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SLEEP PATTERNS IN OLDER BEREAVED SPOUSES

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ABSTRACT

The study examined the prevalence and pattern of reports of sleep disturbance over two years in a group of 296 adults aged 50 years and over, and assessed the relationship between patterns of sleep disturbance and bereavement adjustment over time. A sample of 192 widows and widowers were compared to a matched sample of 104 non-bereaved persons. About half of the bereaved respondents experienced sleep disruption in the first month following their loss. Regardless of bereavement status, one-third of the sample experienced ongoing sleep disruption, and 10% consulted a physician for difficulty sleeping. Persons with a pattern of consistent sleep disturbance showed statistically significant differences in grief outcomes that persisted over time and tended to be female, older, with poor health, and taking more medications.

The adjustment process accompanying grief and bereavement can impact virtually every aspect of a person's life. Particularly in the case of spousal bereavement in later life, many married persons develop long-standing patterns of behavior that are disrupted by their spouse's death. Research over the past 25 years has contributed a great deal to our understanding of how the bereaved and widowed experience a roller-coaster like process of adjustment including changes in emotions,

attitudes, motivations, interests, spirituality, identity, social interactions, work productivity, financial stability, and physical and mental health. Much of the past research, however, has focused on broad outcome measures such as life satisfaction, morale, social participation, depression, wellness, or self-reported ratings of physical health along with indicators of difficulties such as doctor visits, use of medications and the onset of physical health problems (Lund, Caserta, & Dimond, 1993). Frequently, when many research studies conclude that the bereaved have worsened physical and mental health outcomes, the investigators often did not examine the daily life experiences that might help to explain and better understand why the adjustment outcomes changed. It is not sufficient to simply know that recently widowed persons are likely to be less healthy and/or more depressed than others without knowing more about why this happens. In other words, we need to more carefully examine selected aspects of the daily lives of those who are grieving.

This article explores some of the data from a previous longitudinal study of bereavement among spouses over the age of 50 and specifically highlights the potential importance that the quality of sleep might have on the coping process. Sleep is particularly relevant because many previous studies of bereavement have mentioned descriptively that sleep is frequently cited as a problem, yet it has been largely ignored as a primary area of investigation. It is quite likely that those who are grieving and experience significant problems with their daily lives are also having great difficulty sleeping at night. "Difficulty sleeping" at night can be expressed in several ways and in various levels of intensity. In order to better understand why a focus on sleep disturbances is relevant to the grief process, we need to know the features of healthy sleep, negative consequences of sleep disturbances, and what is known about sleep in older adults.

CHARACTERISTICS OF SLEEP AND AGING

Healthy sleep is characterized as efficient, lasting six to eight hours with little time in bed awake. Falling asleep occurs within 5-15 minutes of going to bed, and one does not awaken in the morning prematurely and lay in bed trying to achieve more sleep. Efficient sleep also is not fragmented, meaning that one does not awaken one or more times during the night. Healthy sleep is also characterized as being deep, without awareness of noise and activity in one's environment, and with a refreshing quality, so that one awakens feeling rested and ready for the day. Healthy sleep generally occurs at night, and may or may not be supplemented with one or two daytime naps. The length, efficiency, fragmentation, depth, quality, and supplementation of sleep all combine to form a sleep pattern. Sleep patterns vary between individuals, and vary within individuals from one night, week, year, or decade to the next, according to circumstances and age.

Age is an important factor affecting sleep patterns. Newborn infants' and young children's sleep is dramatically different from that of adults. During adolescence,

deep sleep decreases by approximately 40% (Carskadon & Dement, 1994). Deep and dream sleep decline with aging, though controversy exists regarding the age of onset, magnitude of decline, and importance of decline in these sleep characteristics in older adults (Bliwise, 1994; Hayashi & Endo, 1982; Webb, 1982). Opposing evidence exists regarding older adults' use of naps, their sleep latency, sleep efficiency, and awakenings (Hoch et al., 1997; Middlekoop, Smilde-van den Doel, Neven, Kamphuisen, & Springer, 1996). The depth of sleep may decrease with age, as a significantly higher noise intensity threshold is necessary to awaken younger subjects compared with older persons (Zepelin, McDonald, & Zammit, 1984).

The effects of inadequate or ineffective sleep are cumulative, with sequelae worsening as deprivation is prolonged (Dinges et al., 1997; Horne, 1985; Lorenzo, Ramos, Arce, Guevera, & Corsi-Cabrera, 1995; Luby, Frohman, Grisell, Lenzo, & Gottlieb, 1960; Pilcher & Huffcutt, 1996). There are many physical consequences of sleep loss. Deprived of sleep for varying lengths of time, healthy adults may suffer from gastrointestinal upset, visual changes, large and fine motor disruptions, changes in hormone regulation, and both mild and serious neural difficulties (Baumgartner et al., 1993; Chen & Tang, 1989; Dinges et al., 1997; Fountain, Kim, & Lee, 1998; Lal et al., 1997; Landis, Savage, Lentz, & Brengelmann, 1997; Morriss, Wearden, & Battersby, 1997; Mullington, Hermann, Holsboer, & Pollmacher, 1996; Phillips, Cooper, & Burke, 1987; Rogers et al., 1995; Seifritz et al., 1997). Disrupted sleep also may adversely affect the immune system (Irwin et al., 1994; Irwin et al., 1996; Palmlblad, Petrini, Wasserman, & Akerstedt, 1979). Reduced efficacy of the respiratory system, including weakening muscles and reduced air movement, have been documented following sleep loss (Chen & Tang, 1989; Cooper & Phillips, 1982; Meurice, Marc, & Series, 1995; Phillips et al., 1987; Schiffman, Trontell, Mazar, & Edelman, 1983; Series, Roy, & Marc, 1994; White, Douglas, Pickett, Swilich, & Weil, 1983). Finally, any adult experiencing infection and fever may be particularly affected by the disrupted thermoregulation that follows sleep disruptions (Landis et al., 1997).

Many healthy adults also are familiar with the mental and emotional consequences of sleep disturbances. Disrupted sleep may lead to depression, weepiness and emotional lability, loss of anger control, difficulty processing logical functions (e.g., math problems), and experiencing illusions (Aeschbach, Cajochen, Landolt, & Borbely, 1996; Dinges et al., 1997; Hill, Welch, & Godfrey III, 1995; Lorenzo et al., 1995; Morriss et al., 1997; Pilcher & Huffcutt, 1996; Richardson et al., 1996). In healthy volunteers, mental and emotional difficulties following sleep deprivation are transient, yet represent abnormalities that are uncomfortable for the individual (and for those around him or her) (Chokroverty, 1999). Such mental and emotional difficulties may at least affect the ability to participate meaningfully in his or her own life activities. At worst, mental and emotional difficulties following disrupted sleep represent suffering and distress.

SLEEP AND BEREAVEMENT

Sleep disturbances affect a significant portion of the general population, ranging from 15% to 35% of healthy adults (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989; Kales, Kales, & Soldatos, 1982; Mant & Eyland, 1988). Beginning with the work of Lindemann (1944), sleep disturbances are frequently mentioned in the bereavement studies and reports that have since been published (Bowlby, 1980; Caserta, Lund, & Dimond, 1990; Clayton, Desmarais, & Winokur, 1968; Glick, Weiss, & Parkes, 1974; Hall & Irwin, 2001; Osterweis, Solomon, & Green, 1984; Shuchter & Zisook, 1993; Stroebe & Stroebe, 1987; Thompson, Breckenridge, Gallagher, & Peterson, 1984). Bereaved respondents often reported having difficulty falling asleep, staying asleep, waking too early, and/or increased use of sleep aid medications. In some studies sleep disturbances were among the most commonly experienced if not the most problematic of the physical symptoms that were published (Bowlby, 1980; Caserta et al., 1990; Clayton et al., 1968; Glick et al., 1974; Hall & Irwin, 2001; Osterweis et al., 1984; Shuchter & Zisook, 1993; Stroebe & Stroebe, 1987; Thompson et al., 1984). There is some evidence that sleep disruption is an indicator for either dysfunctional grief or complicated grief disorders (Horowitz et al., 1997; Jacobs, Mazure, & Prigerson, 2000; McDermott et al., 1997; Prigerson et al., 1995).

