A Benefit Cost Analysis of Mental Health Outcomes of the Family Bereavement Program

by

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ABSTRACT

The current study was a benefit cost analysis that examined mental and behavioral health and prescription drug service use data of 347 participants (212 youth and 135 caregivers) from a bereavement intervention, the Family Bereavement Program (FBP).The preliminary goals of the current study were to compare the FBP intervention and the Literature Control (LC) groups at the six year follow-up on: (a) number of participants using mental/behavioral health services and prescription drugs, (b) the frequency of use of mental/behavioral health services and prescription drugs, and (c) the costs of mental/behavioral health services and prescription drugs. The final, and primary goal, was to (d) calculate the benefits of the FBP by analyzing the monetary difference between the LC and FBP groups in terms of cost of services used and then by applying those benefits to the cost of the intervention.

Data representing participating youths' and caregivers' mental health service use and prescription drug use at the sixth year post-intervention were collected, as were the costs of those services. Results indicated that fewer FBP participants used services and prescription drugs than the Literature Control (LC) participants, but FBP participants, particularly the youth, used some low intensity services more frequently whereas the LC youth used more intensive and costly services more frequently. Consequently, service costs were greater for participants in the LC group than for participants in the FBP group. The benefit cost ratio revealed that the FBP, as delivered, saved society between $.15 and $.27 in mental and behavioral health costs for every dollar spent on the intervention. Implications of these findings and directions for future research are discussed.

To Barry, who has only known me as ‘crazy busy, hectic, juggling work/school/personal/professional responsibilities and stressed all the time’ Michèle, yet fell in love with me anyway. Thank you for your unwavering belief in me, your support and your love these past six years. I can’t wait to introduce you to ‘calm, relaxed, peaceful and most importantly, FUN’ Michèle!

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TABLE OF CONTENTS

Page

LIST OF TABLES

Table Page

INTRODUCTION

The death of an immediate family member can be one of the most traumatic and stressful events for the remaining family members. This is particularly true for youth who have lost a parent or caregiver and for the surviving parent or caregiver (Dowdney 2000; Dowdney, Wilson, Maughan, Allerton, Schofield, & Skuse, 1999; Stroebe, Schut, & Stoebe, 2007). According to the Social Security Administration (2000), in the United States, an estimated 3.5% of youth under the age of 18 have experienced the death of a parent (73.9% death of a father, 25% death of a mother, and 1.1% have experienced the death of both parents). Spousal bereavement affects just over 900,000 people per year in the United States (Kung, Hoyert, Xu, & Murphy, 2008). The death of a parent/spouse can affect all aspects of the family structure and dynamics including interpersonal relationships among remaining family members, family roles, the parent child relationship, the family economic status and family functioning as well as psychological health of family members (Lutzke, Ayers, Sandler, & Barr, 1997; Tremblay & Israel, 1998; Yamamoto, Davis, Dylak, Whittaker, Marsh, & van der Westhuizen, 1996).

Parental loss deprives youth of significant emotional interactions, and leaves the remaining parent or caregiver ill-equipped to handle the loss and unprepared to take on the roles and responsibilities of the deceased parent (Tremblay & Israel, 1998). Parental bereavement is a risk factor that can lead to a multitude of poor outcomes including depression (Dowdney, 2000; Dowdney et al., 1999; Gersten, Beals, & Kallgren, 1991; Kranzler, Shaffer, Wasserman, & Davies, 1990), anxiety (Kanzler, Davies, Wasserman, & Shaffer, 1987; Worden & Silverman, 1996), externalizing behaviors and academic problems (Dowdney et al., 1999; Silverman & Worden, 1992) in parentally bereaved youth. Similar problems, such as depression (Bonanno et al., 2002; Charlton, Sheahan, Smith & Campbell, 2001; Dowdney, 2000; Genevro, 2004), anxiety (Christakis & Iwashyna, 2003; Dowdney et al., 1999; Zisook & Schuchter, 1985), and grief (Genevro, 2004, Prigerson et al., 1997; Stroebe et al., 2005) are common for the surviving spouse. Helping parentally and spousally bereaved families adapt is an important concern to relatives, friends, schools, communities as well as to researchers. There are multiple resources for support of parentally and spousally bereaved families in the United States. For example, the Dougy Center for Grieving Children and Families (2010) lists over 500 centers that provide grief counseling and services across the US. These centers provide many different types of services including art and pet therapy, peer support, one on one counseling and interventions, all focus on helping families adjust to the death of a loved one. However, preventative interventions that are empirically sound are few.

The paucity of evidence-based bereavement interventions led the researchers at the Prevention Research Center at Arizona State University to design, develop and test the Family Bereavement Program (FBP; Sandler et al., 2003); an intervention based on theory, empirical evidence, and knowledge. The Family Bereavement Program has shown success in ameliorating risk factors associated with poor outcomes of bereaved families by improving mental health outcomes (Ayers & Sandler, 2003; Ayers, Kennedy, Sandler, & Stokes, 2003; Sandler, Ayers, & Romer, 2002; Sandler et al., 2003; Schmiege, Khoo, Sandler, Ayers, & Wolchik, 2006). The current study assesses the cost effectiveness of the FBP based on the service use data collected from the six year follow up of 156 families who participated in the original intervention.

The goal of most preventive interventions is to eventually move from trial, efficacy and effectiveness studies to dissemination into community settings. Funding agencies and policy makers are often interested in how much an intervention will cost to deliver in a community setting (Foster, Porter, Ayers, Kaplan, & Sandler, 2007). Funding agencies and policy makers are also interested in what the costs and benefits of an intervention program are in relation to the individual, the agency, and to society at large. One way to demonstrate these costs and benefits is to examine the cost of the intervention and the costs that are averted by the intervention; the costs that are averted are considered benefits. Averted costs are calculated by assessing the cost of service use for the intervention group and comparing it to the cost of service use for the control group. The differences between the groups in these averted costs are the benefits. For this study, the costs of mental and behavioral health and prescription drug use were examined. By investigating the mental and behavioral health service utilization and prescription costs averted for participants in the Family Bereavement Program, we will be able to better inform funding agencies and community resources about the benefits of adopting and implementing this program, which has demonstrated success in reducing multiple risks in parentally bereaved families.

LITERATURE REVIEW

This literature review has several purposes. First, it is important to examine the outcomes for bereaved spouses and youth to elucidate the need for bereavement interventions. Next, the foundation for this study is reviewed by examining theoretically-based bereavement interventions, focusing specifically on the Family Bereavement Program. Finally, an evaluation of the economic evaluation research and the theory underlying benefit cost analysis, as well as the importance of using this methodology when evaluating prevention programs, is discussed. This review will provide the basis for supporting the hypotheses to be tested in this study—namely, hypotheses about the costs averted and benefits realized by participation in the Family Bereavement Program.

Family Bereavement: Effects on Spouses and Youth

The loss of a parent or a spouse has multiple significant negative effects on all members in the family, particularly spouses and youth. These effects include elevated risk for mental health problems and difficulties in daily living, such as depression, anxiety impaired role functioning and parenting ability (Bonnano et al, 2002; Kissane et al., 1996; Marks, Heyjung, & Song, 2007; Zhang, El-Jawahri, & Prigerson, 2006). Bereavement has a direct effect on spousal and youth mental health, but when the surviving spouse experiences mental health difficulties, their youth are at even greater risk for mental health difficulties because the mental health, adaptive functioning, and positive parenting skills of the surviving spouse are crucial for family functioning. Thus, the caregivers' mental health and functioning can either maximize or minimize their youth's mental health functioning (Breier, Kelsoe, Kirwin, Beller, Woklowitz, & Pickar, 1988; Harris, Brown, & Bifulco, 1986; Schultz, 1999);

Bereavement and spousal mental health. Spousal bereavement is associated with increased depression, anxiety, and other psychological problems for the surviving spouse (Genevro, 2004; Stroebe & Stroebe, 1987; Zisook & Shuchter, 1985). For some individuals, depression, anxiety and complicated grief can linger for years after the death and impair daily functioning, relationships, and mental health (Prigerson et al, 1997; Zhang, El-Jawahri, & Prigerson, 2006). Psychological reactions to the death of a spouse can differ due to many factors, including age (Onrust, Cuijpersm Smit, & Bohlmeijer, 2006), gender (Stroebe et al, 2001), socioeconomic status (Stoebe & Schut, 2001), relationship at the time of death (Carr, House, Wortman, Neese, & Kessler, 2001; Wheaton, 1990) and social support (Cotton, 1999; Stroebe et al., 2007, Stoebe & Schut, 2001). Empirical evidence shows conflicting results about the role that age has on bereavement. In several studies, results revealed that older spousally bereaved individuals displayed more distress than younger bereaved spouses (Onrust et al., 2006; Cotton, 1999). However, other researchers have found that younger bereaved spouses experience more distress (Archer, 1999; Stroebe et al, 2007). Findings about the impact of gender on psychological adjustment are also contradictory (Onrust et al., 2006; Jacobs, Hansen, Berkman, Kasl, & Ostfed (1989); Stroebe et al, 2001). Onrust et al., (2006) found that widows were more likely to have greater distress; whereas in the comprehensive review of the literature that addressed gender differences in adjustment to bereavement, Stroebe and colleagues (2001) found that widowers experience more psychological distress than widows experience.

Marital quality pre-death also plays a role in how the surviving spouse navigates through their grief and psychologically adjusts to the death. Wheaton

(1990) found that those bereaved spouses who had conflictual relationships pre death displayed less grief and psychological distress after death, while Carr and colleagues (2000) found that adjustment (in daily functioning and increased distress) to widowhood was most difficult for those who felt a high degree of warmth and interconnectedness in their marriage before the death. Supportiveness from other family members and friends is also related to adjustment post death. Cotton (1999) found that the perception of non-supportiveness was associated with more emotional problems and depression in the bereaved spouse. Clearly, there are multiple factors that affect the psychological health of a spousally bereaved individual.

Bereaved parents' impact on youth. Even more importantly, there is consistent evidence that following parental death, the quality of the parent child relationship, depression in the remaining parent and new stressors in the family environment are significant predictors of mental health problems in children. Inadequate parenting (inability to provide emotional and other needs for their children) by the bereaved spouse contributes to youth's poor outcomes and parental depression was the strongest predictor of child disturbance (Kranzler et al., 1996). For instance, parental depression contributes to youth depression and other psychopathologies following the death of a spouse/parent (Cerel, Fristad, Verducci, Weller, & Weller, 2006). Downey and colleagues (1999) found that when spousally bereaved parents showed high levels of psychopathology, their children had higher levels of depression, anxiety and other psychiatric disorders than bereaved children whose surviving parent showed lower levels, or no psychopathology. Harris et al., (1986) found in a retrospective study of adult depression and loss of parent, that lack of adequate parental care (e.g., indifference, lack of interest in child, lack of discipline and poor material care) was associated with higher levels of adult depression. Bilfulco, Brown and Harris (1987) replicated the study a year later with the same results; adult depression was associated with lack of adequate parental care after the loss of a parent.

Interactions with the surviving parent and the family environment also influence levels of depression. In another more recent retrospective study of adults who experienced childhood parental death, Saler and Skolnick (1992) found that participants who were able to participate in the mourning process such as being able to express emotion, talk openly with the surviving parent, and attend the funeral were at less risk for developing depression in adulthood than those people who reported less active participation in the activities surrounding the death of their parent. Thus, individuals who did not participate in the mourning process had higher rates of overall depression. Additionally, Saler and Skolnick (1992) found that individuals who describe their surviving parent in positive terms were less likely to report feelings of depression in adulthood. While it is critical for bereaved spouses to adjust to the death, it is equally important for them to help their children to adjust and cope with life after the loss of the deceased parent because parentally bereaved youth are at high risk for poor mental health outcomes.

Bereavement and youth mental health. Early bereavement researchers primarily focused on adults who had experienced parental bereavement in childhood and had manifested psychological symptoms in adulthood such as depression, anxiety and somatic complaints (Birtchnell, 1978; Black, 1978; Brown, Harris, & Copeland; 1977; Dennehey, 1966; Gregory, 1965, 1966; Rutter, 1966; Sood, Weller, Weller, Fristad, & Bowes, 1992). Thus, there has been a preponderance of retrospective studies in the literature about adults who experienced bereavement in childhood. In a retrospective study, the researcher observes an existing outcome and looks backward at risk and protective factors to determine what contributed to the outcome. There are several possible reasons this methodology has been employed for bereavement studies. One reason is that it is an easier method to utilize since it involves only adults and the only criteria for the control group is that they do not have the outcome of interest. Additionally, childhood bereavement is relatively rare; currently only 3.5% of youth under age of 18 have experienced the death of a parent (Social Security Administration, 2000). Therefore, retrospective studies can capture the impact of childhood parental death by looking at the outcome of interest and identifying if one of the risk factors was parental bereavement. Finally, retrospective studies may have been used in the past because the bereavement field was still relatively young, and a relationship between childhood parental bereavement and adult symptomatology had not been established.

Depression is the primary mental health outcome that has been studied as it relates to bereavement. There are several possible reasons for studying depression as an outcome. Most investigators agree that there is a normal progression of grief which includes feelings of deep sadness and often, symptoms of depression such as agitation, sleeplessness, and moodiness. It is when the depression becomes debilitating and chronic and it interferes with daily activities that it turns into a problem. Other likely reasons that depression has been extensively studied as it relates to bereavement are that depression may compel a grieving person to seek professional help. Likewise, depression is a symptom that is readily observed and can cause concern for the person suffering from it. Depression can also be evaluated by using well known and tested measures so it is an outcome that is easy to diagnose. Many retrospective studies that examine parental bereavement have studied depression as the outcome of interest.

Retrospective studies of adults who lost a parent during childhood build on the historical studies of the relation between parental bereavement and mental illness (Beck, Sethi, & Tuthill, 1963, Dennehy, 1966). For instance, bereavement researchers in the early 1960’s found that when samples of depressed people were compared to samples from the general public, depressed individuals were more likely than non-depressed individuals to have experienced parental death in childhood (Beck et al., 1963; Dennehy, 1966). Beck and colleagues (1963) interviewed and administered depression assessments to 297 patients from psychiatric clinics and hospitals in Pennsylvania. In addition to the entrance assessments and interviews, patients were specifically asked whether their parents were living and if they were not, the patient was asked their own age at the time of their parents’ death. The researchers found that there was a significantly greater incidence of parental loss during childhood in the highly depressed group compared to the non-depressed patients. In another example, Dennehy (1966) studied the incidence of bereavement in a psychiatric population. Patients were interviewed upon admission to one of three London hospitals and asked a series of questions related to loss of a parent. She gathered data on the type of loss (divorce, abandonment and death), age of the parent at death, sex of the deceased parent and age of the patient at the time of death. Dennehy (1966) found that father loss was significant in male and female depressives and maternal loss was significant in male depressives. These findings led researchers to believe that early parental death leads to adult depression.

Although the studies cited to this point converge with early historical bereavement research in suggesting a link between loss of a parent in childhood and problematic mental health outcomes (notably depression) (Beck et al., 1963; Dennehy, 1966), other studies, using the same retrospective methodology, contradicted this finding (Mireault & Bond, 1992; Pitts, Meyer, Brooks, & Winokur, 1965; Roy, 1978; 1979). For instance, in a study examining the relations between parental death in childhood and adult depression and anxiety, Mireault and Bond (1992) assessed college students who had lost a parent before the age of 18. There were 140 participants in the bereaved group and 239 participants in the control group. Participants were assessed on depression, anxiety, and perceived vulnerability. The researchers found no differences between the bereaved group and the non-bereaved group on measures of depression and anxiety. Similarly, Pitts et al. (1965) found no relation between any type of parental loss, including death, and adult psychiatric disorders, including depression. Moreover, Roy (1978) found that the loss of a mother before the age of 11 was one of four vulnerability factors that predisposed working class women to depression. However, parental loss alone was not significant in predicting depression in Roy’s sample. Rather, it was only related to depression when there was also a poor marital relationship, three or more children under the age of 14 in the home and a lack of full- or part-time employment.

