodological challenges in working with a population of bereaved parents. The most commonly noted methodological challenges in parental bereavement literature, including small sample size, retrospective design, and limited follow-up, are all present to some degree in the articles reviewed here. Many of the studies included in this review were population-based studies that utilized national registry data with hundreds of thousands of subjects, but others fell victim to the common methodological problem of small sample size. Because since the early 20th century the death of a child has become an uncommon occurrence in developed nations, it can often be difficult to recruit an adequate sample size in a single hospital setting. Sample sizes in this review ranged from as few as 80 subjects (Birenbaum et al., 1996) to 21,062 bereaved parents and greater than 300,000 controls in the population-based studies. Although the population-based studies are helpful and feasible in countries with socialized medicine and national registries such as in Denmark, Norway, and Israel, currently such research is difficult if not impossible with bereaved parents in the United States because national health data are available only for those with Medicare or Medicaid coverage, which includes primarily the elderly and those with low levels of family income. This suggests the need for more concerted effort to create large data sets that will help researchers to capture the bereavement experience of parents in the United States.

The second methodological concern is that prospective studies are typically preferable to retrospective ones whenever possible. The majority of studies on parental bereavement and health have been done retrospectively; however, because most have

investigated the bereaved parents of children who died suddenly and unexpectedly, it was not possible to identify these parents before the bereavement event. A single study, however, by Birenbaum et al. (1996) employed a prospective study design in which the researchers collected data on parent's health before the death of their child from cancer and at three points during the first year after the child's death. The design, however, did not seem to function as it was intended, as a baseline measure of health from which bereavement would theoretically contribute to changes. This is because the parents were recruited when the child was very near death, sometimes within a few hours. (In one case, the child died the same day the parents enrolled in the study.) These parents were expecting the death of the child and were likely already in a state of anticipatory grief, which may already have affected their health status. This consideration casts doubt on their findings that "parents' health was not adversely affected by a child's death from cancer" (p. 105).

The final methodological concern of interest is related to the length of follow-up for many studies. At the time children are born, most parents are in their 20s and 30s, a typically healthy age for most people. Therefore, if children die before they turn 18, overall, parents are still in a relatively healthy age group. So, it would be expected that a fairly long-term follow-up would be necessary to capture any potential increased risk of disease such as cancer, stroke, adverse cardiovascular events, or psychological disorders and risky behaviors in this population. However, other researchers have also noted that length of time since the child's death could play a role in risk of morbidity and mortality in bereaved parents (Murphy et al., 2003), so the optimum follow-up time remains unclear.

In the studies examined in this review, the authors used a wide variety of follow-up times. Whereas some researchers who used national registry data boasted follow-up times of 18–24 years (Levav et al., 2000; Li et al., 2002*b*), others used cross-sectional designs that included data collection at a single point after the child's death and no follow-up (Vance et al., 1994; Kreicbergs et al., 2004) or utilized follow-up times as short as 8 months (Vance et al., 1995), 1 year (Birenbaum et al., 1996), 2 years (Murphy et al., 1999), or 60 months (Murphy et al., 2003), but that did not appear adequate to capture morbidity and mortality outcomes. A complete list of follow-up times is available in Table 2.

Definition of Child

The third and final concern identified in this review is the lack of a consistent definition of *child* among studies. It is unclear whether *child* should refer only to those individuals less than 18 years old or to any person with a living parent. To make this review as thorough as possible, all articles on bereaved parents were selected—including two articles that examined bereaved parents of adult children who had died either in an accident or in a war (Levav et al., 1988, 2000). As was stated earlier, many studies have suggested that once a parent loses a child, he (or she) remains a "bereaved parent" for the rest of his (or her) life (Rubin, 1999; Levav et al., 2000; Hasui & Kitamura, 2004); however, several researchers have raised the issue that the age of the child at the time of his or her death might potentially affect the parents' grief process and risk for adverse health outcomes (Murphy et al., 2003).

One study found that the highest risk of morbidity in the form of poor mental health and suicide was in parents of children who died at very young ages (Qin & Mortensen, 2003), but the study did not include bereaved parents of adult children. Similarly, Levav et al. (2000) found an increased risk of death from cancer in bereaved parents of adult children, but this study did not include bereaved parents of children under the age of 18 years and it disagrees with the findings of Li et al. (2003*a*), who examined bereaved parents of young children and found no difference in cancer survival in that group compared to matched controls. Clearly, more research is needed in this area to determine the most appropriate inclusion criteria for studies of bereaved parents, which will allow for optimum comparison among studies.

Limitations

This review is limited by the very small amount of literature on health outcomes in bereaved parents. The strongest of the existing literature focuses on predominately white, wealthy, European countries with socialized medical care and parents of children who died unexpectedly or tragically. Although this review depicts the overall health risks for parents who lose a child, it remains unclear to what extent various aspects of deceased children and their families such as culture (Costa et al., 2007), socioeconomic status (Koop & Strang, 1997), mode of reimbursement (public or private insurance), cause of death (Zisook et al., 1998), enrollment in hospice (Christakis & Iwashyna, 2003), and involvement in care (McCorkle et al., 1998) play a role the subsequent health of parents.

Conclusions

The literature provides very mixed results on the relationship between parental grief and subsequent morbidity and mortality risks to the parents. This review and analysis revealed that, in general, many of the current studies have several problems, which

may make their results questionable and/or unreliable. These include biased grief measurement tools, methodological concerns such as small sample size, retrospective design, and inadequate follow-up periods, and lastly, indecision about the comparing of literature concerning bereaved parents of adult children with that concerning bereaved parents of young children. Additionally, this review revealed a gap in the parental bereavement literature. Characteristics of the deceased child and family and circumstances surrounding the child's death have yet to be examined in relation to parental grief, and it remains unclear whether these variables play a role in the subsequent health of parents.

Based on these findings, it is clear that more methodologically sound research is necessary to clarify the relationship between parental grief after the death of a child and the parents' subsequent morbidity and mortality risks.

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