Although spousal loss has been suggested as one potential factor associated with sleep problems among older adults, the nature of the problem as well as its relationship with other commonly examined bereavement outcomes, has not been the primary focus of most bereavement studies. Some research and clinical reports suggest that sleep problems could be symptomatic of the presence of depression, stress, or anxiety, which may or may not be related to loss (Hall et al., 1997; Lankford, 1994; McDermott et al., 1997; Nakra, Grossberg, & Peck, 1991; Reynolds et al., 1992). The death of a husband or wife also can alter the surviving spouse's sleeping environment, which could precipitate difficulties with sleep, especially among those who are older (Nakra et al., 1991).

Understanding the prevalence of sleep disturbances among older bereaved spouses is important because the relationship of bereavement to sleep problems may become recursive (Hall & Irwin, 2001). As noted, prolonged periods of inadequate sleep can suppress the immune system's ability to fight infections and disease, can alter respiratory function, and can decrease thermoregulation. It also potentially impairs an individual's level of functioning and their capacity to effectively cope with stressors, including bereavement. Consequently, from a clinical perspective, sleep problems among the bereaved can be an indicator for underlying psychological and physiological difficulties that may require intervention and treatment (Hall & Irwin, 2001).

This study examines: 1) prevalence and pattern of reports of sleep disturbance over time in a group of recently bereaved adults aged 50 years and over; and 2) assesses the relationship between patterns of sleep disturbance and indicators of

bereavement over time. The following specific research questions guided this study:

1. What are the prevalence and patterns of reported sleep disturbance over time in a group of bereaved and non-bereaved adults aged 50 years and over?
2. What factors are most common among adults over age 50 who report having disturbed sleep, either episodically or consistently?
3. What is the relationship over time between patterns of sleep disturbance and global measures of bereavement adjustment (bereavement-related feelings and behaviors and depression)?

CLARIFICATION OF TERMS

For the purposes of this study, we focused on three components of sleep disturbances: presence or absence of difficulty sleeping, seeking help from a professional, and the frequency of occurrence of trouble sleeping. Presence or absence of difficulty sleeping was a judgment made by each respondent. People usually know when they are not sleeping well (exceptions include some few sleep difficulties that do not result in awakening or other noticeable symptoms). These self-reports of having sleep difficulty may be attributed to frequent awakenings, difficulty initiating sleep, sleep that is not deep and refreshing, or excessively early awakening.

Seeking help from a professional, for this study, indicated a quantitative self-assessment of the sleep disturbance as being from mild to disruptive enough of daily life that professional assistance was sought. Mild sleep disturbance may be noticed but not reported, dismissed as not worth mentioning to a health care professional. Moderate to excessive sleep disturbance is distressing enough to be noticed and reported to a health care professional.

Frequency of occurrence is a report of the repetitive nature of the disturbance, within a proscribed period of time. Symptoms of sleep disturbance increase as frequency increases and the effects of sleep disturbances are cumulative.

To achieve the goals of the study, the prevalence and pattern of sleep complaints over two years in a sample of widows and widowers, aged 50 and over, were compared to that reported by a matched sample. A comparison group was used in order to determine if sleep problems were more common or patterned differently in older adults experiencing spousal loss, compared to older adults in general reporting high levels of sleep disruption (Statment, 1990). To achieve the second goal, patterns of sleep difficulties were correlated to indicators of grief. These grief indicators were chosen based on a review of the literature and previous research regarding the more common indicators of bereavement adjustment.

METHODS

The data used in this report were part of a longitudinal descriptive study of spousal bereavement in later life that took place in the Salt Lake metropolitan area (The University of Utah Bereavement Study). Numerous reports were published from this data (cf. Lund et al., 1993), however, none focused on the prevalence of sleep disturbances among the participants or its correlates. Most of the studies published by others that examined the relationship between sleep problems and bereavement were either exploratory with small samples or were laboratory-based (Hall & Irwin, 2001). This data provided us with the opportunity to examine longitudinally the impact of spousal loss on sleep disturbances using a community-based sample of bereaved older adults and a matched comparison group of married nonbereaved controls. Although detailed descriptions of the study design have been published elsewhere (Lund, Caserta, & Dimond., 1989; Lund et al., 1993), features of the project most salient to this report are presented below.

Sample

Recently bereaved spouses aged 50 and over were identified through the use of local newspaper obituaries in order to complete the first interview or questionnaire as early as three weeks following the spouse's death. Official mortality data obtained later from the State Department of Health Statistics revealed that this procedure missed only 9% of the actual deaths for those in the same age category. No significant gender, age, or socioeconomic differences were found between those who had a published obituary and those who did not.

All potential bereaved participants ($N = 192$) were randomly assigned to either a home interview group ($N = 104$) or a mailed questionnaire group ($N = 88$) in order to test for an interview effect. No major interviewer effect was observed regarding most psychosocial bereavement outcomes (Caserta, Lund, & Dimond, 1985) but the two groups were treated separately for some of the analyses regarding sleep problems because of the differences in the number of sleep difficulties reported between the two bereaved samples. Due to the early assessment and the longitudinal design, 61% of the potential bereaved respondents refused to participate. The most common reasons for refusal were extreme busyness, extreme upset, poor health, and advice from adult children not to participate. A one-year follow-up telephone interview with a random sample of those who had refused to be in the study ($N = 111$) indicated that their self-reported health was slightly lower than those who had participated. They did not differ, however, in age, gender, socioeconomic status, perceived coping, perceived stress, and rate of remarriage. This does not suggest that the participants and the refusals were experiencing the bereavement process in the same way but that they were similar with respect to several important considerations.

Nonbereaved older adults were identified for the control group through the use of public voter registry data and were selected on the basis of sex, age, and

socioeconomic area of residence. In order to reduce the number of matching procedures, a matched nonbereaved person was selected only for each of the 104 bereaved respondents in the interview group. The refusal rate for this sample was 50% and the major reasons for refusal were busyness and lack of interest. The first two questionnaires for each of the nonbereaved participants were delivered by a research assistant according to the same procedures as those used for the mailed questionnaire group of bereaved participants. In both samples, the respondents completed them without the assistance of an interviewer and returned them by mail.

The mean age for the bereaved sample at the beginning of the study was 67.6 years ($SD = 8.2$), with a range of 50 to 93 years, and they had been married an average of 39.7 years ($SD = 13.6$). The majority was female (74%), white (97%), and had graduated from high school (78%). The mean age of the nonbereaved control participants was 66.8 years ($SD = 7.9$), with a range of 51 to 85 years, and they had been married an average of 38.1 years ($SD = 12.8$) at the time they entered the study. Similar to the bereaved sample, most were female (73%), white (99%), and had graduated from high school (78%).