There are many possible explanations for these inconsistent findings. One important explanatory factor has to do with variations in sampling procedures from study to study. Some studies examined psychiatric groups, compared them to control groups, and examined whether there were group differences in parental death (Dennehey, 1966; Pitts et al., 1966; Roy, 1978). Other studies examined samples based on parental death and then studied mental health outcomes such as depression (Mireault & Bond, 1992; Saler & Skolnick; 1992). By employing different sampling procedures investigators could come up with inconsistent findings. For instance, in the case of examining a psychiatric population, determining incidence of parental death and then comparing this subset to a control group who had not experienced parental death, the group differences could be attributed to many other factors and/or the interaction of parental bereavement with environmental variables that imminently follow death such as change in familial structure and relationships, change in economic status and differences in social support (Breier et al., 1988; Pillay & Descoins, 2006; Tennant, Bebbington, & Hurry, 1980).

Additionally in the studies reviewed, there were not uniform diagnostic criteria. This may be due to the retrospective review of case notes of different psychiatrists (Dennehey, 1966; Munro, 1969). Another reason for inconsistent findings was the use of many different types of control groups. Control subjects for some studies were drawn from medical and surgical patients who could have psychiatric comorbidity (Dennehey, 1966; Roy, 1978). Other moderating variables in these studies such as parental age at subject’s birth, subjects’ age at parental death, and social class and marital status may also have confounded the results. For example, parental age at the time of the subject’s birth could play a role in the findings. A subject who was born to an 18 year-old father has different expectations of parental life expectancy than a subject born to a 59 year-old father. The subject’s age at the time of parental death may also make a difference. Birtchnell (1970) found no difference in patients and controls when ages birth to 19 were assessed but significant differences were found when he split the age groups in half. This could mean that the child's age when the parental death occurred could affect mental health outcomes. Finally, social class and marital status could contribute to the differences in findings. Lower social classes have decreased life expectancy due to diet and less access to medical care and riskier employment (Dennehy, 1966). For instance, a physical laborer is at higher risk for being hurt on the job which can contribute to lack of employment which in turn can contribute to poorer access to health care and poorer diets due to lack of funds. Therefore, they would be more likely to die earlier than someone from a middle or higher socioeconomic class. Marital status also can play a role in confounding findings. Youth who grow up in unstable or single parent homes due to death, divorce or abandonment may be at higher risk for poor mental health outcomes in adulthood due to, but not limited to, poor parental monitoring and attention, disruptive familial interactions and lack of consistent discipline or changes in economic status (Pillay & Descoins, 2006; Wolchik, West, Westover, Sandler, Martin et al., 1993; Wolchik et al., 2000; Wolchik et al., 2002). In all of these examples it is difficult to tease apart the factors that contributed to the reported findings.

In addition, many of the bereavement studies were conducted retrospectively (Anderson, 1949; Birtchnell, 1978; Dennehy, 1966; Gregory, 1966; Lindemann, 1944; Mireault & Bond, 1992; Saler & Skolnick, 1992) therefore an individual's recollection of events and circumstances could be affected by the length of time since death, events that have occurred since the death or even faulty memories. Current bereavement research takes into account many of these issues and helps to clarify the inconsistencies found in the earlier bereavement research.

It has not been until the past three decades that researchers have begun to study youth who have lost a parent to death rather than studying adults who were parentally bereaved in childhood. Prospective studies of youth who lost a parent, focusing on bereavement as a risk factor for poor outcomes, have added invaluable findings to the literature base on bereavement and symptomatology. Instead of adults looking back and remembering how they felt, and their symptomatology at the time of their parents' death, studies of bereaved youth can examine what is actually happening now to the youth as they develop.

In the past two decades, investigators have become more interested in examining parentally bereaved youth and the relation between parental loss and mental health outcomes. Current studies examine a wider range of outcomes than some of the earlier retrospective studies of adults who experienced parental death in childhood. Investigators have explored a more comprehensive set of internalizing outcomes as well as externalizing outcomes in their studies of childhood bereavement. These recent studies have shown relations between parental bereavement and internalizing problems such as depression, anxiety, somatic issues, as well as externalizing problems such as conduct disorder in childhood and adolescence (Dowdney, 2000; Dowdney et al., 1999; Gersten et al.,1991; Kirwin & Hamrin, 2005; Marks, Heyjun, & Song, 2007; Silverman & Worden, 1992). In some studies, internalizing symptoms were evident as soon as three months following parental death. However, in some cases symptoms may not emerge immediately; rather, it may take up to two years following the death before symptoms are apparent (Cerel et al., 2006; Rutter, 1966; Worden &

Silverman, 1996). Thus, it is possible that the chain of events that occur after the death, such as restructuring of family roles, monetary changes and transformations in family interactions, contribute to the manifestation of symptoms for bereaved youth (Dowdney, 2000; Dowdney et al., 1999; Rutter, 1966).

Internalizing outcomes of childhood bereavement. A wide array of internalizing symptoms have been associated with parental bereavement in youth. For instance, Dowdney and colleagues (1999), Saucier and Ambert (1986) and Kranzler et al. (1990) found that parentally bereaved youth scored higher on multiple internalizing symptoms than control groups scored. Dowdney and colleagues (1999) found that parentally bereaved youth had higher than expected levels of internalizing problems, with child problem scores on the parent-reported Child Behavior Checklist (Achenbach, 1991) higher than the population mean. Teacher reports also indicated that the bereaved youth had significantly higher internalizing and total problem scores than did the control group.

When examining depression as an outcome, investigators have found robust relations between depression and parental death. In a community-based study of parentally bereaved youth ages 8 to 15, researchers found that the bereaved youth had higher levels of depressive symptoms than that of the comparison group based on a structured diagnostic interview (Gersten et al.,1991). In another longitudinal community-based study of 105 parentally bereaved youth ages 2 to 17, Van Eardewegh, Bieri, Parrilla, and Clayton (1982) found that bereaved youth displayed significantly more depressive symptoms such as crying, irritability, and sadness than the control group. In this study, the youths’ reactions to parental death were measured at one month and thirteen months after the death via structured interviews with the remaining parent. There was a significant increase in depressive moods (crying, irritability and sadness) and sleep difficulties in the bereaved youth. Additionally, in another study of bereaved preschoolers (Kranzler et al., 1990), teachers and surviving parents rated bereaved preschoolers to have significantly higher levels of depressive symptoms than the matched control preschoolers.

Parental death has also been associated with higher anxiety and withdrawal symptoms in youth. In a large study of over 4000 adolescents (ages 12 -19) in Montreal, Saucier and Ambert (1986) found that bereaved adolescents rated themselves as being nervous (anxious) significantly more often than non-bereaved adolescents. Kranzler and colleagues (1990) found that children ages 3 to 6 were rated by their remaining parent and teachers as being more anxious than their non-bereaved peers. Felner, Stolberg and Cowen (1975) also found that teachers rated bereaved youth as being more withdrawn and moody than non-bereaved youth. Finally, youth in the Harvard Child Bereavement Study scored significantly higher on the withdrawal scale of the CBCL than non-hyobereaved youth (Worden & Silverman, 1993; 1996).

Externalizing outcomes of childhood bereavement. Findings are inconsistent about the relation between externalizing outcomes and bereavement in children. Dowdney et al. (1999) found that 58% of the bereaved children scored higher on externalizing behavior than the population mean. Additionally, parents and teachers both scored bereaved children higher on externalizing behaviors on a standard measure than control children scored in a study by Kranzler and colleagues (1990). Similarly, Gregory (1965) found that children who lost their father had significantly higher rates of delinquency than those children from intact homes when police and court records were examined. In addition, Harter (1979) found bereaved children's self-report on the behavioral conduct scale to be significantly different from their non-bereaved matched controls 1 and 2 years after the death of their parent.

However, in the Harvard Bereavement Study there were no significant differences from parent report on either the delinquent or aggressive behaviors between parentally bereaved children and non-bereaved children (Worden & Silverman, 1993; 1996). Furthermore, neither Gersten et al. (1991) nor Van Eerdewegh et al. (1982) found significant differences in their parentally bereaved samples on parents' reports of externalizing behaviors. Thus it appears that the relationship between parental death and externalizing behaviors is less apparent than the relationship between internalizing symptoms and parental bereavement in children.

Interventions for Bereaved Youth

Childhood bereavement is a serious risk factor for many poor outcomes discussed previously. To mitigate the possible negative outcomes of childhood bereavement, preventive interventions that focus on variables that can be modified could be extremely beneficial in protecting youth and their caregivers from internalizing and externalizing problems. To deliberately intervene in a situation to prevent undesirable outcomes or to influence outcomes is considered an intervention. Interventions can take many different forms. However, psychoeducational or clinical interventions are intended to improve the condition of an individual or group of individuals. For example, a group of smokers can participate in a smoking cessation program which will teach them techniques to quit smoking. As another example, parents of disruptive children can participate in a school-sponsored group program teaching them how to effectively discipline and monitor their child to enhance the child's education. When this is done with the purpose of targeting risk factors that contribute to dysfunction and reinforcing protective factors that improve resistance to risk factors and enhance healthy adaptation, it is called prevention science (Coie et al., 1993). The purpose of prevention science is to change or moderate human dysfunction. Because dysfunction is not simply due to one risk factor, but instead due to the interaction of several risk factors (i.e. personal characteristics, family and social environment), preventive interventions must examine multiple sources for risk factors.

There are many different types of bereavement interventions for both individuals and groups aimed at ameliorating the risk factors that death can have on surviving family members. For this study, the focus is on group interventions. In group intervention, the focus can be on peer support, normalization of feelings, opportunity to express feelings, learning new techniques to adjust to life without the deceased person, education about loss and building relationships with other bereaved youth or adults (Black & Urbanowitz, 1995; Cook & Dworkin, 1992; Sandler et al., 1992). Structured group interventions have shown evidence of successfully ameliorating risk factors and have some shared commonalities (Tremblay & Israel, 1998; Zambelli, Clark, Barile, & DeJong, 1998; Zambelli & DeRosa, 1992). These commonalities include parallel adult and child groups, a focus on therapeutic and educational functions as well as providing mutual support for the members (Zambelli et al., 1988).

It is important to develop strong relations between empirically based theory, intervention design and evaluation (Coie et al., 1993). Much is known about the development of mental health problems and the risk factors that contribute to it; by using this knowledge and theory, prevention researchers can develop more effective preventive interventions (Coie et al., 1993). When theory is used to develop interventions, it can enhance the interpretation of results in experimental trials and provide guidance for program redesign (Sandler et al., 1992). Finally, theory contributes to the intervention evaluation by revealing what was successful about the intervention and what was unsuccessful, thus contributing to intervention modifications (James & Brett, 1984).

Development of the Family Bereavement Program. Early research by the Prevention Research Center's Bereavement Core integrated empirically based theory with the group intervention design, which means that the researchers identified the underlying processes that contribute to the development of problems and developed a formal specified model of the causal processes. The first Family Bereavement Program (FBP) study involved testing a theory of the relations between potentially modifiable risk and protective factors and mental health problems for bereaved youth. Based on the literature of risk factors for bereaved youth's likelihood of developing mental health problems, family variables that were targeted as potential mediators were: quality of the relations between the parent and child (parental warmth), parental mental health (parental demoralization), stability of positive family events, and youth's negative life events (Adams, Bouchkoms, & Stiener, 1982; Elizur & Kaffman, 1983; Van Eerdewegh et al., 1982; Sandler, Wolchik, Braver, & Fogas, 1986). The model proposed that there were causal pathways from parental death to these putative mediators. This model was tested on 90 bereaved youth and 20 matched control youth. It provided a good fit to the data using both the parent and child reports (West, Sandler, Baca, Pillow, & Gersten, 1991). The results from this study supported the FBP model and provided evidence to use it as the basis for the FBP intervention program design.

Thus, the FBP intervention was designed to target the four aforementioned putative mediators to change. In addition, child coping was added as a fifth mediator when results revealed that the single strongest predictor in the model was negative life events. Therefore, the five mediators targeted were: parental warmth, mental health problems of the surviving parent, stable positive events, negative life events and child coping. After pilot tests of the intervention were completed, a small experimental randomized efficacy trial of the intervention was conducted. This trial was a family-based home-visit intervention with 72 families (35 in the experimental group and 37 in the control group). Results from this trial indicated that the intervention reduced parental reports of child mental health problems and that improvement in mental health problems was mediated by improved parental warmth (Sandler et al., 1992). Small sample size, use of a waitlist control group design and no facet of the program focusing on youth's coping were some of the limitations of this early study. However, the preliminary results were encouraging and led to a larger-scale randomized experimental trial of a multi-component intervention.

The larger trial was a 5 year study funded by the National Institute of Mental Health and designed to test the efficacy of a revised intervention which targeted parental mediators and child coping, to include adequate sample size to provide sufficient power to test program effects, and to test the continuation of program effects over 11 months (Sandler et al., 2003). After meeting recruitment criteria (see Methods for specific recruitment and sample characteristics) participants were randomly assigned to a treatment or control group. The sample included 244 youth and their caregivers; 135 assigned to the group program (experimental group) and 109 assigned to the self-study program (control group).

The intervention design had components that were selected to change the theoretical putative mediators of child mental health problems. The 12 session program included 4 conjoint sessions with activities for the caregivers and youth. In addition, there were two individual family sessions to discuss the use of program skills in order to accomplish goals participants had selected for themselves. For the caregiver program intervention techniques focused on improving the stable, positive quality of the parent/child relationship, use of effective discipline, caregiver mental health and decreasing youth's exposure to stressful events. For the youth program, intervention techniques focused on positive family activities, improving coping skills, coping efficacy, and problem solving skills. Additionally, this program helped youth to distinguish controllable from uncontrollable events and to use cognitive reframing for non-threatening appraisals.

At posttest, there were significant program main effects or interaction effects on the six mediators: stable positive caregiver-child relationships, discipline, caregiver mental health, coping, active inhibition and observed positive affect. At the 11th month follow up, there were significant program main effects or interaction effects on stable positive caregiver-child relationships, discipline, sharing of feelings, and observed child problem solution. The effect sizes were moderate at posttest (median *d* = .49, range of .30-.52) and at 11-months (median *d* = .41, range of .34-.53). All main effects indicated better scores for the intervention group. There were no significant gender x program interactions or baseline x gender x program interactions on the posttest measures of mediators. However, at the 11th month follow up there were four significant program x gender interactions. Three interactions (coping and threat scores, behavioral observation score on child problem solution and parent attending) showed program benefits for girls but not for boys (Sandler et al., 2002; Sandler et al., 2003).

Cost Evaluation Research and Interventions

Cost evaluation is an overarching term that describes methods of comparing the costs and effects of a program (Drummond & McGuire, 2004; Gold, Russell, Siegel, & Weinstein, 1996; Muenning, 2002). Cost evaluations include: cost-benefit analysis; cost-effectiveness analysis; cost utility analysis and others. Cost evaluation findings are particularly helpful and very important when an objective of an intervention is to move from a clinical setting or efficacy study and into a real world setting. Cost evaluations can provide information about the true costs of implementing an intervention, when the timing is best to intervene, and what type of intervention is most cost effective (Foster, Dodge, & Jones, 2003; Hargreaves, Shumway, Hu, & Cuffel, 1998). Cost evaluation research can also help policy makers and funding agencies allocate funds among interventions based on the relative efficiency of the interventions, providing the “biggest bang for the buck” (Foster et al., 2003; Hargreaves et al., 1998; Muenning, 2002).