Procedures

All of the 192 bereaved persons were interviewed (BI) or completed questionnaires (BC) at six times during the first two years of bereavement: three to four weeks (T_1), two months (T_2), six months, (T_3), one year (T_4), 18 months (T_5), and two years (T_6) after the death. With the exception of the demographic variables, all six questionnaires were essentially the same. The survey instruments took approximately 1.5 to 2 hours to complete. The 104 nonbereaved controls completed similar questionnaires at the same six times. Because their questionnaires did not include the items pertaining to specific aspects of bereavement (e.g., cause of death, coping, etc.), they required only 45 minutes to complete them. While the bereaved interview participants and bereaved controls had different data completion strategies, most of our research reports have not found significant differences between the groups. In most cases, we have combined them into one bereaved sample.

Measures

In addition to demographic data, the respondents were asked at each data point questions about sleep problems, grief related feelings and behaviors, and completed a standardized scale that measured depression. Baseline health data also were collected, including the number of chronic conditions and medications taken on a regular basis as well as an item in which the respondents rated their health on a scale ranging from 1 (poor) to 7 (excellent).

Sleep Items

Three sleep variables were extracted from the larger data set to reflect the conceptual definitions of the terms presence or absence of difficulty sleeping, seeking help from a professional, and the frequency of occurrence of the disorder. The first two, labeled *difficulty* and *MD visit*, respectively, were taken from a two-part question on a health and illness symptom scale. The first part of the question asked the respondent if he/she “has had difficulty sleeping during the past several weeks?” (1 = yes, 0 = no), and the follow-up question asked if he/she “has visited a doctor for this problem?” (1 = yes, 0 = no).

The third sleep variable, a measure of the frequency of occurrence of the sleep disorder, labeled *frequency*, was a specific question on the Zung Depression Scale (Zung, 1965). This question asked the respondent if he/she “has trouble sleeping at night?” Five response categories were possible but our coding procedures followed the recommendation of the scale authors by scoring “never” and “a little of the time” as the same response; therefore, only four responses are coded on a 1-4 scale: (Never = 1, A little of the time = 1, Some of the time = 2, Good part of the time = 3, Most of the time = 4).

Bereavement-Related Feelings and Behaviors

Those in the bereaved samples were asked to indicate to what extent they experienced both the presence and intensity of 26 bereavement related feelings. Their responses were recorded on a 5-point Likert scale from “never had” (1) to “very strong” (5). A series of 16 bereavement-related behaviors also were presented in a similar Likert format with response categories ranging from “never did this” (1) to “most of the time” (5). Items included on these two checklists were generated primarily from the classic Harvard bereavement study (Glick et al., 1974). The items ranged from such early grief characteristics as shock, confusion, crying, and a review of the death event, to other experiences that might include confidence, pride, learning to do new things, and making new friends. In addition to these checklists, each questionnaire obtained self-reported ratings for perceived stress, coping ability and self-esteem measured by 7-point single-item statements. To make all these unstandardized measures more meaningful and statistically more manageable, they were factor analyzed into five global scales (see Caserta et al., 1985, for a detailed description of the item-factor loadings.) The five global scales and their corresponding alpha coefficients are: emotional shock (.82); helplessness/avoidance (.77); psychological strength and coping (.78); anger/guilt/confusion (.66); and grief-related behaviors (.64). The possible ranges for each scale are as follows: emotional shock (9-47); helplessness/avoidance (9-45); psychological strength and coping (7-39); anger/guilt/confusion (6-30); and grief-related behaviors (7-35). In each instance a higher score represents a greater level of the bereavement-related response being measured.

Depression

Depression was measured using the Zung (1965) Self-Rating Scale, which consists of 20 items scored in a Likert format ranging, from 1 to 4 where a higher rating indicates a more depressive response. The item pertaining to “having trouble sleeping at night” was omitted from the total score in this report so the possible total score for any respondent ranged from 19 to 76. This item was omitted because our analyses examine sleep as both an independent and dependent variable. We could not use sleep as an indicator of depression and as a cause.

This depression scale was used widely with older populations at the time the data for this study were gathered (Kitchell, Barnes, Veith, Okimoto, & Raskind, 1982). We acknowledge that a greater variety of depression scales have since been developed but are confident that the Zung (1965) scale has sufficient psychometric properties for the purposes of this study. It continues to be used in studies using older samples although it is understood that the presence of items inquiring into somatic complaints could overestimate the prevalence of depressive symptoms (Kane & Kane, 2000). In this study, however, it was not our intent to discriminate between those who were clinically depressed and those who were not, but to treat the measure as one of several indicators of bereavement adjustment.

RESULTS

To answer the first research question regarding prevalence of self-reported sleep disturbances in bereaved adults, all sleep items were subjected to descriptive analysis (Table 1). These analyses show how the participants in each of the three study groups (bereaved interview, bereaved controls, and nonbereaved controls) varied on each of the sleep measures at all six time periods. Although the number of bereaved interview, bereaved survey, and control were 104, 88, and 104 respectively, data are missing on individual items in a sporadic fashion, thus the *N* used for the denominator in the calculation of the percent varies over time for each group and may differ across each variable.

The bereaved interview group reported significantly more difficulty sleeping, (56.7%) at Time 1 than did the bereaved (43.4%) and nonbereaved (38.6%) controls. At all other time points, the percentage of subjects in any group reporting difficulty sleeping did not fall below 38.6% (nonbereaved control Time 1) and was as high as 62.7% (bereaved interview Time 5). There were no significant differences between the three study groups, even though the bereaved participants had higher percentages of difficulty sleeping than did the nonbereaved controls. For all subjects reporting difficulty sleeping, the percentage ranged from 46.1% at Time 2 to 54.5% at Time 5.

Among those subjects reporting difficulty sleeping, the bereaved interview group reported significantly more visits to an MD for difficulty sleeping at Time 3 (41.4%) and at Time 4 (52.2%) than did the bereaved and nonbereaved controls.

Table 1. Prevalence of Difficulty Sleeping and Visiting an MD for Help, and Frequency of Occurrence of Sleep Disorders Over Time

Variables/group	3-4 Weeks N (%)	2 Months N (%)	6 Months N (%)	1 Year N (%)	18 Months N (%)	2 Years N (%)
Difficulty sleeping^a						
Bereaved interview	55 (56.7)*	41 (47.1)	45 (54.9)	40 (49.4)	47 (62.70)	37 (48.7)
Bereaved controls	36 (43.4)	38 (50.0)	38 (53.5)	33 (46.5)	38 (53.5)	29 (47.5)
Nonbereaved	39 (38.6)	40 (42.1)	44 (50.0)	42 (46.2)	42 (48.3)	40 (47.10)
Total	130 (46.3)	119 (46.1)	127 (52.7)	115 (47.3)	127 (54.5)	106 (47.7)
MD visit^a						
Bereaved interview	11 (23.4)	5 (17.2)	12 (41.4)*	12 (52.2)**	13 (44.8)	8 (36.4)
Bereaved controls	4 (11.4)	4 (20.0)	5 (26.3)	2 (11.8)	6 (35.3)	3 (17.6)
Nonbereaved	5 (12.8)	3 (12.0)	3 (12.0)	4 (14.3)	4 (16.0)	3 (11.5)
Total	20 (16.5)	12 (16.2)	20 (27.4)	18 (26.5)	23 (32.4)	14 (21.5)
Frequency^b						
<i>Bereaved interview</i>						
Never or little of time	6 (12.6)	15 (34.1)	16 (37.2)	19 (46.3)	11 (29.7)	15 (39.5)
Some of the time	14 (29.8)	11 (25.0)	11 (25.6)	12 (29.3)	16 (43.2)	9 (23.7)
Good part of the time	13 (27.7)	8 (18.2)	8 (18.6)	3 (7.3)	3 (8.1)	5 (13.2)
Most of the time	14 (29.8)	10 (22.7)	8 (18.6)	7 (17.1)	7 (18.9)	9 (23.7)

<i>Bereaved controls</i>						
Never or little of time	5 (14.7)	10 (33.3)	8 (32.0)	13 (44.8)	14 (53.8)*	11 (44.0)
Some of the time	16 (47.1)	12 (40.0)	11 (44.0)	10 (34.5)	7 (26.9)	8 (32.0)
Good part of the time	6 (17.6)	3 (10.0)	3 (12.0)	3 (10.3)	5 (19.2)	5 (20.0)
Most of the time	7 (20.6)	5 (16.7)	3 (12.0)	3 (10.3)	0 (0)	1 (4.0)
<i>Nonbereaved</i>						
Never or little of time	10 (25.6)	9 (23.7)	12 (34.3)	9 (25.7)	11 (31.4)	9 (26.5)
Some of the time	13 (33.3)	14 (36.8)	8 (22.9)	9 (25.7)	9 (25.7)	10 (29.4)
Good part of the time	10 (25.6)	12 (31.6)	12 (34.3)	12 (34.3)*	9 (25.7)	8 (23.5)
Most of the time	6 (15.4)	3 (7.9)	3 (8.6)	5 (14.3)	6 (17.1)	7 (20.6)

^aReporting "Yes." ^bThe frequency item was coded with four possible responses, as recommended by scale authors, thus Never = 1, A little of the time = 2, Some of the time = 3, and Most of the time = 4.

* $p \leq .05$ (according to Chi-square tests). ** $p \leq .005$ (according to Chi-square tests).

At all other time points, the percentage of subjects in any group reporting visits to an MD for difficulty sleeping did not fall below 11.4% (bereaved control Time 1). For all subjects reporting difficulty sleeping, the percentage reporting a visit to an MD for this problem ranged from 16.2% at Time 2 to 32.4% at Time 5.

Both the bereaved interview and bereaved control groups reported the highest frequency of trouble sleeping at Time 1 (29.8% and 20.6%, respectively). Numbers of those reporting trouble sleeping a good part or most of the time drop off over time, so that at Time 5 a significant percentage of bereaved control subjects (53.8%) reported trouble sleeping never or a little of the time. However, trouble sleeping remained a frequent problem for a number of respondents regardless of bereavement status (group membership), such that at Time 4 a significant percentage of nonbereaved control subjects reported trouble sleeping a good part of the time (34.3%).

In an attempt to determine patterns of sleep disturbance over time, data for difficulty sleeping, a dichotomous variable reported as “yes” or “no,” was analyzed on the basis of time, using Chi-square (Table 2). Data from Times 1, 2, or 3 were classified as “early” and data from Times 4, 5, or 6 were classified as “late.” Thus, each subject could have a score for early difficulty sleeping ranging from 0 (never reported difficulty sleeping at early time points) to 3 (reported difficulty sleeping at each early time point). Similarly, each subject could have a score for late difficulty sleeping ranging from 0, no reports, to 3, reports at each late time point.

Results showed three clear patterns of sleep. The most common pattern, reported by 114 subjects (45.4% of the total sample), was Pattern 1, no or little difficulty sleeping either early or late. Pattern 1 was indicated by scores of 0 or 1, both early and late. The next most common pattern, reported by 84 subjects

Table 2. Prevalence of Difficulty Sleeping among Elderly Reported Early in the Study Compared to Late in the Study

	3 weeks to 6 months (early)				
	No difficulty <i>N</i> (%)	Difficulty once <i>N</i> (%)	Difficulty twice <i>N</i> (%)	Difficulty thrice <i>N</i> (%)	Total <i>N</i> (%)
12 to 24 months (late)					
No difficulty	60 (23.9)	26 (10.3)	4 (1.6)	3 (1.2)	93 (37.1)
Difficulty once	11 (4.4)	17 (6.8)	10 (4.0)	5 (2.0)	43 (17.1)
Difficulty twice	4 (1.6)	11 (4.4)	12 (4.8)	13 (5.2)	40 (15.9)
Difficulty thrice	4 (1.6)	12 (4.8)	26 (10.4)	33 (13.2)	75 (29.9)
Total	79 (31.5)	66 (26.3)	52 (20.7)	54 (21.5)	251 (100.0)

Note: Pearson Chi-square value = 110.1, $p < .000$.

(33.5% of the sample), was Pattern 2, difficulty sleeping both early and late. Pattern 2 was indicated by scores of 2 or 3, both early and late. The differences between distributions in Patterns 1 and 2 were significant at a p -value of less than .0001.

A smaller number of 53 subjects (21%) experienced episodic difficulty over time in varying ways, indicated by early scores of 0 or 1 combined with late scores of 2 or 3 (31 subjects), and early scores of 2 or 3 combined with late scores of 0 or 1 (22 subjects). The disorganization and variance of the sleep of these subjects contrasted conceptually with the more fixed, long-term sleep patterns seen in Patterns 1 and 2. Since the effects of sleep difficulty are cumulative and symptoms of sleep deprivation increase with the frequency of occurrence, we decided to combine those with episodic sleep difficulties (early problems but not later or later problems but not early) into one group rather than separating them into two different groups. We refer to these persons in Pattern 3 as "episodic pattern." Combining these two subtypes into one group allowed us to maintain our analysis focus on comparing those with clear established sleep patterns with those who have more episodically disorganized sleep.

In order to describe the elderly adult experiencing either Pattern 1, 2, or 3 type of sleep disturbance during bereavement, patterns of difficulty sleeping were subjected to group analysis, again using Chi square. There were no differences in patterns of difficulty sleeping on the basis of bereavement. Bereaved (both interview and control) and nonbereaved control respondents were proportionately distributed across all patterns, thus we combined bereaved interview and control groups for subsequent analysis. Specifically, subjects with no or little difficulty with early sleep tended to report no or little difficulty with late sleep, regardless of bereavement status, and subjects with early difficulty sleeping also tended to report later difficulty sleeping, regardless of bereavement status. However, when patterns of difficulty sleeping were analyzed to help identify early indicators of problems on the basis of socio-demographic variables measured at Time 1, significant differences were found on the basis of sex with females having more difficulty than men (Chi square = 18.31, $p < .000$), age with older adults having more difficulty than younger persons ($F = 4.96$, $p < .008$), health rating at Time 1 with adults in poor health having more difficulty than adults in good health (Chi square 23.49, $p < .000$), and number of medications taken at Time 1 with adults taking more medications having more difficulty than adults taking fewer medications (Chi square 11.14, $p < .004$). A trend toward significance was found on the basis of number of chronic illnesses found at Time 1 with adults reporting more chronic illnesses having more difficulty sleeping than adults with fewer chronic illnesses (Chi square = 5.02, $p < .081$). Therefore, those experiencing the greatest difficulty sleeping were those who were older, female, in poorer health, and taking more medications.