One of the guiding principles of cost-benefit analysis (CBA) is to put a monetary value on all inputs and to determine the monetary value of the effect the intervention has on the participants. Everything is translated to monetary terms in order to make direct comparisons. Costs and benefits are also adjusted for the time value of money (which changes over time) and are calculated in ‘present values’ if costs or benefits are distributed over time. This is particularly important for this study because there were six cohorts and data collection took place over three years. In a benefit cost analysis, the comparison is between the cost of doing the program and the cost of doing nothing or the status quo (Gold et al., 1996; Hargreaves et al., 1998).

Cost effectiveness analysis (CEA) and its analogue, cost-utility analysis (CUA) differ from CBA in that no monetary value is applied to the outcomes/benefits of an intervention. Cost effectiveness analysis has become more popular than CBA in the analysis of health care because of the difficulty of placing a monetary value on the health or longevity of individuals. For example, when examining mental health outcomes, clinical rating scales or some other measures could be used as the unit of measurement for the outcome (benefits). Likewise, when examining health outcomes, blood pressure or obesity would be more natural units of outcome measurement.

Using a natural unit for measurement of outcomes makes comprehension easier for decision makers because it is difficult to put a monetary value on human life. Comparisons are clearer when using tangible units as opposed to just reporting measurement in dollar amounts. However, while natural units of measurement increase interpretability, they do not translate equally across studies when different units of measurement are used for analysis. It is easier to compare dollars to dollars as opposed to decreased dropout rates with academic achievement. Cost effectiveness analysis is typically used when comparing interventions or programs that have similar outcomes (Hargreaves et al., 1998; Muenning, 2002).

The application of cost evaluation research to prevention programs. Cost evaluation of prevention programs has gained interest in the past two decades, likely due, in part, to limited funding and increased accountability. More and more policy makers, funding agencies and community organizations are interested in both how effective an intervention is in achieving its goals and also how cost efficient it is. The monetary costs of depression, conduct disorder and antisocial behavior have been the focus of several cost evaluation studies in recent history. These studies examine the societal costs of depression and antisocial behavior as well as the costs of delivering interventions to mitigate the negative effects (Cohen & Piquero, 2009; Hsis & Belfer, 2008; Lo Sasso, Rost, & Beck, 2006; Vos, Corry, Haby, Carter, & Andrews, 2005a).

For example, depression is a mental illness that affects 9.5% of the population at any given time (Melek, 2005). It is related to direct costs such as increased medical visits, hospitalizations, increased use of non-psychiatric services, and medication, as well as indirect costs, such as absenteeism from work and lower productivity; therefore, it has a large economic impact on society (Lave, Frank, Schulberg, & Kamlet, 1998; Lo Sasso et al., 2006; Rupp, 1995; Vos et al., 2005a; Vos, Haby, Magnus, Mihalopoulos, Andrews, & Carter; 2005b). It is estimated that the cost of depression is close to $44 billion in lost productivity annually (Stewart, Ricci, Chee, Hahn, & Morganstein, 2003). Health economists have examined the impact of depression in the workplace and in society as well as the cost effectiveness of depression interventions (Conti & Burton, 1994; Lave et al., 1998; Lo Sasso et al., 2006; Rupp, 1995; Vos et al., 2005a; 2005b). In studies of the cost of depression in the workplace, researchers have found that the major costs are from absenteeism and lack of productivity (Conti & Burton, 1994; Stewart et al., 2003; Melek, 2005). Comparisons of treatment plans find that anti-depression medication and cognitive behavioral therapies are the most effective treatments for long term outcomes but can be more costly in the short term than just antidepressants.

Conti and Burton (1994) found, for example, that when treatment for depressive disorders was compared with common chronic health conditions, the average length of disability and relapse rate was greater for the depressive disorders. Depressive disorders also had the greatest health insurance plan costs of all the behavioral health diagnoses and were the number one disorder reported by Employee Assistance programs (Conti & Burton, 1994).

Lave et al. (1998) compared the costs of two different standardized treatment plans (pharmatherapy and psychotherapy) for depression with the cost of being treated by a primary care doctor. They examined costs as well as quality of life outcomes and found that standardized treatments lead to better outcomes in terms of quality of life but used more resources than those used under a primary physician’s care. Similarly, Vos and colleagues (2004; 2005a; 2005b) compared the economic impact of major depression and the various treatment options in a cost effectiveness analysis. They also explored the policy implications of their findings. They found that both antidepressant drug therapy and cognitive behavioral therapy (CBT) were more effective treatments for depression, but they were also more costly initially than other treatments, such as being treated by a primary care doctor. However, when long term economic impact was assessed, the drug and behavioral therapies reduced costs associated with major depression.

Rupp (1995) studied the economic consequences of not treating depression by using the benefit cost analysis approach. She compared the cost of treatment and the cost of non-treatment on patient mortality, morbidity and medical services. She found that patient mortality was reduced in the treatment group based on the suicide rates of those with untreated affective disorders. Suicide rates would decline 70 to 90% if treated. Adequate treatment of depression reduced absenteeism by 25% and produced an 8% reduction in employee turnover in one of the companies that Rupp evaluated in her study. Finally, Rupp found that, for those who were treated for their depression, their general health care utilization was reduced by 20%. By her estimation, the economic consequences of untreated depression in the US economy, due to loss of life and reduced productivity, would be approximately $4 billion US dollars in 1995.

Benefit Cost Analysis and the FBP

The benefit cost approach was applied in this study to examine the costs and benefits of services averted at the six year mark following participation in the Family Bereavement Program. The benefit cost analysis (CBA) approach includes all costs and benefits and values them in monetary terms (Gold et al., 1996; Hargreaves et al., 1998). CBA applies monetary value to direct and indirect costs such as overhead and time donated to a project by volunteers, as well as the earnings lost by subjects whose participation in the project involves an investment of time. A monetary value can also be applied to benefits such as higher educational attainment or earning potential for those who do participate.

The benefits also include costs averted by participation in an intervention. For example, high risk youth who are identified early and participate in prevention and treatment resources are less likely to commit crimes in their adolescent and adult years than high risk youth that do not participate in prevention and intervention programs (Cohen, 1988; 1998; Cohen & Piquero, 2009). The future costs that are avoided by a high risk juvenile's participation in prevention and treatment programs have been estimated (at present value) to be from $2.6 to 5.3 million in societal costs per youth such as criminal justice costs (police, courts, prisons), victim costs, and offender loss of productivity due to incarceration (Cohen & Piquero, 2009).

This study extends a prior study that examined the costs and benefits of delivering the FBP Intervention (Foster, Porter et al., 2007). In the prior study, the costs per family and costs per individual were calculated for those who participated in the original intervention and costs were estimated for a natural 'real world' setting as opposed to the research setting in which the intervention took place. Comprehensive budget spreadsheets were used to determine specific inputs related to intervention costs. By examining the budgets from that time period, researchers were able to delineate costs that were related to research and costs that were related to the intervention. Only expenditures related to delivering the intervention were included in the calculations. direct and indirect costs were also estimated and included in the calculations. Intervention costs were calculated on three levels; per family, per person and per hour of contact as well as from two different perspectives: from that of the agency and from that of society (see Foster, Porter et al., 2007 for specific costs). The present study extends the Foster, Porter et al. (2007) study by thoroughly examining the costs averted (benefits) by participation in the FBP intervention, monetizing those benefits, and applying the benefits to the cost of the intervention. This study contributes to the literature base by examining the extent to which a family bereavement prevention program can save society money as well as ameliorate poor outcomes. Results from this study will help inform policy makers and funding agencies about the best allocation of scarce resources toward programs that are efficacious and cost effective.

Key concepts in applying cost evaluation research to the FBP*.* There are several terms that should be defined to facilitate a clearer understanding of the evaluation process. Costs will be defined, which include direct and indirect costs and opportunity costs.. Next, a definition of private versus societal perspectives will be given and why it is important to clearly identify the perspective taken in the analysis. And finally, a definition of transfer payments and household productivity will be given.

Direct costs are those costs that can be clearly attributed to providing a service, treatment or some assistance (Hargreaves et al., 1998). The Foster, Porter et al. (2007) study of the FBP examined the direct costs of the FBP intervention which included calculation of clinician’s services, crisis services and travel expenses. This study’s direct costs included mental and behavioral health service costs and prescribed medication. Indirect costs are losses of productivity and involve a value of time that could have been used on other activities (Hargreaves et al., 1998).

Perspective in cost evaluations is critical to establish in the beginning of a study and is chosen based on the objectives of the study (Johnson, 2005). The study perspective can be from either a private or social viewpoint. A private perspective involves examining costs from the view of the individual, family, agency, or organization and is used mostly when comparing similar programs (Hargreaves et al., 1998; Johnson, 2005; Muenning, 2002) A social perspective on the other hand involves examining costs from the point of view of society at large and includes all the costs and benefits experienced by all segments of society regardless of who pays or receives them (Fox-Rushby & Cairns, 2005; Drummond & McGuire, 2005; Johnson, 2005).

Two additional cost terms are not evaluated in this paper. Transfer payments are defined as a resource taken from one source and given to another but no resource is used up; it is a redistribution of resources (Fox-Rushby & Cairns, 2005; Hargreaves et al., 1998). Transfer payments are not true costs because they are not the creation or consumption of a resource. For example, social security payments and welfare payments are both transfer payments. Transfer payments are not applicable in this study. Finally, we should define household production which is the production of goods and services by household members, using their own unpaid labor, capital and for their own consumption (Ironmonger, 2001). Household production is typically assessed in cost evaluations however, due to the age of the participants in the FBP study, it does not apply.

Steps in applying cost evaluation research to the FBP. There has been an increased interest in conducting cost evaluation research in prevention science (Knapp, 1997; Olds, Henderson, Phelps, Kitzman, & Hanks, 1993; Reynolds, Temple, Robertson, & Mann, 2002). Unfortunately there has not been uniformity in how cost evaluation research should be conducted (Foster, Porter et al., 2007; Wolff, Helminiak, & Tebes, 1997; Wolff, 1998). However, a number of the strongest cost evaluations in the prevention science studies have some of the same elements. These elements are drawn from health services research and can provide a general framework for estimating costs (Haddix, Teutsch, & Corso, 2003, Foster, Porter et al., 2007; Gold et al., 1996; Herman, Avery, Schemp, & Walsh, 2009; Johnson, 2005; Sloan, 1995; Wolff et al., 1997; Wolff, 1998). For this study the following steps will be used as guidelines. They are: 1) select the perspective, 2) define the intervention, 3) identify and measure the relevant outcomes/costs of the intervention, and 4) account for uncertainties (sensitivity analysis).

Step 1: Select the perspective. The perspective of the cost evaluation refers to the viewpoint of the study—that is who bears the costs and who receives the benefits? One must consider whether they are the same entity. The individual or private perspective only includes the costs and benefits that pertain to the individual. The widest perspective, the societal view, includes all costs and benefits regardless of their distribution among individuals within a society. The other private perspectives include family, community and funding agencies. In evaluations of interventions, the most common perspective is from a societal view which encompasses all the other perspectives and includes all costs of the program (Gold et al., 1996). The societal perspective is considered the gold standard for cost evaluation analysis and is the perspective this study used to examine mental and behavioral service and prescription drug use that have both economic and psychosocial impact on society (Hargreaves et al., 1998).

Step 2: Define the intervention. The next step is to clearly define the preventive intervention to be evaluated. This means that one must estimate the costs of the intervention as it was delivered, not as it will be delivered, in a community setting. These costs include direct costs, or those costs that are directly related to the intervention, and indirect costs, or those costs that stem from the intervention but are not incurred by the intervention. Direct costs include salaries, overhead, and cost of training; indirect costs include the value of time the participants spend in the program and the value of time spent traveling to and from the program. The benefits are the savings obtained by reducing the need for mental and behavioral services and prescription drugs. In other words, the benefits are measured as the reduction in potential costs of future services.

Step 3: Identify and measure the relevant outcome and costs of the intervention*.* A third step in the evaluation is to identify the effects of the intervention for all health and non-health outcomes and classify them as either costs or benefits. Outcomes are determined by the goals of the study. For example, in the cost evaluation of the High/Scope Perry Preschool program (Barnett, 1993), the investigators followed the participants for 40 years after preschool to examine the effects that preschool had on their lives. Because the investigators were looking at effects of the intervention, they applied monetary values to high school graduation, employment and income as well on interaction with the justice system and dependence on welfare of both the intervention group and the control group. Graduation rate, type of employment and higher income were benefits, whereas interaction with the justice system and dependence on welfare were costs.

The effects that are to be evaluated depend on the goals of the intervention. Using the FBP intervention as an example, one of the goals of the intervention was to improve mental health problems. Therefore, in this study we examined mental and behavioral health outcomes and the costs associated with the use of services to address these outcomes.

After identifying the relevant outcomes, it is important to examine the costs or inputs of the intervention as well as to identify the data sources from which these costs are drawn. For instance, project budgets are an excellent data source to start the evaluation. Budgets can give tangible direct and direct costs; however, if the perspective is societal, then the evaluation must go further than just budgets because budgets do not take into account intangible and indirect costs. Other inputs such as volunteer time, participant time, and travel to and from the intervention, opportunity and quality of life costs are a few of the non-tangible costs that should be considered. In the current study, inputs included service data collected from mental and behavioral health agencies, emergency rooms, inpatient and outpatient clinics, private therapy, and pharmacological data from pharmacies.

Step 4: Account for uncertainties (Sensitivity analysis). Conducting sensitivity analysis is the final step in cost evaluation analysis. Monetarily valuing costs and benefits in preventative interventions is not precise and involves subjective estimation of some costs and benefits therefore it is critical to test those assumptions with other values. In sensitivity analysis, one lists all the assumptions that the values of the variables were based upon and compares the impact of slightly different assumptions on the final results. If small changes in assumptions do not significantly affect the results, one can be confident in the original results of the benefit cost analysis.

In the prior benefit cost study of the overall costs of the FBP intervention (Foster, Porter et al., 2007) the distribution of the project director’s time was used to determine percentages of intervention versus research time. A sample was taken from actual time sheets of the director's time in the beginning of the project to calculate the intervention to research ratio and this ratio was applied throughout the study to several important inputs. However, toward the end of the intervention (due to more efficiency that can come with time) this ratio may be too high. To test this, we conducted sensitivity analysis by reducing the intervention costs by 10%, which resulted in a very small effect overall (Foster, Porter et al., 2007). Therefore, there was confidence in the original values used to conduct the benefit cost analysis of the FBP intervention.

Summary of the Present Study

By applying monetary value to the costs of this program in Foster, Porter et al., (2007) the total costs expended to deliver the intervention were examined and it was determined that the FBP was cost beneficial when delivered in clinical settings. The current study expanded on the 2007 cost evaluation study by examining long term benefits of the FBP intervention in the form of avoidance of potentially costly events to individuals and to society, namely mental and behavioral health services utilization and prescription drug use. This study compared the Literature Control group and the FBP group on: (a) number of participants using mental/behavioral health services and prescription drugs for over one year at the sixth year follow up (b) the frequency of mental/behavioral health services and prescription drug use for a duration of over one year at the sixth year follow up, and (c) the costs of mental/behavioral health services and drug use at the sixth year follow up. Finally, the primary goal was to (d) calculate the benefits of the FBP by examining the costs averted by participation in the intervention (benefits) and apply those benefits to the cost of the intervention using data collected at the sixth year follow up. It was hypothesized that fewer youth and caregivers in the FBP group would use mental/behavioral services and prescription drugs as compared to the LC group at the sixth year follow up. It was also hypothesized that the youth and caregivers in the FBP group would use fewer services overall than the LC group at the sixth year follow up. Additionally, the cost of the mental and behavioral health and prescription drug services used by the LC group was expected to be greater than the costs of those types of services for the FBP group. Finally, it was expected that the costs averted by the FBP groups’ use of fewer services for mental or behavioral health reasons (the difference between the LC group costs and the FBP group costs) when applied to the cost of the intervention would show that the FBP intervention would cost society less in terms of mental health costs overall, and that the program would be cost beneficial to deliver (Foster, Porter et al., 2007).