Research question three examined the relationship over time between patterns of sleep disturbance and global measures of bereavement adjustment by using

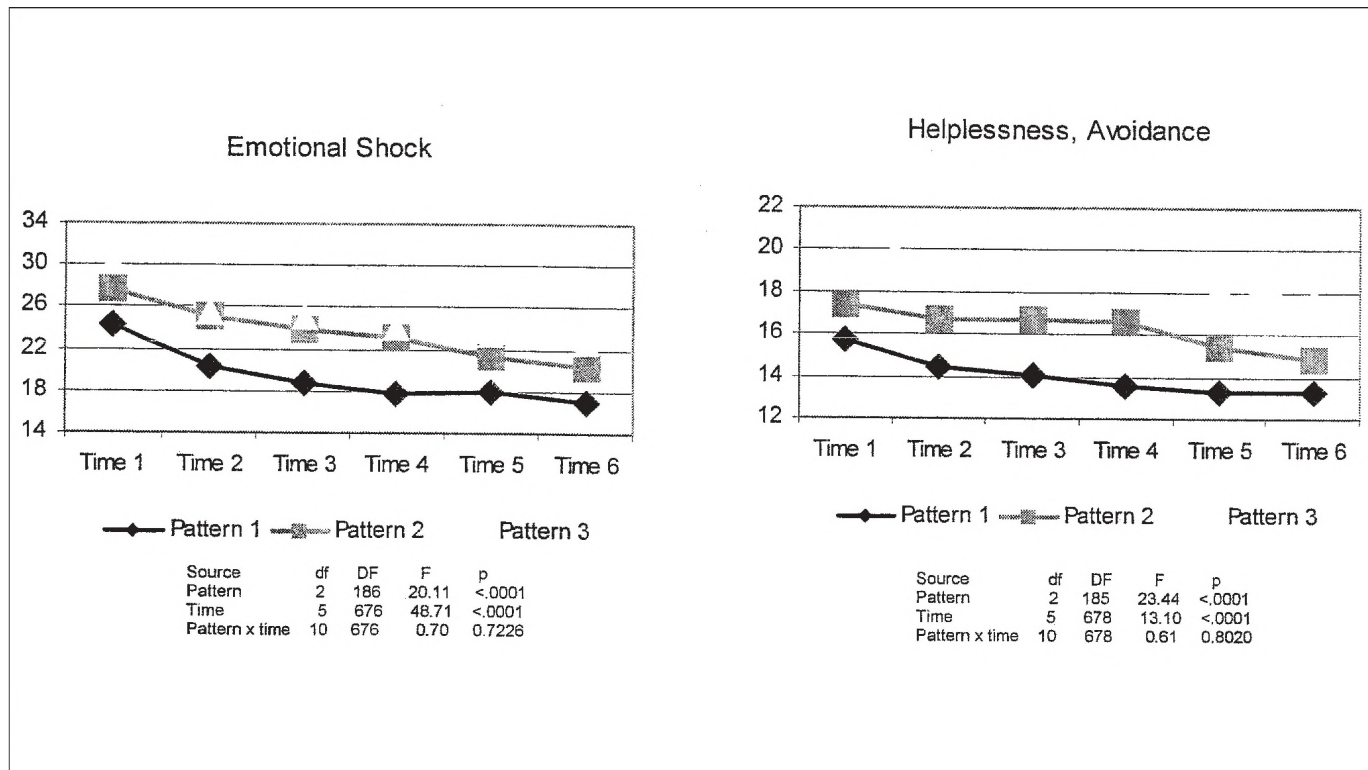


Figure 1. Repeated measures analysis of variance for patterns of sleep and emotional shock, helplessness/avoidance, self-esteem/coping, grief-related behaviors, anger/guilt/confusion, and depression.

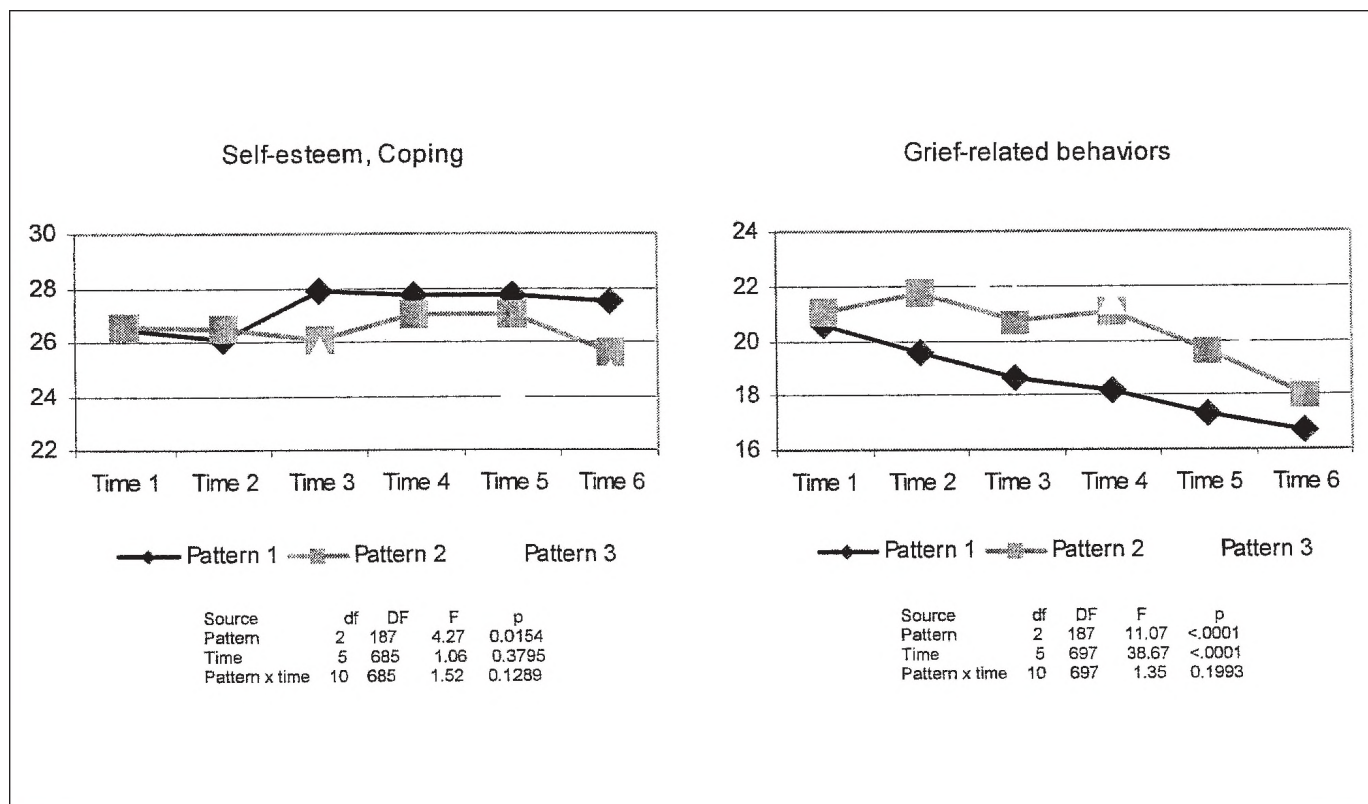


Figure 1. (Cont'd.)

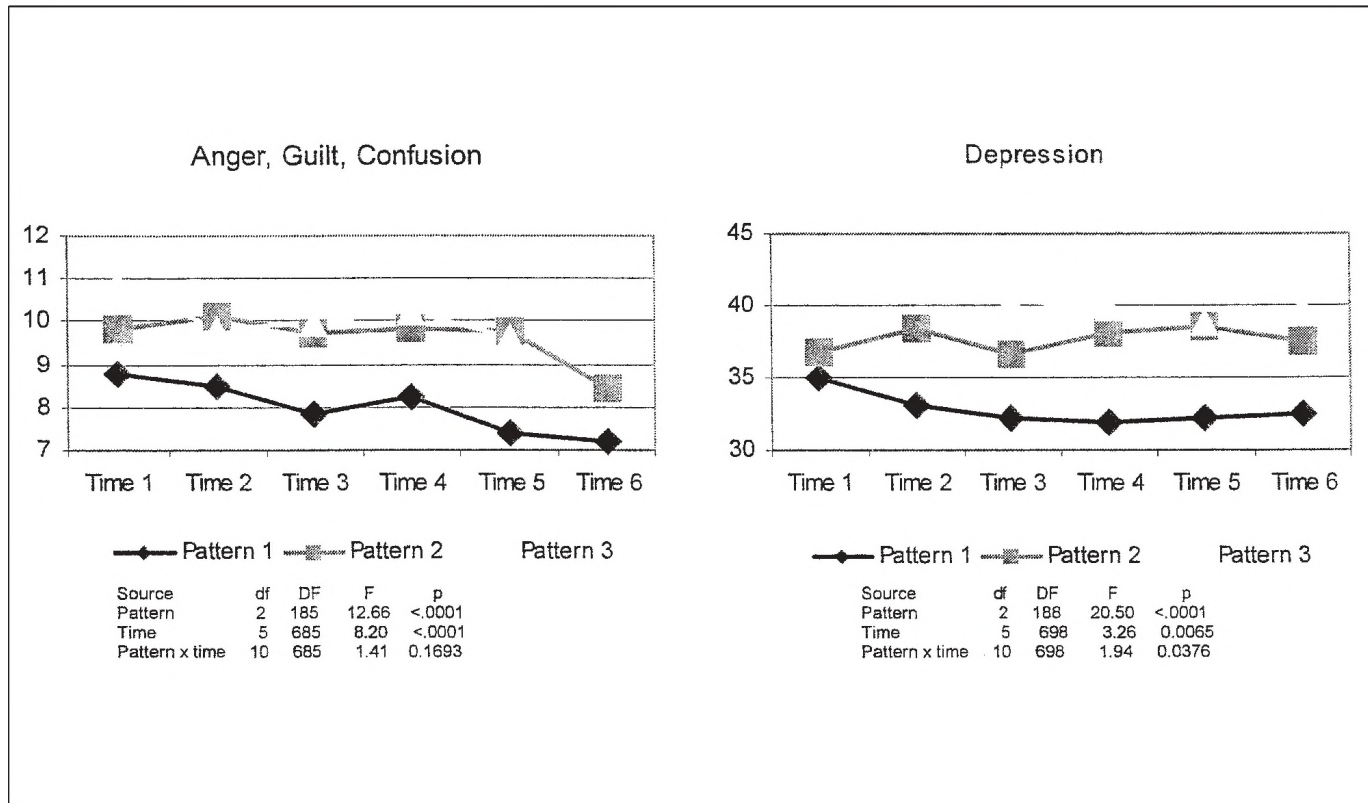


Figure 1. (Cont'd.)

a repeated measures ANOVA procedures (Figure 1). Specific global measures of bereavement adjustment included emotional shock, helplessness and avoidance, self-esteem and coping, grief-related behaviors, anger and guilt and confusion, and finally, depression. All relationships were in the expected direction with sleep being problematic in grief. On all six indicators, those with the least difficulty sleeping on a consistent basis (Pattern 1) had the most favorable bereavement outcomes through nearly every time period. Conversely, those with persistent sleep disturbance (Pattern 2) had the most negative scores over time (with only minor exceptions at some time periods) on all six bereavement outcome measures. While there were changes over time for most outcomes, the differences between the three groups persisted over time. Of all six outcome measures, the one that revealed the most distinct differences among the three groups was "Helplessness/Avoidance." This subscale may reflect feeling a lack of control that persists over time and includes not wanting to be among others (Lund, Caserta, & Dimond, 1986). Those with the greatest sleep difficulty may have been consistently troubled by feelings of helplessness and avoidance in the two years following bereavement.

DISCUSSION

What are the prevalence and patterns of reports of sleep disturbance over time in a group of bereaved and nonbereaved adults aged 50 years and over? About half of bereaved elderly subjects experienced sleep disruption in the initial (one month) period following their loss. These results are congruent with initial difficulty many bereaved adults have soon after the loss, and this percentage approximates the percentage of people, identified by other researchers, as having major difficulty coping with their grief, particularly in the early stages (Lund et al., 1993). A large portion of the elderly, bereaved or not, evidenced sleep difficulty at every time point, with approximately one-third of elderly adults experiencing ongoing sleep disruption, regardless of bereavement status. This high rate of sleep difficulty is similar to that found in multiple populations (Bliwise, 1994; Call-Schmidt & Richardson, 2003; Carskadon & Dement, 1994; Chokroverty, 1999; Hoch et al., 1997; Middlekoop et al., 1996; Richardson, 2003). Although bereavement by itself may not be associated with sleep difficulties, those who are bereaved and not sleeping, particularly elderly women in poor health, are at risk for impaired adjustment and all the negative consequences associated with grief and sleeplessness.

Over 10% of all elderly in this study reported consulting a physician for difficulty sleeping, regardless of bereavement status. Nonbereaved controls also reported difficulty sleeping, but were not seeing an MD for this, while bereaved interview and control respondents were reporting difficulty and only the bereaved interviews were seeking help from an MD. Bereaved persons may have assumed that everything they initially experienced as negative was grief-related. After one

year, however, they may have begun to understand that the real problem was sleep disturbance, and they consulted a physician for this. For the bereaved who visited a physician related to the care of their dying spouse, or for their own chronic conditions, seeing a physician for sleep difficulty may have been more acceptable, easier or less stigmatizing. Finally, some of the bereaved may have been burdened enough with their grief that difficulty sleeping became unbearable and they had to seek assistance.

What factors are most common among adults over age 50 who report having disturbed sleep, either episodically or consistently? Persons with consistent sleep disturbance tended to be female, older, with poor health, and were taking more medications. All these results were in the expected direction. Even with the small number of men in our sample, the study had sufficient power to confirm others' objective findings of increased sleep difficulty for women (Call-Schmidt & Richardson, 2003). The oldest respondents reported more sleep disturbance than did younger old adults, confirming others' findings about aging and sleep (Bliwise, 1994; Hayashi & Endo, 1982; Hoch et al., 1997; Webb, 1982). The relationship between poor health and prolonged difficulty with sleep may be explained in part if one accepts that poor health may be a source of worry, as well as a source of symptoms that disrupt sleep. Increased numbers of medications may disrupt sleep through side effects, as all medications have side effects. While some medications (histamine blockers, beta blockers, and calcium channel blockers, to name only a few) can cause drowsiness and sleepiness, others (e.g., theophylline) increase arousal. Further, taking greater numbers of medications increases the likelihood that one would need to get up in the night to take a scheduled medication, or deal with the expected effects of the medication (e.g., diuresis). Finally, the relationship between stress and disrupted sleep is a common experience, possibly due simply to stress-mediated neurotransmitter release, resulting in increased wakefulness while stressed.

What is the relationship over time between patterns of sleep disturbance and global measures of bereavement adjustment (bereavement-related feelings and behaviors)? Persons with consistent sleep disturbance showed statistically significant differences in grief outcomes that persisted over time. Apparently, if one has an established pattern of poor sleep, adjustment to grief takes longer and will be associated with a less favorable process. It is possible that the effects of prolonged difficulty sleeping are cumulative and additive, affecting grief outcomes as well as health.

Implications for practice are, at this point, fairly straightforward. Findings suggest that the elderly female in poor health and taking multiple medications is at risk for difficulty adjusting to bereavement particularly if they report chronic difficulty sleeping. Patients fitting this profile should be carefully assessed upon bereavement for their chronic sleep pattern. Improving sleep in the elderly bereaved may be accomplished with a combination of short-term medication therapy and longer-term cognitive-behavioral sleep counseling (Montgomery,

2002). Finally, while our study used spousal bereavement as the model for grief, other losses, such as the death of a pet, grandchild, or friend, a change in work status, loss of independent living, and sensory loss can also precipitate grieving and should be assessed for at each patient-provider contact.