METHOD

This next section will describe recruitment into the FBP intervention, the characteristics of these participants, and the intervention procedures. Next, the 6 year follow-up study will be described, along with characteristics of these participants. Finally, measures used for the current cost evaluation study and analytic plan will be outlined.

Participants in the FBP Intervention

The participants were recruited from a variety of sources in a southwestern metropolitan area, including newspaper articles, presentations to agencies or organizations who work with bereaved children (i.e., churches, hospices, and schools), media presentations, and mail solicitation. Participants were recruited to take part in a 12-week intervention program for families in which a caregiver had died within the past year. The largest referral source was schools, referring 52% of the recruited families. All referrals were initially screened for eligibility by phone, and those who were eligible were invited to participate in an in-home visit, which involved further screening. The initial eligibility criteria for family participation were: (a) the death of a biological parent or parent figure (parent figure was defined as any person who assumed a parenting role for 2 years prior the death), (b) the death occurred no longer than 30 months and no earlier than 4 months prior to the start of the program, (c) at least one child and the caregiver (caregiver refers to the surviving parent or parental figure who assumed the role of parenting since the death), (d) there was at least one child between the ages of 8 and 16, (e) neither caregiver nor child were currently receiving other bereavement or mental health services, (f) both the caregiver and child could complete the assessment battery in English, (g) children were not in special education classes for the mentally handicapped, and (f) the family was not planning on moving in the next 6 months.

A total of 432 families met the initial eligibility requirements. Of these, 238 (56.0%) agreed to participate in the home visit, at which they were screened for additional exclusionary criteria. If the child or caregiver expressed suicidal intent or if the caregiver had a current diagnosis of depression, as assessed by the Structured Clinical Interview for DSM-IV module for major depressive episode (First, Spitzer, Gibbon, & William, 1996), they were referred for mental health treatment services and excluded from this study. Children were not screened for depression because the intervention program was intended to affect change in internalizing problems. Children were, however, screened for attention deficit disorder (that was not being treated with medication), conduct disorder, and oppositional defiant disorder using the Diagnostic Interview Schedule for Children - Child Informant (National Institute of Mental Health, 1992a) or the Diagnostic Interview Schedule for Children - Parent Informant (National Institute of Mental Health, 1992b). Because of potential problems with group compliance, children who met diagnostic criteria for the above mentioned disorders, were excluded from this study and referred to clinical services.

Of the 238 families participating in the home visit, 20 (8.4%) were referred for clinical services, and 15 (6.3%) were determined to be ineligible after the home visit for miscellaneous reasons such as unavailability in schedules, unwillingness to be randomized, or plans to move out of the area. The 203 remaining families were invited to participate in the intervention study. Forty-seven (19.7%) did not complete the pretest or refused to participate. The remaining 156 families were randomly assigned by a computer program to one of two conditions: the 12-week intervention program or a self-study bibliotherapy program. Ninety families (135 children) were assigned to the Family Bereavement Program (FBP) and 66 (109 children) families were assigned to the reading program. For families who had multiple children between the ages of 8 and 16, one child was randomly designated the target child.

***Sample characteristics*.** The FBP intervention sample consisted of 21% father-headed households; 63% were mother-headed households, and the remaining 16% of households were headed by a nonparental family member or a friend. Median household income was in the range of $30,001 to $35,000. Parental death occurred an average of 10.81 months prior to the program and the causes of death were: 67% illness, 20% accident, and 13% suicide or homicide. Forty six percent of the children were female. Mean age of the children was 11.39 years (range: 8-16, *SD* = 2.43). Ethnicity of the children was as follows: 67% were non-Hispanic White, 16% were Hispanic, 7% were African American, 3% were Native American, 1% were Asian or Pacific Islanders, 6% were other.

FBP Intervention Procedures

The Family Bereavement Program (FBP) was designed based on a theory of cumulative protection, which suggests that multiple protective factors improve child outcomes. By improving multiple family and individual level risk and protective factors for bereaved children, the program theoretically should lead to improvements in mental health outcomes for children (Wyman, Sandler, Wolchik, & Nelson, 2000). The FBP uses the ‘small theory’ approach (Lipsey, 1990) to identify potentially modifiable processes that are associated with the development of problems. This approach uses previous empirical research to develop a ‘small theory’ of how children’s adjustment problems can be changed or prevented. In this case, potentially modifiable factors were thought to be family level variables and individual level variables. The FBP intervention targeted four family level variables: children’s exposure to stressful events, mental health of the caregiver, effective discipline and the positive quality of the caregiver-child relationship (Tein, Sandler, Ayers, & Wolchik; 2006). Several individual level variables were also targeted: self-esteem and adaptive beliefs, positive coping, and negative thoughts about stressors (Sandler et al., 2003).

Between spring of 1996 and December of 1999, the intervention was delivered to 6 successive cohorts ranging in size from 21 to 36 families. Family members were put into separate groups for caregivers, children, and adolescents. For families assigned to the FBP condition, children who were between 8 and 11 years old were always placed in the child group, and those who were between 13 and 16 years old were placed in the adolescent group. The 12-year-olds were randomly assigned to either the child or the adolescent groups. Of the 135 children assigned to the FBP, 70 children were placed in the child group and 60 were placed in the adolescent group. Siblings were split up in different groups whenever possible. Each group consisted of 5 to 9 members (caregiver groups, *M* = 8.08, *SD* = 1.11; child groups, *M* = 6.91, *SD* = 1.04; adolescent groups *M* = 7.00, *SD* = 1.50).

Master’s level or equivalently experienced clinicians (group leaders) led the groups. The groups were co-led by 2 group leaders who went through 40 hours of training prior to the start of the program. In addition, during the implementation of the intervention, group leaders received 2 hours of training per week and responded to weekly quizzes on the material of that week’s session. Weekly sessions were followed by supervision (1.5 hours) to address special issues that the group may have experienced or issues that the group leaders may have had.

Each group participated in 12 weekly group sessions that lasted 2 hours each. Four of these sessions had activities for both caregiver and child to participate in together. There were also two individual family sessions that were held to review and plan the family’s use of the program skills. The program used active and collaborative learning techniques to create a sense of personal efficacy and group support (Kagan, 1992). Opportunities were provided in each session to share experiences with use of program skills to get help to use skills more effectively.

The child and caregiver sessions were related in content. In the caregiver group, the goals were: to improve positive interactions between caregiver and child, to use effective discipline (Wolchik et al., 2000), to prevent adult depression, to teach skills to increase positive activities, and to challenge negative thoughts (Lewinsohn, Munoz, Youngren, & Zeiss, 1992). Caregivers were also taught to help their children in the use of problem-solving to reduce their exposure to negative events and to cope with negative thoughts.

The child and adolescent groups used techniques to improve child and caregiver relationships (Wolchik et al., 2000). While not exactly the same in both groups, the same skill domains were present in both the child and adolescent groups but were developmentally appropriate for the ages. For instance, when learning problem solving, the child group created plays using puppets to demonstrate the skills, whereas the adolescent group learned this skill by creating real life scenarios and discussing the steps needed to solve the problems. The FBP intervention focused on helping distinguish controllable from uncontrollable events (Lohnes & Kalter, 1994), improving problem solving skills (Weissberg, Caplan, & Bennetto, 1988), and improving coping efficacy, self-esteem, and positive coping (Meichenbaum, 1986). The FBP intervention also focused on improving children's control-related beliefs and on cognitive reframing for stressful events (Meichenbaum, 1986). There also were opportunities for the children and adolescents to express their grief, to receive validation of grief-related feelings through group discussions, and to learn how to share their feelings with their caregivers. To improve coping efficacy, children also chose individual goals to work on in the program.

The weekly sessions were held in the evening, and program staff provided dinner for the participants before they broke in to their respective groups. Each group followed the same format and structure. The first 20-30 minutes involved discussions about grief; each discussion focused on specific, common feelings that the bereaved child or adolescent may experience. The topic was different from week to week. This was followed by a group activity that gave each child or adolescent a chance to share their experiences related to the topic of the day. After the group activity there was a discussion about the topic. Finally, after every group, participants were assigned homework, which involved practicing the skill that had been learned that session. The homework was turned in at the beginning of the next session and discussed to determine if there were any issues related to practicing the skill.

In the self-study bibliotherapy group (Literature control), caregivers, children and adolescents were given books at 1 month intervals that related to adult, child and adolescent grief. Each book was accompanied by a syllabus that outlined the major topics covered in the books. Each of these groups received three books in total.

Assessment interviews were conducted at pretest, posttest and 11-month follow-up. Interviews were conducted in the families' homes, with the caregiver and children interviewed individually by trained interviewers. Confidentiality was explained, and caregivers were given informed consent forms to sign. Children signed assent forms. Families were paid $40 for an interview that included 1 child and $30 for each additional child who participated. Caregivers were asked questions about their mental and physical health, substance use, and parenting behaviors and beliefs. Caregivers were also asked questions about their children's internalizing and externalizing behaviors. Children were asked questions about their own mental health, questions about internalizing and externalizing behaviors and their perceptions of their parents' parenting behaviors.

Family Bereavement Program Follow-up Study

Six years later, in the spring of 2002, the FBP research team began a follow-up study to examine how the preventive intervention for bereaved families affected behavioral and mental health problems in adolescence and young adulthood. This follow-up study forms the basis for the present research.

Participants

The research team kept in contact with the FBP participants after the intervention ended by sending postcards, yearly newsletters, and birthday cards as well as by making bi-yearly tracking phone calls. The newsletter and postcard that were sent in the year prior to the 6-year follow up study informed participants that we would be contacting them to invite them to participate again in the study. Recruitment calls were made and interviews were scheduled.

The Arizona State University Institutional Review Board approved the study. Participants who were 18 years and older signed consent forms, those younger than 18 years signed assent forms before interviews took place. Interviewers conducted two 2 1/2 hour in-home computerized assessments for each family member. Participants were paid $50 per session.

At this follow up, interviews with 208 youth and 143 caregivers from 140 families were conducted. Because caregivers of 9 youth, who were not interviewed, reported on the missing youth, data on 218 youth were available (102 youth from 62 families in the Literature Control (LC) group and 116 youth from the families in the FBP group). Of the youth, 54% were males, and the average age was 17.6 years. The ethnic breakdown was as follows: 67.7% white, non-Hispanic; 14.3% Hispanic; 6.4% African American; 3.7 % Native American; 1.4% Asian/Pacific Islander; and 6.4% other. Seventy-eight percent of the caregivers were female and the average age of the caregivers was 47.79. Parental death occurred with a mean of 10.81 months prior to the baseline assessment. There were no significant differences in the rate of follow up between the FBP group and Literature Control (LC) group (Sandler, Ayers, Tein, et al., 2010). Not all participants in the 6 year follow up study responded to questions related to their own or their child's mental and behavioral service use, thus this benefit cost study had fewer participants than the full follow up study. There were data for 212 youth (101 females, 112 in the FBP group) and 135 caregivers (106 females, 75 in the FBP group). Unless differentiation is needed, youth will refer to both the young adults and adolescents.

Assessment of Service Usage

Procedures. For the current study, youth's reports of their mental and behavioral health service use and prescription drug use for the past 6 years and past year were collected. The past year data represent a one-year window of service and prescription drug usage at the six-year follow up. Specifically, young adults (18 or older) were asked about their service use in all service categories because the FBP team thought that they would be more accurate reporters of their own services and frequency of visits than their caregivers. Adolescents, however, were only asked about their use of doctor, counselor, school counselor and spiritual advisor services because the FBP team thought that caregivers would be are more accurate reporters of their children's service use and frequency of visits.

Caregivers' reports of their own use of mental and behavioral health services, including prescription drug use, and caregivers' reports of their youth's (young adult and adolescent) mental and behavioral health service use and prescription drugs for the past six years and the past year were also used. Caregiver's report of adolescent's service use was combined with adolescent self-report of service use to create variables that insured all data in each service categories were captured for the adolescent. Next, young adult's reports of service use and the caregiver/adolescent reports of adolescent service use were combined and reported as youth. Caregivers' self-reports and youth reports were used in analyses.

Measures. The FBP Service Utilization measure was based on an adapted version of the Services Assessment for Children and Adolescents (SACA; Hoagwood et al., 2000; Horowitz et al., 2001; Stiffman et al., 2000). The

SACA was developed out of the need for an accurate method of assessing mental health services for youth and adolescents and is administered to both caregivers and youth regarding the youth’s use of services. It assesses services in three broad settings; residential, outpatient and school. Stiffman et al., (2000) found that the SACA caregiver and youth reported agreement on whether or not any services had been used during the youth’s lifetime (κ = .57) and the past year (κ = .63) was high and that the SACA had better parent youth correspondence than any other service use measure in the literature. Additionally, Hoagwood et al., (2000) found that the concordance between parent reports of children’s mental health services and medical health records was high (κ = .76) on an ‘any use’ variable and kappas were between .50 and .67 when service type was broken down by category. The SACA also has good test retest reliability for both lifetime service use and previous year service use (12 months) for reports from both parents and children aged 11 or older (Horowitz et al. 2000).

The differences between the original SACA and the FBP version are that the SACA asks specific questions about costs, treatment goals and dosage data from the parents: the FBP version does not ask for costs or treatment goals from any of the respondents. The SACA also asks for lifetime and past year services, whereas the FBP version asks for services in the past 6 years and the past year. For this study, endorsement of services in the past 6 years was analyzed as part of the preliminary analyses but because they did not differentiate between physical and mental health problems, they were not included in the results section of this study. See Appendix A for these 6 year service use results. The past year services, representing a one-year window at the six-year follow-up, were analyzed and used in the cost analyses.

Participants were asked about their service use in the following categories: doctor visits, emergency room/urgent care, counseling, school counseling, spiritual advising, special education, day treatment (outpatient treatment for emotional/behavioral or substance use problems), inpatient hospital/other inpatient treatment, foster care, medication for mental/behavioral health, juvenile justice, support groups and seeing mediums (someone who communicates with the dead). However, for this study, only mental or behavioral health related categories of services were used (doctor visits, emergency room/urgent care, counseling, school counseling, spiritual advising, day treatment, inpatient hospital/other inpatient treatment, and medication for mental/behavioral health). If services were positively endorsed for 6 years, participants were asked about past year service use. For each service that was endorsed for the past year, follow up questions were asked regarding specifics about the service (who, where and the reason for the service), as well as the number of visits or dosage (prescribed medication). Sample items include "In the past six years have you seen a counselor, therapist, psychologist, psychiatrist, social worker, or other mental health professionals for treatment for mental health, behavior, attention, drug, or alcohol problems you may have been having?" If the answer was "Yes", the next item was "Did you receive this type of treatment or care in the past year?" If the answer was "Yes", the follow up questions to this response were: "Who was the doctor?", "What is his/her address?", "In the past 12 months , how many times have you been to see him/her?" and "How many of these visits, if any, were related to mental health, behavior, drug, or alcohol problems? This refers to visits that were caused in some way by drinking, drug use, behavior or emotional problems". If the participant endorsed more than one doctor, these questions were asked for each reported professional. Only endorsement of services for the past year was followed up with questions about the specifics of those services.

New variables for total frequency of visits within each service category in the past year were also created for youth and caregivers. To do this, the numbers of visits within each service category were summed. This was done to calculate frequency of visits counts by youth and caregiver within each service.

Assessment of Costs

Procedures. Participants were asked to supply authorization for the FBP team to request records for their reported services. All authorization forms to request records were compliant with the Health Insurance Portability and Accountability Act (HIPAA) due to the privacy laws. FBP researchers contacted the service providers and requested diagnostic codes, number of visits, costs related to the visits, and prescription information. For 78% of the cases (participant reports of service) we were able to retrieve records related to the service.

Of the records received, almost all contained frequency of visits and most contained diagnostic codes where applicable. However, nearly half of the records collected from service providers did not include actual cost or billing data. Efforts were made by the FBP team to retrieve billing data whenever possible by calling billing departments, following up with the providers and resending requests for records. The billing records that were received did not have uniform data. All billing records included overall charges but some also included insurance payments and copays by the participant. To make cost estimates for billing data not received from service providers, the following protocols were followed.

Fee schedules from Medicaid for doctor and counseling visits, day treatment and overnight inpatient treatment were used. Arizona's Medicaid program is administered by the Arizona Health Care Cost Containment System (AHCCCS). Current Procedural Terminology (CPT) codes were entered into the AHCCCS Physicians Fee Schedule website for each service to determine a per visit rate. Local mental and behavioral agencies and hospitals were consulted to obtain the correct CPT codes and to confirm per visit fees after fee data was collected. Doctor visits were based on a 15-20 minute appointment with low to moderate complexity, counseling visits were based on 45-50 minute psychotherapy insight oriented, behavior modifying and/or supportive sessions in an office or outpatient facility. Day treatment costs were calculated based on a combination of hourly rates for psychotherapy and for group therapy. Overnight treatment costs were based on the Medicaid/AHCCSS costs for treatment per day in an inpatient facility. Per visit cost information for school counselors was calculated by finding the average salary and hourly wage for school counselors in Arizona (Bureau of Labor Statistics, 2011a). The average visit with a school counselor is 30 minutes. Emergency room costs were based on a 2008 national average (Medical Expenditure Panel Survey (MEPS), 2008) and confirmed by local mental and behavioral health hospitals. Prescription drug cost was calculated using Average Wholesale Price (AWP) from the 2003 Red Book Drug Reference. Spiritual advisor costs per visit were not calculated in this study because it is difficult to monetize this type of service. Costs estimates were made based on Arizona fees for service. Of the 156 families in the original intervention, less than 10% were living out of state at the time of the 6 year follow up study. Out of the families in the current study, only 3 families lived out of state.

All costs that were not based on 2011 estimates (records from agencies and service providers, ER rates) were converted to present day value using a 5% rate (Bureau of Labor Statistics (BLS), 2011b; 2011c; Viscusi, 1995).

Due to variability and sparseness in billing data received from service providers, we made the decision to base the primary benefit cost analysis using AHCCCS estimates for all doctor, counselor, day treatment and inpatient treatment visits and based the prescription drug usage on the 2003 AWP. Because duration of prescription drug use was not asked in the battery, estimates were made using 30 days, 90 days and 180 days. Additionally, a benefit cost model using a combination of AHCCCS and real costs from billing records and a benefit cost model using estimated costs from billing records were calculated for the sensitivity analysis. To obtain total costs per service category, the number of visits within each service category was multiplied by the aforementioned AHCCCS, MEPS, BLS or AWP estimated fees.

RESULTS

The preliminary goals of the current study were to compare the LC and FBP Intervention groups at the six year follow-up on: (a) number of participants using mental/behavioral health services and prescription drugs, (b) the frequency of use of mental/behavioral health services and prescription drugs, and (c) the costs of mental/behavioral health services and prescription drugs. The final, and primary goal, was to (d) calculate the benefits of the FBP by analyzing the monetary difference between the LC and FBP groups in terms of cost of services used and then apply those benefits to the cost of the intervention.

It was hypothesized that that fewer youth and caregivers in the FBP group would use mental/behavioral services and prescription drugs as compared to the LC group. It was also hypothesized that the youth and caregivers in the FBP group would use fewer services overall than the LC group. Additionally, the cost of the mental and behavioral health and prescription drug services used by the LC group was expected to be greater than the costs of those types of services for the FBP group. Finally it was expected that the costs averted by the FBP groups' use of fewer services for mental or behavioral health reasons (the difference between the LC group costs and the FBP group costs) when applied to the cost of the intervention would show that the FBP intervention would cost society less in terms of mental health costs overall and that the program would be cost beneficial to deliver (Foster, Porter et al., 2007).

Descriptive Statistics for Service Utilization

Number of participants using services for past year. As shown in Table 1, more youth in the LC group reported using five of the eight services in the past year than did youth in the FBP group. Specifically, more youth in the LC group used doctor, emergency room, counselor, day treatment and inpatient/other inpatient services in the last year than youth in the FBP group. However, more FBP youth reported using school counselors and spiritual advisors and prescription drug use than did those in the LC group. The data for LC caregivers shows followed a similar pattern as those for LC youth. More LC caregivers reported using doctors, counselors, day treatment, and inpatient treatment and prescription drugs as compared to the FBP caregivers (Table2). However, more FBP caregivers reported using school counselors than LC caregivers. Neither group reported using spiritual advisors or ER visits.

Frequency of service use for past year. Tables 3 and 4 display the frequency of service use by youth and caregivers. The LC youth group had more emergency room, day treatment, and inpatient/other inpatient treatment services use than the FBP youth group (Table 5). Interestingly, the FBP youth group had more visits to doctors, counselors, school counselors, spiritual advisors and prescription drug use than the LC youth group. A different pattern for the LC caregivers was evident (Table 6). The LC caregivers had more frequent visits than the FBP caregivers in all service categories and use of prescription drugs except visits to school counselors. Neither group reported use of spiritual advisors or emergency room services.

Calculation of geometric means. Arithmetic means do not describe the data well due to the low base rates in many of the service categories as well as the highly skewed nature of the data. Geometric means present a clearer picture of the data because they tend to dampen the effect of very high or very low values (Spizman & Weinstein, 2008). To calculate the geometric mean, the numbers are multiplied and the nth root (where n is the count of the numbers in the set) is calculated. Tables 5 and 6 display the geometric means for the frequency of service use over the past year by youth and caregivers. The LC youth have higher mean averages than the FBP youth in all categories with the exception of doctor visits and spiritual advisor visits (Table 5). The LC caregiver group had higher mean averages than the FBP caregivers in day treatment visits, inpatient visits and prescription drug use. FBP caregivers were higher in doctor visits, counselor visits and school counselor visits. Neither group reported any visits to the ER or visits to spiritual advisors so geometric means could not be calculated (Table 6).

Testing of Intervention Group Differences in Service Utilization

The FBP intervention and the service-use outcomes have several properties that make the use of OLS regression to examine group differences inappropriate. First, the FBP intervention was applied to families rather than individuals; each family includes 1 or more caregivers and 1 to 5 youth. Youth from the same family will be more similar to one another than to youth from other families; this violates OLS regression assumption of independence (Cohen, Cohen, West, & Aiken, 2003). Multi-level models or hierarchical linear models (Raudenbush & Bryk, 2002) can correctly account for this lack of independence.

Second, the outcomes of interest in this study included both binary variables (e.g., Have you seen a doctor in the past year?) and count variables (e.g., How many times have you been to see the doctor in the last year?). Because the outcomes are categorical the residuals for an OLS regression model have non-constant variance and are not normally distributed; and these properties violate several assumptions of OLS regression (Cohen et al., 2003). Alternative models to OLS regression that can correctly account for the properties of these types of outcomes belong to the family of generalized linear models (GLiMs; McCullagh & Nelder, 1999); the GLiM for binary outcomes is logistic regression and the GLiM for count outcomes is Poisson regression (Coxe, West, & Aiken, 2009). In order to correctly account for the categorical nature of the outcomes and the non-independence of observations, multi-level models in conjunction with GLiMs were used. For the binary outcomes, multi-level logistic regression models were used. For the count outcomes, multi-level Poisson regression models were used. Mplus Version 5.0 (Muthen & Muthen, 1998 – 2007) was used for these analyses. Missing data were handled using full information maximum likelihood (FIML) estimation using Mplus Version 5.0 (Muthen & Muthen, 1998 – 2007). This technique yields estimates that are less biased than other methods such as mean substitution or listwise deletion (Collins, Schafer, & Kam, 2001; Schafer & Graham, 2002).

Due to the relatively small sample size of 212 youth in 135 families and the complex analyses required to correctly analyze the binary and count outcome regressions, these next analyses were only run on the youth. The caregiver data (*n*=135) was deemed too small to successfully conduct regressions especially given the large number of models that did not converge in the larger youth sample.

Potential covariates analyses. Prior to conducting the multilevel models, a number of variables, measured at baseline, were tested as possible covariates of the service use outcomes. The goal was to determine what variables at baseline were related to service use for both the youth and the caregiver at the six year follow up. Fourteen potential covariates that could be related to service use after the intervention were examined. These variables were: demographic variables (child gender, child age, time since the death, group {LC or FBP}, yearly income since the death, income in the past year, change in the income since death, caregiver education level, deceased education level), post-death mental health assistance variables (caregiver reported taking youth for professional assistance to adjust to the death, caregiver reported seeking professional assistance to adjust to the death), and pre-death mental health assistance variables (caregiver saw a mental health professional prior to the death, deceased saw a mental health professional, number of different sources of mental health services used by the caregiver). These 14 variables were initially included as predictors in logistic multilevel regression models and Poisson regression analysis models using composite variables representing the number of participants using any service or frequency of use of any type of service. The composite variables were calculated by summing together the number of participants who reported using services across all service categories for 6 years and for past year for youth. None of the models converged due to the large number of covariates and the small sample size and small cell size.

In order to reduce the number of covariates, correlation analysis was conducted between the 14 potential covariates (Table 7). Based on high correlations and conceptual similarities between the covariates, the number of covariates were reduced to 8. Variables were combined and/or excluded in the following ways. Yearly income since death and number of different sources of mental health services used by the caregiver were dropped from the analyses due to overlap with other covariates (the three measures of income were highly correlated and number sources of mental health services overlapped with caregiver seeing a mental health professional). The variables indicating that the caregiver reported taking child for professional assistance to adjust the to death and that the caregiver reported seeking professional assistance to adjust to the death were combined into a single variable indicating that anyone in the family sought professional assistance to adjust to the death. The variables indicating that the caregiver saw a mental health professional prior to the death and that the deceased was treated for emotional problems were combined into a single variable indicating that either parent sought treatment for mental health problems prior to the death. The maximum of the caregiver education level and the deceased education level was used to represent maximum household education level.

Next, correlation analysis was conducted using the 8 covariates with the frequency variables (number of visits in the past year) in each service category (number of visits to the doctor, number of visits to the ER, number of visits to a counselor, etc.). Analysis was conducted on the youth and caregiver variables. In the analysis of youth outcomes, significant correlations between the individual service outcome variables were related to baseline variables in the following ways: total mental health ER visits was positively correlated with caregiver or deceased seeing a mental health professional, seeing a school counselor was negatively related to child age, income in past year and to caregiver/deceased maximum education level, and prescription drug use was positively related to months since death (see Table 8). In the analysis of caregiver outcomes, number of services used by the caregiver in the past year was positively correlated with all frequency service variables except ER visits and spiritual advisor visits. Correlations could not be calculated on ER and spiritual advisor visit sparse or no data reported. Number of services in the past year was also positively correlated with child gender. Significant correlations between baseline variables and service use variables were as follows: doctor mental health visits were positively related to child gender and prescription drug use was related to whether the caregiver or deceased were treated for mental health problems. These 8 covariates were included in multi-level logistic and Poisson regression analyses using group (LC or FBP condition) as the predictor of service use in the past year (Table 9).

Services predicted by group. To determine if group predicted the number of participants who used services in the past year multilevel logistic regression analyses was used. Separate analyses were run for each service variable. Variables for the number of participants who used each service were categorical (Have you seen a counselor in the past year? Have you seen a spiritual advisor in the past year) and were entered into the equation after the predictor (group) and the covariates (child gender, child age, time since the death, income in the past year, change in income since the death, anyone in the family sought professional assistance to adjust to the death, either parent had mental health problems prior to the death, and maximum household education level). Table 10 shows the results of these analyses. A significant group difference in doctor visits was observed. That is, more FBP youth were likely to report seeing a doctor for mental health reasons than LC youth. Day treatment services also had significant group differences. More LC youth endorsed spending time in day treatment and other inpatient treatment than the FBP youth.

In the Poisson regression analyses, to determine if group predicted the frequency of service use within service categories, group was entered as the predictor, as were the aforementioned 8 covariates. Separate analyses were run for each service variable. Only youth doctor visits and school counselor visits had significant group differences. FBP youth were likely to have more visits to doctors and to school counselors than LC youth. Models predicting emergency room visits, spiritual advisor visits, day treatment and inpatient treatment did not converge and did not produce results. This was due to small sample size and/or no services reported in that category (FBP youth had no day treatment visits or other inpatient visits), see Table 11.

Because many of the analyses did not converge due to small sample size, for the next set of analyses the number of covariates was reduced to only include the three covariates that the FBP research team has consistently used in analyses (Sandler, Ayers et al., 2010; Sandler, Ma et al., 2010) youth age, youth gender and time since death. These covariates were included in the multi-level logistic and Poisson regression analyses.

Youth age, youth gender and time since death were entered with group to predict the number of participants using services in the past year using logistic regression analysis. The results from these models showed a similar pattern as the analyses using eight covariates: more FBP youth visited doctors than LC youth. More LC youth spent more days in day treatment and other inpatient treatment than FBP youth, (see Table 12).

Using Poisson regression analyses to examine service frequency in each service category (outcome variable), entering group as the predictor and youth age, youth gender and time as covariates, only doctor visits showed significant group differences. FBP youth visited doctors more frequently than LC youth, (see

Table 13). The outcomes that did not produce any results are due to such data sparseness and small sample size (see Tables 1 and 3).

Summary of Results for Preliminary Analyses

Results from the multi-level logistic and Poisson regression models examining group differences were similar using both the eight covariate models and the three covariate models. In both models, when examining number of participants using specific services, more FBP youth visited the doctor than LC youth. In both models, more LC youth spend time in day treatment and in other inpatient treatment than FBP youth. When looking at frequency of visits within each service, the eight covariate model revealed that more FBP youth visit the doctor and school counselor than the LC group. In the three covariate models, only likelihood of visiting doctors was significant, with more FBP youth than LC youth visiting a doctor (see Tables 12 and 13). It should be noted that some service outcomes were so rare that the models were unable to run. However it is these rare service outcomes that can be very costly (for example: one youth spending 75 days at an inpatient facility).

Calculation of Benefits for the FBP Intervention

The primary goal of this study was to calculate the benefits of the FBP by analyzing mental and behavioral health service use between the LC and FBP groups. The monetary between-group difference serves as the measure of the FBP benefits in the form of cost avoidance. This means that by delivering the FBP, it saves society a certain amount of money by not having to treat individuals who might have otherwise needed treatment for mental or behavioral health-related problems. The benefits (the difference in total cost of services between the LC and FBP groups) were applied to the cost of the intervention (Foster, Porter et al. 2007) to determine whether the FBP was cost beneficial and saved society money.