SUGGESTIONS FOR FUTURE RESEARCH

In terms of future research, we suggest that investigations focused on bereavement adjustments include measures of sleep difficulty. We need more in-depth assessments of how these adjustments can be impacted by sleep difficulties. And while we focused on patterns of sleep, future research might explore the relationship between sleep and grief in persons with no established pattern of sleep over time, with more power. There are promising ways to facilitate healthier sleep that could be included in the more traditional grief, bereavement, and widowhood interventions. Future intervention studies might be made more effective by broadening the multidimensional view of the long-term adjustment process so that more daily-life indicators such as sleep patterns and difficulties are included.

REFERENCES

- Aeschbach, D., Cajochen, C., Landolt, H., & Borbely, A. (1996). Homeostatic sleep regulation in habitual short sleepers and long sleepers. *American Journal of Physiology*, 270(1, pt. 2), R41-R53.
- Baumgartner, A., Dietzel, M., Saletu, B., Wolf, R., Campos-Barros, A., Graf, K. J., Kurten, I., & Mannsmann, U. (1993). Influence of partial sleep deprivation on the secretion of thyrotropin, thyroid hormones, growth hormone, prolactin, lutenizing hormone, follicle stimulating hormone, and estradiol in healthy young women. *Psychiatry Research*, 48(2), 153-178.
- Bliwise, D. L. (1994). Normal aging. M. Kryger, T. Roth, & W. Dement (Eds.), *Principles and practice of sleep medicine* (2nd ed., pp. 26-39). Philadelphia: W. B. Saunders.
- Bowlby, J. (1980). *Attachment and loss: Sadness, and depression, Volume 3*. New York: Basic Books.
- Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatric Research*, 28(2), 193-213.
- Call-Schmidt, T., & Richardson, S. (2003). Prevalence of sleep disturbance and its relationship to pain in adults with chronic pain. *Pain Management Nursing*, 4(3), 124-133.
- Carskadon, M. A., & Dement, W. C. (1994). Normal human sleep: An overview. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (pp. 16-25). Philadelphia: W. B. Saunders.
- Caserta, M. S., Lund, D. A., & Dimond, M. F. (1985). Assessing interviewer effects in a longitudinal study of bereaved elderly adults. *Journal of Gerontology*, 40, 637-640.

Caserta, M. S., Lund, D. A., & Dimond, M. F. (1990). Understanding the context of perceived health ratings: The case of spousal bereavement in later life. *Journal of Aging Studies, 4*, 231-243.

Chen, H., & Tang, Y. (1989). Sleep loss impairs inspiratory muscle endurance. *American Review of Respiratory Disease, 140*(4), 907-909.

Chokroverty, S. (1999). An overview of sleep. In S. Chokroverty (Ed.), *Sleep disorders medicine: Basic science, technical considerations, and clinical aspects* (2nd ed., pp. 7-20). Boston: Butterworth Heinemann.

Clayton, P., Desmarais, L., & Winokur, G. (1968). A study of normal bereavement. *American Journal of Psychiatry, 125*, 64-74.

Cooper, K. R., & Phillips, B. A. (1982). Effect of short-term sleep loss on breathing. *Journal of Applied Physiology, 53*, 855-858.

Dinges, D. F., Pack, F., Williams, K., Gillen, K. A., Powell, J. W., Ott, G. E., Aptowicz, C., & Pack, A. I. (1997). Cumulative sleepiness, mood disturbance, and psychomotor vigilance performance decrements during a week of sleep restricted to 4-5 hours per night. *Sleep, 20*(4), 267-277.

Fountain, N., Kim, J., & Lee, S. (1998). Sleep deprivation activates epileptiform discharges independent of the activating effects of sleep. *Journal of Clinical Neurophysiology, 15*(1), 69-75.

Glick, I. O., Weiss, R. S., & Parkes, C. M. (1974). *The first year of bereavement*. New York: John Wiley & Sons.

Hall, M., Buysse, D. J., Dew, M. A., Prigerson, H. G., Kupfer, D. J., & Reynolds, C. F. (1997). Intrusive thoughts and avoidance behaviors are associated with sleep disturbances in bereavement-related depression. *Depression and Anxiety, 6*, 106-112.

Hall, M., & Irwin, M. (2001). Physiological indices of functioning in bereavement. In M. S. Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement: Consequences, coping, and care* (pp. 473-492). Washington, DC: American Psychological Association.

Hayashi, Y., & Endo, S. (1982). All-night sleep polygraphic recordings of healthy aged persons: REM and slow wave sleep. *Sleep, 5*(3), 277-283.

Hill, D. W., Welch, J. E., & Godfrey, III, J. A. (1995). Influence of locus of control on mood state disturbance after short-term sleep deprivation. *Sleep, 19*(1), 41-46.

Hoch, C., Dew, M., Reynolds, C., Buysse, D., Nowell, P., Monk, T., Mazumdar, S., Borland, M., Miewald, J., & Kupfer, D. (1997). Longitudinal changes in diary- and laboratory-based sleep measures in healthy "old old" and "young-old" subjects: A three-year follow up. *Sleep, 20*(3), 192-202.

Horne, J. A. (1985). Sleep function, with particular reference to sleep deprivation. *Annals of Clinical Research, 17*, 199-208.

Horowitz, M. J., Siegel, B., Hoen, A., Bonanno, G. A., Milbrath, C., & Stinson, C. H. (1997). Diagnostic criteria for complicated grief disorder. *American Journal of Psychiatry, 154*(7), 904-908.

Irwin, M., Masgovich, A., Gillin, J. C., Willoughby, R., Pike, J., & Smith, T. L. (1994). Partial sleep deprivation reduces natural killer cell activity in humans. *Psychosomatic Medicine, 56*, 493-498.

Irwin, M., McClintick, J., Costlow, C., Fortner, M., White, J., & Gillin, J. (1996). Partial night sleep deprivation reduces natural killer and cellular immune responses in humans. *FASEB Journal, 10*(5), 643-653.