Calculation of the benefits of the FBP required two steps. The first step was to count the frequency of utilization in all service categories (doctor, ER, counselor, school counselor, day treatment, inpatient treatment and prescription drug use) by group and by youth and caregiver. This is reported previously. The second step was to assign costs (as described earlier in the methods section) to each visit within service categories and to the prescription drug uses that were reported by participants (Hargreave et al., 1998).

Next, total costs for the eight service categories were calculated. Using AHCCCS fees and other aforementioned estimates of cost of services (see Methods), the appropriate fee was applied to the number of visits reported by the LC and FBP youth and caregivers within each service. For example, LC youth reported 40 doctor visits; 40 visits were multiplied by the appropriate AHCCCS fee per doctor visits to come up with a total cost for the LC youth in this service category. This method was used to calculate the total cost for each service category reported by LC and FBP youth and caregivers and was applied to all services.

Total and Average Costs for Service Use

After calculating the total cost per service within each group, the average cost per participant within each group was calculated. To do this, the total costs were divided by the number of participants in this benefit cost study, which is a subset of the total participants in the FBP 6 Year follow up study. For this study, there were 100 LC youth, 112 FBP youth, 60 LC caregivers, and 75 FBP caregivers. The following results indicate the source for the fee that was used in the cost estimates, the actual fee, the total cost per actual visits and the average cost per participant in the study.

Doctor visits. The AHCCCS fee for a 15-20 minute doctor visit was $52.88. The LC youth had 40 visits which totals to $2,115 for all visits. The FBP youth had 78 visits, totaling $4,125. LC caregivers had 37 visits, totaling $1,957 and the FBP caregivers had 23 visits which equaled $1,216. When group costs were added together, the cost of service use for FBP participants was greater than for LC participants (see Table 14). The average cost per visit across all LC youth was $21; for FBP youth, the average was $37. Average cost per visit for LC caregivers was $33, and the average cost for FBP caregivers was $16 (see Table 15).

Emergency Room visits. Average cost for emergency room visits was $569 in 2008 (MEPS, 2008). When converted to 2011 dollars, this rate is $659 per visit. Only the LC and FBP youth had visits to the emergency room. For the LC youth, six visits totaled $3,954 and for the FBP youth, one visit totaled $659. The combined LC group cost more than the FBP group, (see Table 14). The average cost per person in the LC group was $40, and the average cost per person in the FBP group was $6 (Table 15)

Counselors. The average rate for a 45 to 50 minute therapy session was $85.81. The LC youth had 146 visits; the FBP youth had 171 visits in the past year. The total cost for the LC youth was $12,528; for the FBP youth, the total cost was $14,674. The LC caregivers had 110 visits and the FBP caregivers had 53 visits. The total cost for LC visits was $9,439 and for the FBP caregivers, the total cost for visits was $4,548. Combined LC group cost more than the combined FBP group, (Table 14). Average cost per person across LC youth was $125; across the FBP youth the average cost per person was $131. Average cost per person in the LC caregivers was $157 and for the FBP caregivers, the average cost per person was $61 (Table 15).

School counselors. Wage data from the Bureau of Labor Statistics showed that Arizona school counselors were paid an hourly rate of $22.00. School counselors spend approximately 30 minutes per session with a student. The LC youth had 69 half-hour visits, which equaled 34.5 hours. By multiplying 34.5 by the hourly rate, total cost of services for the LC youth was $966. The FBP youth had 92 half-hour visits, the total cost for the FBP youth was $1,288. Only FBP caregivers had services with school counselors, they had 20 half hour sessions for a total of $280. This is the one of two service categories that the combined FBP group cost more than the combine LC group (Table 14). The average cost per person across participants was $10 for the LC youth, $12 for the FBP youth and $4 for the FBP caregivers (Table 15).

Day treatment. Day treatment rates were calculated using two hours of individual therapy at $61.84 and 6 hours of group therapy at the rate of $32.75 for a total daily rate of $320. Only LC youth and LC caregivers used day treatment services. LC youth spent 12 days which totaled $3,984 in service costs. LC caregivers spent 5 days which totaled $1,601 in service costs. Clearly the combined LC group’s costs were higher than the FBP group since the FBP group did not report any day treatment services, (Table 14). The average cost per person was $40 per LC youth and $27 for LC caregivers (Table 15).

Inpatient treatment. Arizona AHCCCS pays a flat daily rate for inpatient treatment, which is $700 per day. The LC youth had 101 days spent at inpatient treatment facilities for a total cost of $70,735. The FBP youth spent 30 days at inpatient treatment facilities for a total of $21,011. Only LC caregivers spent time in inpatient treatment, they spent 30 days for a total of $21,011. The LC group had more inpatient treatment service cost than the FBP group (see Table 14). Average cost per person was $707 for the LC youth and $188 for the FBP youth. For the LC caregivers, the average cost per person was $350 (Table 15).

Prescription drugs. The Red Book Drug reference provides costs of all prescription drugs. For this study, the Average Wholesale Price (AWP) for 2003 was used. A price for each prescription based on the AWP, dosage and frequency per month (dosage and frequency were reported by the participants). Because participants were not asked how long they took the medication, estimates were made using 30, 90 and 180 days. All costs have been converted to present day value (5% rate from 2003 to 2011 (BLS, 2011b; 2011c; Viscusi, 1995). The LC youth had 16 prescriptions for a total cost of $3,014 (30 days), $9,043 (90 days), and $18,086 (180 days). The FBP youth had 27 prescriptions for a total cost of $4,544 (30 days), $13,632 (90 days), and $27,264 (180 days). The LC caregivers had 25 prescriptions for a total cost of $3,510 (30 days), $10,530 (90 days), and $21,060 (180 days). Caregivers in the FBP group had 20 prescriptions which totaled $2,772 (30 days), $8,316 (90 days), and $16,632 (180 days), see Table 14. The average prescription cost per participant for 30, 90 and 180 days respectively was: LC youth $30, $90 and $181; FBP youth $41, $122 and $243; LC caregivers $59, $176, $351 and for the FBP caregivers, average costs were $37, $110 and $222 (see Table 15).

Estimated Program Cost per Year

The FBP intervention was delivered to 243 participants, of which there were 90 families comprised of 135 youth and 108 caregivers. At the time of the FBP intervention, if there was more than one caregiver per family, one was assigned by the FBP team as the target caregiver. At the six year follow up, the FBP team only collected caregiver data from the target caregiver. Therefore, adjustments were made to the intervention costs per person reported previously to reflect the per person intervention cost among the targeted study population. That is, there were 90 target caregivers and 135 youth for a total of 225 participants who received the FBP intervention and whom we contacted to collect data from at the six year follow up. To calculate the adjusted per person intervention cost, the total intervention cost (as calculated in Foster, Porter et al., 2007) was divided by 225 (the number of targeted participants) instead of 243 (the actual number of participants); see the last column in Table 16.

Analysis of the Costs Averted by the Family Bereavement Program

The benefit cost ratio is represented as Present Day Value of Benefits divided by Present Day Value of Costs (PVB/PVC) (Gold et al., 1996; Sloan, 1995). Benefits are derived from the difference between the costs of the services that the intervention group incurred and the costs that the control group incurred. The cost of the intervention includes all direct and indirect, implicit and explicit costs of delivering the 12 week FBP intervention. The cost does not include any research costs related to developing or testing the intervention. These calculations were computed in a previous cost study (Foster, Porter et al., 2007) and the results are displayed by cohort in per family, per person and per contact hour format in Table 16. It should be noted that the figure used for the cost of the intervention this study is based on the cost of the FBP as it was actually delivered and that the cost of the intervention would be lower if delivered by a community agency. In this study only the intervention cost per participant was used.

Calculations of the costs averted by participation in the FBP were derived by finding the monetary difference between the LC and FBP service use for the one year time period. Average costs per person in each service category were added for a total average cost for youth ($973 LC and $413 FBP) and caregivers ($625 LC and $118 FBP). Next, the difference between the LC and FBP youths' average service costs and the difference between the LC and FBP caregivers' average service costs were calculated ($560 for youth, $508 for caregivers). The difference between the groups, calculated at this step, are the costs averted by the FBP intervention. We consider the averted costs to be the benefits of the program. Next, the benefits were subtracted from the cost of the intervention (note that the per person cost of the intervention {$1,983} was converted to 2011 present dollars {$2,657} to ensure consistency in the cost basis across all inputs) by youth and caregiver.

Finally, to calculate the benefit cost ratio, the cost of the intervention ($2,657) was divided by 6 to get a yearly cost of the intervention ($442) from the end of the treatment through the sixth year when service data was collected. The rationale for this procedure is that the intervention costs were fixed to a single point in time; however, the benefits are realized over multiple years. In the present study, service data were only collected in the 6th year; thus, this study does not take into consideration the benefits obtained in the prior five years. Moreover, there is an underlying assumption is that the benefits from participating in the program will persist among the FBP group, even six years after the FBP has ended. Therefore, to allow for an equivalent comparison of the program costs to the service costs collected during the sixth year after the program, we depreciated the total cost of the program equally over the six years since the program ended. As stated above we converted the cost of the program from 2005 dollars to their present (2011) dollars, using a 5% rate (BLS, 2001b; 2011c; Viscusi, 1995). Using the benefits from the 6 year service data may be conservative since there may have been greater group differences that we have not captured, immediately following the intervention. Next, the benefits from the intervention were divided by the cost of the intervention for the benefit cost ratio. This was done for youth and caregivers separately. For example, the benefit for the youth was $560; this was divided by the yearly cost of the intervention, $442 (which represents $2,657 total program cost per person divided by 6 years, as discussed above). The resulting benefit cost ratio is 1.27. This means that every dollar invested on the intervention returns $1.27 in benefits. Following the same formula, we see that for the caregiver, every dollar spent on the intervention returns $1.15 in benefits, see Table 17.

Sensitivity Analysis of Assumptions

Sensitivity analysis was conducted to determine how variations in assumptions affect the benefit cost ratio. The cost of the intervention is fixed; therefore only the benefits were varied. A major assumption in the calculations was that AHCCCS rates were used for all the service categories where the fees were available. As part of the sensitivity analysis, two other models were calculated. The first model used all the real cost data from the billing records and made estimations based on these real costs for the services that did not have actual cost records. For example, for the counselor category, actual cost data for 41 of the 146 visits to counselors that the LC youth made. After summing the data for the 41 visits ($3,604) and dividing it by 41 to get an average real cost per visit ($88), this average was multiplied by the total number of visits (146) to calculate a real cost total for all counseling visits ($12,832) for the LC youth. This formula was used for each service category where real cost data from billing data (doctor and counselor) were available. The estimated costs for ER, school counselor, day treatment and inpatient treatment because there were no billing records available. There was less than a 2% difference from the original model in the benefits across all three calculations (three different prescription drug time periods) within this ‘real cost’ scenario.

The second model used the actual cost data from the billing records when they were available and AHCCCS estimates for the services where no cost data were obtained. Using the same example of the LC youth counselor visits, of the 146 visits, cost data were available for 41 visits ($3,604); costs needed to be estimated for 105 visits using the AHCCCS rate of 85.81 ($9,010). These two figures were added for a total for all LC youth counselor visits ($12,613). This formula was used for doctor and counselor services where real cost data could be derived from billing records. ER, school counselor, day treatment and overnight treatment costs remained the same because billing records were not obtained for these services. There was less than a 2% difference from the original model in the benefits across all three calculations within the mixed real cost and estimated cost scenario.

Lastly, for both models described above, I applied the benefit cost ratio (Present Day Value of Benefits divided by Present Day Value of Costs) to determine if the original findings were robust. For youth, results from the first model using real cost data showed a benefit cost ratio of 1.19 and a ratio of 1.14 for caregivers. This is a benefit of $.19 and $.14 for every dollar spent on the intervention for youth and caregivers in turn. In the second model, which used a mix of estimates from AHCCCS and real cost data, the ratio was 1.28 and 1.09 for youth and caregivers respectively. These ratios reflect a benefit of $.28 and $.09 for every dollar spent on the intervention for youth and caregivers, correspondingly. The original model using all estimates to calculate costs, revealed a benefit cost of $.27 and $.15 for every dollar spent on the intervention for youth and caregivers. Both models in the sensitivity analysis have a 6% or less difference in the benefit cost ratio from the original model. See Tables 17 and 18 for results from all calculations.

The sensitivity analysis demonstrated that the overall cost-benefit results were robust to changes in the cost of service assumptions. The overall cost savings varied, according to which service costs were used in the estimates; however, the results of all three scenarios favored the FBP intervention. The original model, using AHCCCS rates for service costs, resulted in the most conservative cost savings estimates.

DISCUSSION

Improving mental health outcomes for youth and adults through prevention programs is intrinsically important for society; however researchers must go one step further and demonstrate the economic benefits of such programs. Funds for prevention programs are scarce; thus, policy makers and funding agencies are requiring evidence of both program effectiveness and cost efficiency before providing funding (Foster & Jones, 2007; Romero, Byford, & Knapp, 2005; Vos, Haby, et al., 2005b). Economic evaluations of mental and behavioral health prevention programs for youth and families are rare and have, only recently, come to the forefront as an important component in prevention science (Foster & Jones, 2007; Romero et al., 2005). Most prior economic evaluations of behavioral and mental health prevention programs were limited to prevention programs for substance use, early childhood education, and conduct disorder/delinquency (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004; Curry, Grothaus, McAfee, & Pabiniak, 1998; Foster, Dodge, Jones, 2003; Foster & Jones, 2007; Guyll, Spoth, & Crowley, 2011; O'Neill, 2009; Reynolds, Temple, Roberston, & Mann, 2002). The current study is one of the first cost-benefit analyses of a bereavement intervention program (FBP) designed to reduce mental health problems among parentally bereaved youth (see also Foster, Porter et al., 2007).

The purpose of the present study was to examine a vulnerable population, families who had experienced the loss of a parent/spouse, and to conduct a cost evaluation demonstrating the monetary benefits of the intervention program to society. This study, conducted six years after the intervention, tested several hypotheses about the services used by youth and caregivers in the literature control (LC) and intervention (FBP) groups of the FBP trial. The specific goals of the study were to compare the LC and FBP intervention groups on: (a) the number of participants using mental/behavioral health services and prescription drugs; (b) the frequency of participants' use of mental/behavioral health services and prescription drugs; and (c) the cost of mental/behavioral health services and prescription drugs. The final goal (d) was to calculate the benefits of the FBP by analyzing monetary difference between the LC and FBP groups in terms of costs of services used, and then apply those benefits to the cost of the intervention.

For the first goal (a), it was hypothesized that compared to LC participants, fewer FBP participants would use mental and behavioral health services at six years post intervention. For the next goal (b), it was hypothesized that FBP participants would use fewer mental and behavioral health services and prescription drugs than LC participants would use. The third (c) hypothesis was that the FBP group's total cost of services for mental and behavioral health and prescription drug use would be less than the total cost of the same types of services for the LC group. Finally, the last hypothesis was (d), that benefits of the FBP program (the mental/behavioral services use and prescription drug costs averted by participation in the FBP), when applied to the costs of delivering the intervention, would reveal positive, monetary benefits to society.

Service Use Patterns and Costs

The first two aims of this study were to compare the youth and caregivers in the FBP and LC groups on the number of participants in each group who used mental and behavioral health services and prescription drugs and on participants' frequency of use. The youths and caregivers reported on their service use using a comprehensive list of mental health service providers, including doctors, ER providers, counselors, school counselors, spiritual advisors, and day treatment and in-patient treatment providers. They also reported on their use of prescription drugs. Assessing service use along such a broad spectrum of categories is rare in economic evaluations, particularly in relation to prevention programs. In other words, service use is often examined in the context of investigating patterns of use, barriers to use, and demographic differences in use outcomes, but rarely as a primary economic outcome variable (Andersen & Newman, 2005; Bertakis, Azari, Helms, Callahan, & Roberts, 2000; Yampolskaya, Greenbaum, & Briscoe, 2008). Thus, costs associated with mental health service use are not typically included in economic evaluation of prevention programs. Instead, the focus is broadly on the costs associated with physical illness and mental health disorders (such as quality of adjusted life years, disability-adjusted life years, and willingness-to-pay, which assign value to intangible factors such as age, mortality, and morbidity), or criminality as the economic outcome (Cohen & Piquero, 2009; Singh, Hawthorne & Vos, 2000; Vos, Corry, et al., 2005a). However, mental health problems cost society billions of dollars per year. In 2002, the economic burden of mental health problems topped $317 billion in the United States (Insel, 2008) and the World Health Organization (WHO) estimated the global cost of mental health problems at $2.5 trillion dollars in 2010 (WHO, 2011). Undeniably, mental health problems are expensive to society. An advantage of using mental and behavioral health service use data to examine mental health problems verses economic assessments is that these data give a clear picture of who is using the services, what type of services are being used, the frequency of use and how much those services cost (Doctor, Zoellner, &

Feeny, 2011; Olatunji, Cisler, & Tolin, 2007; Tengs & Wallace, 2000). Thus, the methods used here are relatively unique and provide an important new avenue to consider in future cost evaluations.

The first hypothesis, that fewer FBP participants would report using services than would LC participants, was generally supported by a review of descriptive statistics, by the logistic regression analyses. Fewer FBP youth reported using mental health and behavioral services and prescription drugs than LC youth in all categories, except school counselors and spiritual advisors. Additionally, both groups had an equal number of individuals reporting inpatient service use (one each). Similarly, fewer FBP caregivers reported service use than LC caregivers, except for school counselor visits. Additionally, neither FBP nor LC caregivers report using ER providers or spiritual advisors.

However, the second hypothesis that FBP participants would use fewer services than LC participants was not supported for youth but was for caregivers (based upon a review of descriptive statistics and geometric means). Among the youth who visited mental health professionals, FBP youth had considerably more visits than did LC youth, particularly in the categories of doctor visits, counselor visits and school counselor visits – forms of service use that are relatively low in intensity. They also used more prescription drugs than the LC youth. The pattern was different, however, for high intensity services, such as inpatient and day treatment services. The LC youth used these services more frequently than did the FBP youth. In contrast, FBP caregivers' frequency of service use was less than the LC caregivers', except for school counselor visits. This interpretation is supported by the results of the Poisson regression analyses.

Despite these variations, the total cost of services for the FBP group was less than the total cost of services for the LC group. This finding supported the third hypothesis (c). Indeed, the total costs of mental health services and prescription drug use for participants in the LC group were greater than the total costs of mental health service and prescription drug use for participants in the FBP group. For instance, using 30-day prescription drug use costs in the total calculations, the LC participants' service costs totaled $134,821 compared to the FBP participants' service costs of $55,128. Per year, the average cost per participant, using 30-day prescription drug use costs, was $842 for LC participants and $294 for FBP participants. These cost estimates represent one year of mental health costs across all service categories. Thus, the LC participants' service cost was about two and one-half times more than the FBP participants' service cost.

The finding that fewer FBP youth used services but did so more frequently (at least for low intensity services) than did LC youth seems, at first glance, counterintuitive. However, upon closer examination, there are several possible explanations for this finding. Youth tend to have a low rate of mental health utilization (Angold et al., 1998; Logan & King, 2002; Teagle, 2002), and they rarely refer themselves for treatment. Instead, youth are usually referred by their parents, who recognize the youth's need for mental health services (Angold et al., 1998; Teagle, 2002). The FBP caregiver intervention was targeted to improve positive interactions between parents and children and to assist caregivers in helping their children with problem solving and with coping. As a result of the intervention, FBP caregivers may have become more aware of their youths' distress and recognized the need for mental health help more readily than LC caregivers did. Another possibility is that by participating in the FBP, caregivers may have been more receptive to seeking treatment since the format of FBP allowed them to share experiences and to work on problems within the intervention, whereas the LC caregivers did not share this experience. Thus, FBP caregivers may have been more likely to seek out and follow through with outside help at the first signs of distress by bringing their youth to doctors and counselors. The finding that FBP youth also used more prescriptions drugs and had more visits with school counselors than the LC youth would also fit with this interpretation. In other words, regular visits with doctors and counselors might be associated with increased medication compliance and with receiving support in school settings. Thus, it is possible that LC caregivers were less attuned than the FBP caregivers to early signs of distress in their youth. Therefore, the LC youths' problems may have reached a greater level of severity before the LC caregiver was compelled to seek services, and as a result, these youth required more intensive treatment.

Although bereavement research has not examined this relation between high service use and less costly treatment, the medical field provides many examples of this phenomenon. High health care utilizers, those who see doctors more frequently for minor issues or for scheduled examinations, have fewer serious illnesses than those who seldom see doctors for any reason and skip routine checkups (Kannan, Gaydos, Atherly, & Druss, 2010; Astin, Pelletier, Marie, & Haskell, 2000; Schuster, Dobson, Jauregui, & Blanks, 2004; Sointu, 2006). Olds and colleagues (1998; 1999) found similar results from their nurse home visit program. The goals were to reduce multiple pregnancies, to promote children's health, and to develop and strengthen the families' economic self-sufficiency. They found that the home visits by the nurse increased the time between pregnancies and reduced the number of pregnancies, reduced the rates of childhood injuries that could be a result of neglect and abuse, and increased the women's economic self-sufficiency by getting them back into the work force sooner because of fewer babies. In a 15-year follow-up study of the children of these mothers, Olds and colleagues (2004) found that the program children had fewer behavioral and delinquency problems than the comparison group. Thus, higher service use (regularly visiting nurses) resulted in less intensive and costly problems in the long term for those families who were part of the intervention program.

It is important to note that the findings reported above come from descriptive mean comparisons, but not from statistical comparisons of means. Multilevel models, which were conducted to predict service utilization using baseline variables, showed few significant differences between the LC and FBP groups on service use. This is likely due to methodological limitations. That is, the sample size was relatively small, and when service use was categorized into the eight service categories separately for LC and FBP youths and caregivers, many of the cell sizes were quite small. In fact, several cells had scores of one or fewer (for example, neither LC nor FBP caregivers used ER services). For other cells however, scores were much larger because a few of the participants used many of the services. Thus, the sparseness and inconsistency of the data may have contributed to a lack of power to detect significant differences across the groups. This is not uncommon, and health data is often skewed in this way (Wolinsky, 1978; Guevara, Lozano, Wickizer, Mell, & Gephart, 2001).

An added concern that was discovered while exploring potential covariates for the multilevel analyses was that few of the baseline pre- and post-death demographic variables were significantly related to service use. The prior research literature has identified some characteristics that predict mental health service utilization in youth. These include gender, age, and lack of knowledge about psychiatric disorders, socioeconomic status, parental mental health service use and parental burden (Angold et al., 1998, Wu et al., 1999). However, in this study similar patterns of use were not found, most likely due to the above mention methodological problems with sample size. Thus, further research is needed to identify predictors of mental health service use among the participants in the FBP intervention so those variables can be appropriately included as covariates in analyses (or targeted and enhanced to facilitate positive mental health outcomes in future iterations of the FBP intervention).

Benefit Cost Analysis of the FBP

The primary hypothesis of this study was that the benefits of the program would be greater than the cost to deliver the intervention. The benefits were operationalized as the costs averted by the FBP groups' use of fewer and less costly services for mental or behavioral health (the difference between the LC group costs and the FBP group costs), divided by the cost of the intervention. This hypothesis was supported by the findings. The resulting benefit cost ratio showed that the FBP intervention cost society less in terms of mental and behavioral health and prescription drug costs than the cost to deliver the FBP intervention (Foster, Porter et al., 2007). The results showed that for every dollar spent on the intervention, $1.27 for youth and $1.15 for caregivers was saved in societal costs. This positive benefit remained in the sensitivity analyses as well, with savings ranging from \$1.07 for youth to \$1.39 for caregivers. This means that for every dollar spent on the intervention, society gained in benefits. It is important to note that these cost estimates were based on only one year of service use (in the sixth year after the intervention) and one year of costs, thus the benefit cost ratio calculated in this study is likely a conservative estimate.

Overall, findings suggested that fewer FBP participants used mental health services and prescription drugs than did LC participants. Yet, for those participants who used services, FBP participants tended to use mental health services and prescription drugs more frequently than did LC participants. However, the services that LC participants used were more intensive and more expensive services than the FBP participants used. Thus, the cost evaluation analysis demonstrated that the FBP program was cost effective in both total expenditures and in the benefit cost ratio.

Strengths and Limitations

Strengths. The costs averted by the FBP program were calculated using a combination of real cost data collected from billing records and cost estimates based on AHCCCS physician and service fee schedules. These estimates were meticulously researched and based on several factors including time spent in doctor and counselor appointments, the complexity of the visit, the type of therapy that was delivered as well as the combination of therapies in outpatient treatment. All costs based on estimates were corroborated and confirmed with local mental health agencies, hospitals, and emergency service providers and clear details were reported. In a comparison of studies reporting service use for cost analysis, the current study provides more rigor and transparency in estimations than many other studies because it is clear in the sources used for estimation, the fees used to calculated costs, and the overall calculations of expenditures (French, Salome, Sindelar, & McLellan, 2002; Roberts, Bergstralh, Schmidt, & Jacobsen, 1996). The existing benefit cost analysis that is an exception to this point is the Fort Bragg Demonstration (Bickman, Lambert, Andrade, & Penaloza, 2000; Foster & Bickman, 2000). In the Fort Bragg Demonstration, the researchers had the support of the US ARMY and thus were able to access all military medical and billing records. As in the present study, the Fort Bragg Demonstration delineated every step and detailed the cost calculations. Thus, the attention to detail and meticulous calculations that were applied in this study contributes to the strength of the study and may be used as a guideline for future benefit cost studies of service utilization.

Additionally, the present study is one of the first studies to assess service usage for both youth and caregivers within a family-focused intervention. Consequently, considering the economic impact of the intervention on multiple family members it is also a unique feature of this study. Most other economic evaluations of prevention programs look at only one population (Aos et al., 2004; Bickman et al., 2000; Foster, Johnson-Shelton, & Taylor, 2007; Foster, Jones, & CPPRG, 2005; 2006), mainly because the individual program is focused on only one problem such as teen pregnancy, drug use, or delinquency (Aos et al, 2004; Knapp, 1997). The FBP is a prevention program aimed at the whole family, not individuals and assumes that families interact and influence each other, particularly after a traumatic event like the death of a parent. In fact, spousal grief has been shown to affect parenting behaviors and to have long term negative effects on their youth (Cerel et al., 2006; Harris et al., 1986). An economic evaluation such as this one, that examines both youth and caregivers, can shed light on the kind of services and the frequency of services that bereaved families use, as well as the economic impact of the services on society. Thus, prevention scientists can now identify how best to treat bereaved families in the most cost efficient manner.

Limitations. The cost estimates obtained in this study may be conservative due to several reasons: (a) estimates were based on Arizona's Medicaid (AHCCCS) Physician's Fee schedule, (b) costs may have been overstated due to manipulation of the intervention costs, (c) intervention costs were based on the actual efficacy study and not what it would cost to deliver in a real world clinical setting, and (d) service use data was only collected at one point in time, six years after the intervention. Arizona has one of the lowest payment schedules for mental health services, and the cost estimates in this study were based on those payments. This means that the cost averted by the FBP could be potentially greater if estimates were made using another state's Medicaid fee schedule, thus revealing a higher benefit cost ratio.

Additionally, the intervention costs were manipulated to reflect only one caregiver per family. Because there were 18 additional caregivers who received the FBP and because the intervention cost used in this study was based per person, we recalculated the per person cost after subtracting the 18 extra caregivers. Originally there were 243 FBP participants (90 families, 108 caregivers and 135 youth) for an average cost of $1,836 per person (in 2005 dollars). After subtracting the extra 18 caregivers, the cost was recalculated and the average per person cost was $1,983 (in 2005 dollars). In reality, the extra caregivers likely did not cost the intervention any additional expenses because the intervention costs were established before the first session was delivered. If we had used the original per person cost of $1,836 in the calculations, it would have resulted in greater costs averted and a higher benefit cost ratio.

Also, the intervention costs were based on the efficacy study and were likely considerably higher than what the costs would be in a real world clinical or community agency setting. Administrators from community agencies reported that they could provide a similar service for half the cost (Foster, Porter et al., 2007). Thus, because service costs would be similar and the intervention would be less costly, the ratio of the costs averted by the intervention would be greater than what is reported here had we used real-world intervention delivery costs.

The service use data in this study were compelling. Yet, an even stronger case could have been made if we had data from earlier points after the intervention was completed. An issue that was a concern when analyzing service use in this study was frequency of data collection. This limitation pertains to many other cost evaluation studies as well. That is, most studies examine service use several years after an intervention was delivered. Participants are asked binary (yes/no) questions about use over a lifetime, use in the past five or six years (depending on how many years since the intervention) and use in the past year. Details of the service use are only collected for the past year (Haro et al., 2006; Hoagwood et al., 2000; Kessler & Ustun, 2004). The ‘past year’ is usually 5 or 6 years after the intervention was delivered (in the case of this study, it was 6 years). Therefore, we can only make educated estimates about the use in the years immediately following the intervention. It would be ideal to examine service use in the year immediately following an intervention, followed by yearly or bi-yearly follow-up assessments to account for peaks of high usage as well as when the usage begins to taper off or stabilize. By evaluating service use patterns and collecting cost data more frequently, we may be able to predict when needs and costs would be the highest after an intervention and when needs and costs stabilize for vulnerable populations. This is an important direction for future cost evaluation research.

Finally, only benefits from averted mental, behavioral health service and prescription drug use were calculated. Benefits from averted costs in foster care, special education, and criminal costs as well as benefits derived from support groups for FBP participants were not examined as part of this study. Thus the benefits of the intervention revealed from this study are underrepresented even though all the costs are accounted for. Omission of these benefits contributes to a conservative benefit cost ratio. It would be ideal to examine the benefits from the omitted categories in a future study to show the complete benefit cost ratio of the FBP intervention and to reveal total societal savings.

Conclusions and Future Directions

Overall, this study demonstrated that the FBP intervention resulted in reductions in mental and behavioral health services and prescription drug usage, and in less intensive and less costly total service use. It further demonstrated that the FBP saved society more money in mental and behavioral health expenditures than the program cost to deliver. These findings supplemented research from prior efficacy studies of FBP, which showed a positive effect of the FBP in reduction of mental health problems and promoting positive outcomes. Sandler and colleagues (2003; 2007; 2010a; 2010b) found that the FBP improved parenting, coping, and caregiver mental health, reduced internalizing and externalizing problems in youth and caregivers, and promoted higher self-esteem in youth. These data will contribute to the dissemination efforts of bringing the

FBP into community settings. Bereavement researchers can use these data when requesting funding for this or similar programs aimed at families who experience loss, by providing actual costs for the services averted by the program, by demonstrating the savings to society, and by citing prior efficacy data to show reductions in mental health problems and increases in positive outcomes.

As this study suggests, the need for more economic evaluations of prevention programs is warranted. With more and more policy makers and funding agencies requiring empirically sound efficacy, effectiveness, and economic data before granting funds to deliver programs, the need has never been greater for strong economic evaluations of programs. With more economic analysis data available for prevention programs, policy makers and funding agencies will be better able to compare programs and target the resources to generate the best outcomes for specific populations.