- Jacobs, S., Mazure, C., & Prigerson, H. (2000). Diagnostic criteria for traumatic grief. *Death Studies, 24*, 185-199.
- Kales, A., Kales, J. D., & Soldatos, C. R. (1982). Insomnia and other sleep disorders. *Medical Clinics of North America, 66*(5), 971-988.
- Kane, R. L., & Kane, R. A. (2000). *Assessing older persons: Measures, meaning, and practical applications*. New York: Oxford University Press.
- Kitchell, M. A., Barnes, R. F., Veith, R. C., Okimoto, J. T., & Raskind, M. A. (1982). Screening for depression in hospitalized geriatric medical patients. *Journal of the American Geriatrics Society, 30*, 174-177.
- Lal, S., Thavundayil, J., Krishnan, B., Nair, N., Schwartz, G., Kiely, M., & Guyda, H. (1997). Effect of sleep deprivation on the growth hormone response to the alpha-2 adrenergic receptor agonist, clonidine, in normal subjects. *Journal of Neural Transmission, 104*(2-3), 291-298.
- Landis, C., Savage, M., Lentz, M., & Brengelmann, G. (1997). Sleep deprivation alters body temperature dynamics to mild cooling and heating not sweating threshold in women. *Sleep, 21*, 101-108.
- Lankford, S. (1994). Sleep loss in the elderly: Understanding the reasons. *Journal of Gerontological Nursing, 20*(8), 49-52.
- Lindemann, E. (1944). Symptomatology and management of acute grief. *American Journal of Psychiatry, 101*, 141-148.
- Lorenzo, I., Ramos, J., Arce, C., Guevera, M. A., & Corsi-Cabrera, M. (1995). Effect of total sleep deprivation on reaction time and waking EEG activity in man. *Sleep, 18*(5), 346-354.
- Luby, E. D., Frohman, C. E., Grisell, J. L., Lenzo, J. E., & Gottlieb, J. S. (1960). Sleep deprivation: Effects on behavior, thinking, motor performance and biological energy transfer systems. *Psychosomatic Medicine, 22*(3), 249-254.
- Lund, D. A., Caserta, M. S., & Dimond, M. F. (1986). Gender differences through two years of bereavement among the elderly. *Gerontologist, 26*(3), 314-320.
- Lund, D. A., Caserta, M. S., & Dimond, M. F. (1989). Impact of spousal bereavement on the subjective well-being of older adults. In D. A. Lund (Ed.), *Older bereaved spouses: Research with practical applications* (pp. 3-15). New York: Taylor & Francis/ Hemisphere.
- Lund, D. A., Caserta, M. S., & Dimond, M. F. (1993). The course of spousal bereavement in later life. In M. S. Stroebe, W. Stroebe, & R. O. Hansson (Eds.), *Handbook of bereavement: Theory, research, and intervention* (pp. 240-254). New York: Cambridge University Press.
- Mant, A., & Eyland, E. A. (1988). Sleep patterns and problems in elderly general practice attendees: An Australian survey. *Community Health Studies, 12*(2), 192-199.
- McDermott, O., Prigerson, H., Reynolds, C-R., Houck, P., Dew, M., Hall, M., Mazumdar, S., Buysse, D. J., Hoch, C. C., & Kupfer, D. J. (1997). Sleep in the wake of complicated grief symptoms: An exploratory study. *Biol-Psychiatry, 41*(6), 710-716.
- Meurice, J., Marc, I., & Series, F. (1995). Influence of sleep on ventilatory and upper airway response to CO₂ in normal subjects and patients with COPD. *American Journal of Respiratory and Critical Care Medicine, 152*(5), 1620-1626.
- Middlekoop, H., Smilde-van den Doel, D., Neven, A., Kamphuisen, H., & Springer, C. (1996). Subjective sleep characteristics of 1,485 males and females aged 50-93: Effects of sex and age, and factors related to self-evaluated quality of sleep. *Journal of Gerontology Series A Biologic Sciences and Medical Sciences, 51*(3), M108-M115.

Montgomery, P. (2002). Treatments for sleep problems in elderly people. *British Medical Journal*, *325*, 1049.

Morriss, R. K., Wearden, A. J., & Battersby, L. (1997). The relation of sleep difficulties to fatigue, mood and disability in chronic fatigue syndrome. *Journal of Psychosomatic Research*, *42*(6), 597-605.

Mullington, J., Hermann, D., Holsboer, F., & Pollmacher, T. (1996). Age-dependent suppression of nocturnal growth hormone levels during sleep deprivation. *Neuroendocrinology*, *64*(3), 233-241.

Nakra, B. R. S., Grossberg, G. T., & Peck, B. (1991). Insomnia in the elderly. *American Family Physician*, *43*, 477-483.

Osterweis, M., Solomon, F., & Green, M. (1984). *Bereavement: Reactions, consequences, and care*. Washington, DC: National Academy Press.

Palmblad, J., Petrini, B., Wasserman, J., & Akerstedt, T. (1979). Lymphocyte and granulocyte reactions during sleep deprivation. *Psychosomatic Medicine*, *41*, 273-278.

Phillips, B. A., Cooper, K. R., & Burke, T. B. (1987). The effect of sleep loss on breathing in chronic obstructive pulmonary disease. *Chest*, *91*(1), 29-32.

Pilcher, J. J., & Huffcutt, A. I. (1996). Effects of sleep deprivation on performance: A meta-analysis. *Sleep*, *19*(4), 318-326.

Prigerson, H. G., Frank, E., Kasl, S. V., Reynolds, C. F., Anderson, B., & Zubenko, G. S., Houck, P. R., Geroge, C. J., & Kupfer, D. J. (1995). Complicated grief and bereavement-related depression as distinct disorders: Preliminary empirical validation in elderly bereaved spouses. *American Journal of Psychiatry*, *152*(1), 22-30.

Reynolds, C. F., Hoch, C. C., Buysse, D. J., Houck, P. R., Schlermitzauer, M., Frank, E., Mazumdar, S., & Kupfer, D. J. (1992). Electroencephalographic sleep in spousal bereavement and bereavement-related depression in late life. *Biological Psychiatry*, *34*, 69-82.

Richardson, G. S., Wyatt, J. K., Sullivan, J. P., Orav, E. J., Ward, A. E., Wolf, M. A., & Czeisler, C. A. (1996). Objective assessment of sleep and alertness in medical house staff and the impact of protected time for sleep. *Sleep*, *19*(9), 718-726.

Richardson, S. J. (2003). The effects of relaxation and imagery on perceived sleep in critically ill adults. *Dimensions of Critical Care Nursing*, *22*(4): 182-190.

Rogers, C., Paterson, D., Cunningham, D., Noble, E., Pettigrew, F., Myles, W., & Taylor, A. (1995). Sleep deprivation: Effects on work capacity, self-paced walking, contractile properties and perceived exertion. *Sleep*, *18*(1), 30-38.

Schiffman, P. L., Trontell, M. C., Mazar, M. F., & Edelman, N. H. (1983). Sleep deprivation decreases ventilatory response to CO₂ but not load compensation. *Chest*, *84*(6), 695-698.

Seifritz, E., Muller, M., Annen, O., Nil, R., Hatzinger, M., Hemmeter, U., Moore, P., & Holsboer-Trachsler, E. (1997). Effect of sleep deprivation on neuroendocrine response to a serotonergic probe in healthy male subjects. *Journal of Psychiatric Research*, *31*(5), 543-554.

Series, F., Roy, N., & Marc, I. (1994). Effects of sleep deprivation and sleep fragmentation on upper airway collapsibility in normal subjects. *American Journal of Respiratory and Critical Care Medicine*, *150*(2), 481-485.

Shuchter, S. R., & Zisook, S. (1993). The course of normal grief. In M. S. Stroebe & W. Stroebe, & R. O. Hansson (Eds.), *Handbook of bereavement: Theory, research and intervention* (pp. 23-43). New York: Cambridge University Press.

Statement, N. C. (1990). The treatment of sleep disorders of older people. *NIH Consensus Development Conference*, 8 1-21.

Stroebe, W., & Stroebe, M. S. (1987). *Bereavement and health: The psychological and physical consequences of partner loss*. New York: Cambridge University Press.

Thompson, L. W., Breckenridge, J. N., Gallagher, D., & Peterson, J. (1984). Effects of bereavement on self-perceptions of physical health in elderly widows and widowers. *Journal of Gerontology*, 39, 309-314.

Webb, W. (1982). Sleep in older persons: Sleep structures of 50- to 60-year-old men and women. *Journal of Gerontology*, 37(5), 581-586.

White, D. P., Douglas, N. J., Pickett, C. K., Swilich, C. W., & Weil, J. V. (1983). Sleep deprivation and the control of ventilation. *American Review of Respiratory Disease*, 128, 984-986.

Zepelin, H., McDonald, C. S., & Zammit, G. K. (1984). Effects of age on auditory awakening thresholds. *Journal of Gerontology*, 37(5), 581-586.

Zung, W. (1965). A self-rating depression scale. *Archives of General Psychiatry*, 12, 3-70.

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