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APPENDIX

NUMBER OF PARTICIPANTS USING SERVICES ACROSS SIX-YEAR FOLLOW UP PERIOD

From Table A, we see that fewer youth in the LC group reported using services in the past six years as compared to youth in the FBP group. The only exception was that both groups had equal reports in the day treatment category. However, more caregivers in the LC group reported using services than caregivers in the FBP group. This was consistent across all categories with the exception of seeing a doctor (both groups had the same number of reporters) and school counselor (more caregivers in the FBP group reported seeing a school counselor than did caregivers in the LC group) (see Table B). It should be noted that when reporting service use for six years, participants were not asked whether they saw a doctor or went to an emergency room for physical or mental health reasons. We only followed up to determine the reason for the service if the participant endorsed the service for the past year; therefore the number of participants receiving services in the past six years include physical and mental health services.

Table A

Number of Youth Using Services in Six Years

Service	Literature Control *n*=100	FBP *n*=112
Total Dr reports	68	80
Total ER reports	25	32
Total Counselor reports	24	26
Total School Counselor reports	17	23
Total Spiritual Advisor reports	5	8
Total Outpatient reports	4	4
Total Inpatient treatment	1	5
Total Other Inpatient treatment	1	2
Prescription drug use	10	13

Table B

Number of Caregivers Using Services in Six Years

Service	Literature Control *n*=60	FBP *n*=75
Total Dr reports	18	18
Total ER reports	5	1
Total Counselor reports	4	2
Total School Counselor reports	0	2
Total Spiritual Advisor reports	6	4
Total Outpatient reports	2	1
Total Inpatient treatment	3	1
Prescription drug use	23	20

Table 1

Number/Percentage of Youth Using Services in Past Year

Service	Number of LC	Percentage LC	Number of FBP	Percentage FBP
Total Dr (MH)reports	13	.13	8	.07
Total ER (MH)reports	3	.03	1	.008
Total Counselor reports	18	.18	17	.15
Total School Counselor reports	13	.13	16	.14
Total Spiritual Advisor reports	2	.02	4	.04
Total Outpatient reports	1	.01	0	--
Total Inpatient treatment	1	.01	1	.008
Total Other Inpatient treatment	1	.01	0	--
Prescription drug use	11	.11	12	.11

Note: LC youth *n*=100, FBP youth *n*=112

Table 2

Number/Percentage of Caregivers Using Services in Past Year

Service	LC	Percentage LC	FBP	Average FBP
Total Dr (MH) reports	10	.17	6	.08
Total ER (MH)reports	0		0	
Total Counselor reports	12	.2	6	.08
Total School Counselor reports	0	--	1	.01
Total Spiritual Advisor reports	0	--	0	--
Total Outpatient reports	1	.02	0	--
Total Inpatient treatment	1	.02	0	--
Prescription drug use	14	.23	13	.17

Note: LC caregivers *n*=60, FBP caregivers *n*= 75

Table 3

Youth Report of the Frequency/Averages of Visits/Days/Number of Drugs within

Variable	Freq of services (LC) *N*=100	Average service per LC youth	Freq of services (FBP) *N*=112	Average service per FPB youth
Total number of MH Dr visits	40	.40	78	.70
Total MH related ER visits	6	.06	1	
Total Counselor visits	146	1.46	171	1.52
Total School Counselor visits	69	.69	92	.82
Total Spiritual Advisor visits	5	.05	15	.13
Total outpatient/day treatment	12 days	.12 day	0	
Total Inpatient treatment	75 days	.17 day	30 days	.27day
Total Other Inpatient treatment	26 days	.26 day	0	
Total Prescription drug use	16 drugs*	.16 drug	27drugs*	.24 drug

Each Service Category for Past Year

* 11 LC youth used 16 prescription drugs, 12 FBP youth used 27 prescription drugs

Table 4

Variable	Freq of services (LC) *N*=60	Average service per LC caregiver	Freq of services (FBP) *N*=75	Average service per FBP caregiver
Total number of MH Dr visits	37	.62	23	.31
Total MH related ER visits	0		0	
Total Counselor visits	110	1.83	53	.71
Total School Counselor visits	0		20	.27
Total Spiritual Advisor visits	0		0	
Total Outpatient/day treatment	5	.08	0	
Total Inpatient treatment	30 days	.5 day	0	
Total Prescription drug use	25 drugs*	.42 drug	20 drugs*	.27 drug

Caregiver Report of the Frequency/Average of Visits/Days/Number of Drugs within Each Service Category for Past Year

*14 LC caregivers used 25 prescription drugs, 13 FBP caregivers used 20 prescription drugs

Table 5

Geometric Means of Youth Frequency of Services in Past Year Between LC and FBP Groups

Variable	Geometric Means - LC	SD	Geometric Means -FBP	SD
Total Dr MH visits	2.55	1.84	6.77	2.36
Total ER MH visits	1.59	2.23	1.00	*
Total Counselor visits	5.37	2.47	4.87	3.57
Total School Counselor visits	2.83	3.06	2.52	3.30
Total Spiritual Advisor visits	2.00	2.67	2.21	1.82
Total Outpatient visits	12.00	*	*	*
Total Inpatient treatment	75.00	*	30.00	*
Total Other inpatient treatment	26.00	*	*	*
Prescription drug use	1.33	1.52	1.30	1.50

*Unable to calculate

Table 6

Geometric Means of Caregiver Frequency of Services in Past Year between LC and FBP Groups

Variable	Geometric Means LC group	SD	Geometric Means FBP Group	SD
Total Dr MH visits	2.86	2.17	2.94	2.21
Total ER MH visits	*	*	*	*
Total Counselor visits	5.17	3.17	5.28	2.89
Total School Counselor visits	*	*	20.00	8
Total Spiritual Advisor visits	*	*	*	*
Total Outpatient visits	5.00	*	*	*
Total Inpatient treatment	30.00	*	*	*
Prescription drug use	1.51	1.75	1.42	1.51

*Unable to calculate

Table 7

Intercorrelations Between Baseline (Wave 1) Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Is this child male or female?	1	.07	.06	-.07	-.01	-.06	-.01	-.02	.08	-.02	-.03	-.08	-.02	-.22
2. Child age at W1		1	-.07	.07	.19	.26**	.01	.17	.15	-.06	.05	.07	-.10	-.11
3. Months since death			1	.05	.01	-.02	.07	-.15	-.05	.21*	.27**	.03	-.08	-.11
4. Group				1	.21	.13	-.05	.04	-.06	-.04	-.11	.00	-.01	-.05
5. Yearly income before death					1	.17**	.15	.37**	.49**	.21	.25*	.11	-.16	-.15
6. Income in last year (W1)						1	-.02	.41**	.32**	.14	.07	.18	-.06	-.02
7. Change in income since death							1	-.06	-.01	.00	-.14	-.15	-.02	.00
8. CG education level								1	.41**	.07	.09	.11	.12	.10
9. Deceased education level									1	.20*	.19	.11	-.09	.09
10. Professional assist for kids adjust										1	.63**	.34**	.17	.01
11. Professional assist to adjust											1	.29**	.04	.00
12. CG saw mental health provider												1	.34**	.a
13. Deceased treated for emotional problems													1	.00
14. Number of diff srvcs mental health														1

*$p < .05$, **$p < .01$

Table 8

Total Number of Youth Service Visits in the Past Year, Correlated with 8 Covariates (or with Baseline Variables, Wave 1)

	Child Gender	Child Age	Months since Death	Income in last year – W1	Change in income since death –W1	CG or child saw MH prof. to adjust to death	CC/Dec ever treated for MH problems	Max CG/Dec education level
No. of Services (Past Year)	.03	-.03	-.05	-.11	-.11	.01	.16*	00
MH Doctor	.01	-.07	-.06	.13	-.07	.01	.05	.07
MH ER	.06	.08	-.04	.00	-.08	.12	.20*	.01
Counselor	.08	-.11	.01	-.02	-.09	-.04	.12	.09
Sch. Counselor	.12	-.16*	.01	-.21*	-.11	-.11	-.01	-.24**
Spiritual Advisor	-.09	-.07	-.05	.19	.02	.19*	-.09	.06
Outpatient	-.08	.00	-.07	-.05	-.05	-.07	.12	-.02
Inpatient	.05	.00	-.07	-.12	-.05	-.07	-.06	-.02
Other Inpatient	-.08	.00	-.07	-.05	-.05	-.07	.12	-.02
Pres. Drugs	.07	.00	-.20*	.07	.07	.13	.10	.09

$*p < .05$, $**p < .01$

Table 9

Total Number of Caregiver Service Visits in the Past Year, Correlated with 8 Covariates (or with Baseline Variables, Wave 1)

	Child Gender	Child Age	Months since Death	Income in last year – W1	Change in income since death –W1	CG or child saw MH prof. to adjust to death	CC/Dec ever treated for MH problems	Max CG/Dec education level
No. of Services (Past Year)	.28*	.03	-.09	.03	-.11	.17	.07	.16
MH Doctor	.20*	.06	-.07	.02	.01	.18	-.05	.16
MH ER	-	-	-	-	-	-	-	-
Counselor	.07	-.02	-.09	.06	-.07	-.07	.17	.14
Sch. Counselor	.32	-.16	-.20	.09	-.09	-.17	.28	.11
Spiritual Advisor	-	-	-	-	-	-	-	-
Outpatient	.09	.07	-.04	-.01	-.06	.14	.12	.06
Inpatient	-.09	.04	-.10	.06	-.06	-.07	.12	.14
Presc. Drugs	.06	-.01	-.06	-.07	-.12	.15	.19*	.03

*p < .05

Table 10

Youth Intervention Group and 8 Covariates Predicting Binary Service Use Outcomes in the Past Year

Variable	*β*	*SE (B)*	*df*	*p*
Doctor visits	.390	.189	1	.039
Emergency Room visits	.042	.219	1	.849
Counselor	.035	.218	1	.873
School Counselor	.277	.207	1	.181
Spiritual Advisor	.242	.344	1	.482
Day Treatment	-1.427	.306	1	.000
Inpatient treatment	-.182	.521	1	.727
Other inpatient treatment	-1.322	.449	1	.003
Prescription drug use	-.035	.278	1	.899

Table 11

Youth Intervention Group and 8 Covariates Predicting Count of Service Use Frequency in the Past Year

Variable	*β*	*SE (B)*	*df*	*p*
Doctor visits	1.289	.399	1	.001
Emergency Room visits				
Counselor	-.602	.529	1	.255
School Counselor	1.019	.337	1	.002
Spiritual Advisor				
Day Treatment				
Inpatient treatment				
Other inpatient treatment				
Prescription drug use	-.070	.455	1	.878

Note. Where there are no values, the models did not converge due to sparseness of data and small sample size.

Table 12

Youth Intervention Group Predicting Binary Service Use Outcomes with Child Gender, Child Age and Time since Death as Covariates

Variable	*β*	*SE(B)*	*df*	*p*
Doctor visits	.411	.184	1	.026
Emergency Room visits	.019	.214	1	.930
Counselor	.071	.204	1	.729
School Counselor	.248	.201	1	.218
Spiritual Advisor	.173	.320	1	.590
Day Treatment	-1.294	.222	1	.000
Inpatient treatment	-.097	.400	1	.808
Other inpatient treatment	-1.125	.236	1	.000
Prescription drug use	-.096	.258	1	.710

**p* < .05. ***p* <.01.

Table 13

Youth Intervention Groups Predicting Frequency of Service Use in the Past Year with and Child Gender, Child Age and Time since Death as Covariates

Variable	*β*	*SE (B)*	*df*	*p*
Doctor visits	1.415	.497	1	.004
Emergency Room visits				
Counselor	.005	.390	1	.990
School Counselor	-.868	.586	1	.139
Spiritual Advisor				
Day Treatment				
Inpatient treatment				
Other inpatient treatment				
Prescription drug use	-.121	.461	1	.794

Note. Where there are no values, the models did not converge due to sparseness of data and small sample size.

Table 14

Services	LC Youth *n*=100	FBP Youth *n*=112	LC Caregivers *n*=60	FBP Caregivers *n*=75
Doctor visits*	$2,119	$4,133	$1,960	$1,219
Emergency Room	$3,954	$659	$0	$0
Counselor*	$12,528	$14,674	$9,439	$4,548
School Counselors	$966	$1,288	$0	$280
Day Treatment*	$3,984	$0	$1,601	$0
Inpatient Treatment*	$70,735	$21,011	$21,011	$0
Prescription Drug (30 Day)	$3,014	$4,544	$3,510	$2,772
Prescription Drug (90 Day)	$9,043	$13,632	$10,530	$8,316
Prescription Drug (180 Day)	$18,086	$27,264	$21,060	$16,632

Total Costs within each Service by Group for One Year

Services	LC Youth *n*=100	FBP Youth *n* =112	LC Caregivers *n* = 60	FBP Caregivers *n* =75
Doctor visits	$21	$37	$33	$16
Emergency Room	$40	$6	$0	$0
Counselor	$125	$131	$157	$61
School Counselors	$10	$12	$0	$4
Day Treatment	$40	$0	$27	$0
Inpatient Treatment	$707	$188	$350	$0
Prescription Drug (30 day)	$30	$41	$59	$37
Prescription Drug (90 day)	$90	$122	$176	$111
Prescription Drug (180 day)	$181	$243	$351	$222

Table 15
Average Cost of Service by Group

Table 16

Intervention costs from a societal perspective (explicit and implicit costs)

Explicit & Implicit	Per Family (*N* = 90)	Per Person (*N* = 243)*	Per Hour of Contact	Per Person (*N* =225)**
Cohort 1 (*n* = 39)	$5,004	$1,796	$65	$1,940
Cohort 2 (*n* = 42)	$4,726	$1,800	$65	$1,944
Cohort 3 (*n* = 37)	$4,233	$1,830	$67	$1,976
Cohort 4 (*n* = 32)	$7,799	$2,437	$89	$2,632
Cohort 5 (*n* = 32)	$4,918	$1,998	$73	$2,158
Cohort 6 (*n* = 61)	$3,354	$1,155	$42	$1,247
Mean	$5,006	$1,836	$67	$1,983

* The FBP intervention was delivered to 243 participants from 90 families. There were an extra 18 caregivers in this sample who were not the target caregiver. Thus there were 225 participants counting only the 90 target caregivers and 135 youth in the FBP intervention group.

** At the 6 Year follow up, only target caregivers were interviewed along with their youth and asked about their service use, therefor the intervention costs should reflect the target caregivers.

Table 17

Benefit Cost Ratio of the FBP Intervention at 6 Years Post Intervention

Group		30 day Prescription Drug	90 day Prescription Drug	180 day Prescription Drug
Youth				
Benefit		$560	$539	$508
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio		1.27	1.22	1.15
Caregivers				
Benefit		$508	$551	$615
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio		1.15	1.25	1.39

*All costs have been converted to present value 2011 costs

Table 18

Sensitivity Analysis - Benefit cost Ratio at 6 Years Post Intervention (Real Costs)

Group		30 day Prescription Drug	90 day Prescription Drug	180 day Prescription Drug
Youth				
Benefit		$528	$507	$475
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio		1.19	1.15	1.07
Caregivers				
Benefit		$506	$549	$614
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio (		1.14	1.24	1.39

*All costs have been converted to present value 2011 costs

Table19

Sensitivity Analysis - Benefit Cost Ratio at 6 Years Post Intervention (Mixed)

Group		30 day Prescription Drug	90 day Prescription Drug	180 day Prescription Drug
Youth				
Benefit		$567	$536	$505
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio		1.28	1.21	1.14
Caregivers				
Benefit		$480	$524	$588
Cost of intervention/6 years	$2,657	($442)	($442)	($442)
Benefit cost ratio		1.09	1.19	1.33

*All costs have been converted to present value 2011 costs