

# *The Effect of Widowhood on Weight Change, Dietary Intake, and Eating Behavior in the Elderly Population*

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**Objectives:** To assess the effect of recent widowhood on weight, dietary intake, and habits. **Methods:** Participants included 58 recently widowed elderly subjects and 58 married subjects who were matched on age, sex, and race. Weight change from baseline and following widowhood, dietary intake, eating behavior, depression, and cognitive and physical functioning were assessed in a clinic interview. **Results:** Mean weight loss and the prevalence of weight loss were significantly higher among widowed participants. They ate more meals alone, more commercial meals per week, and fewer snacks and homemade meals. They also enjoyed their eating less. A significant difference between cases and controls was evident after adjusting for all the variables. Higher cognitive functioning score, younger age, and better appetite were protective against weight loss. **Discussion:** Widowed people were found to be at increased risk for weight loss. This may well be due to decreased appetite and enjoyment of their meals.

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*Besides being an extremely painful life event* (Vachon, 1976), the loss of a spouse entails higher morbidity (Parkes, 1964a, 1964b) and mortality (Helsing, Moyers, & George, 1981). Maddison and Walker (1967) found a 20% incidence of major adverse health outcomes in the first year of widowhood. Parkes (1964b) found that widowed people



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consulted physicians at three times the expected rate during the first year of widowhood, and Vachon (1976) found that at the 13-month follow-up, 32% of widowed elders showed deterioration of health compared with 2% of the control elders. The mechanisms underlying the effect of widowhood on physical well-being are not fully established. Greenblat (1978), in his description of the grieving spouse, postulates that grief in itself could create a serious risk to physical health, whereas other researchers (James, Castle, & Makinodan, 1995; Lin, Simeone, Ensel, & Kuo, 1979) offer an immunological mechanism explanation. It is worth noting that besides the emotional loss, the long-lasting life routine is irreversibly changed, and self-care may be compromised.

While investigating the mechanisms by which widowhood contributes to physical illness, it is important not to leave out its nutritional impact. It is well-established that nutrition plays a major role in maintaining the health and longevity of elderly people. Studies show that elderly people are more likely than younger adults to be at marginal nutritional status (Bidlack, 1990; Bidlack & Wang, 1995; Carroll, Abraham, & Dresser, 1983; Morley, 1986) and that deterioration of nutritional status contributes to excess morbidity and mortality (Rauscher, 1993).

Weight loss was shown to be predictive of successive nutritional deterioration among older people (Chandra, Imbach, Moore, & Skelton, 1991). Recent weight loss may be a sensitive indicator of individuals at nutritional risk (Fogt, Bell, & Blackburn, 1995). In addition, older people who lose weight are less likely than younger people to gain it back (Fukagawa, Bandini, & Young, 1990; Roberts, Fuss, Heyman, Evans, & Tsay, 1994).

Newly widowed elders may be at nutritional risk via two mechanisms. One is the practical aspect of losing a partner in the task of food provision. The other is the profound grief reaction and its impact on self-care, self-feeding, and appetite. For most elders in developed countries, the onset of widowhood entails the disintegration of the

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family unit. Providing nutrition is typically a shared task among family members, especially among spouses (Schafer, 1978; Schafer & Keith, 1982).

Few attempts have been made to discover the effect of widowhood on the eating behaviors and dietary intake of older people. Only one published study dealt with this issue, using a case-control design (Rosenbloom & Whittington, 1993). One hundred people older than age 60, of whom 50 were recently widowed, were interviewed about eating behaviors. Data were self-reported, collected using face-to-face interviews and 3-day food diaries. Widowhood was shown to cause loneliness and diminished interest in the activities surrounding eating: meal planning, shopping, and meal preparation; secondarily, it affected eating behaviors and nutrient intake. Weight loss (self-reported) was significantly higher in the study group (7.64 lb vs. 0.58 lb in the controls,  $p < .001$ ). The study's main limitation was lack of objective support for the self-reported information. Our study used systematically collected data obtained from a large cohort study, the Cardiovascular Health Study (CHS). This was supplemented by questions regarding eating behavior and a nutritional risk assessment using the Nutrition Risk Index (NRI) (Wolinsky et al., 1990).

The present study aims to identify the effect of recent widowhood on eating behavior, dietary intake, depression, and cognitive and physical functioning by comparing widowed elders to age-, sex-, and race-matched controls.

## *Method*

### *STUDY POPULATION*

Fifty-eight recently widowed participants were recruited from the CHS cohort, Pittsburgh center. Eligible for the study group were all CHS participants who became widowed while participating in the study and were widowed for at least 6 months at the time of their evaluation. (The sample included all of the CHS participants who became widowed while participating in the study.) Using a retrospective cohort design, participants were randomly matched for age, sex, and race with 58 randomly selected married participants from the same

study. All participants attended the research clinic between September 1995 and June 1996. They were all ambulatory and able to come to the University of Pittsburgh clinic.

The CHS is a population-based, longitudinal study whose main objective is to identify factors relating to the incidence and natural history of coronary heart disease and stroke. It is a multicenter study, following 5,888 subjects age 65 and older who were enrolled since 1989. The Pittsburgh sample includes 1,275 elderly people with a mean age of 74 at the beginning of the study. Follow-up included a yearly clinic visit and contact by telephone every 6 months (Fried, Nemat, Enright, & Furberg, 1991).

#### *DATA COLLECTION*

Dietary intake was assessed once during the 1995/1996 clinic visit, using Willett's semiquantitative Food Frequency Questionnaire (FFQ), administered in an interview. Models were used for assessing portions (Willett, 1990). The Willett Food Frequency questionnaire is used extensively in epidemiological studies. The tool was validated in the Nurse's Health Study (Willett, 1990). The questionnaire included more than 100 food items that were most frequently eaten by the study population.

For each food item, the following information was recorded: (a) frequency of consumption as number of times per week (1-7), 1 to 3 times per month, or never, and (b) number of daily portions eaten (slices, units, or standard servings). A computerized program for analyzing data was developed specifically for this questionnaire. The total average daily intake was calculated by multiplying the number of portions of a food item eaten per week by the quantity of each component per standard portion of the particular food item. Daily and monthly amounts were converted into mean weekly amounts. Then, the cumulative mean daily amounts of each component contributed by all food items consumed were finally obtained.

#### *EATING BEHAVIOR INTERVIEW*

For the purpose of this study, an eating behavior interview was developed based on the synthesis and modification of three previously

validated questionnaires: questionnaires on eating behavior and on feelings related to eating (Rosenbloom & Whittington, 1993), and the Nutrition Risk Index (NRI) (McIntosh, Shifflet, & Picou, 1989; Wolinsky et al., 1990). Additional items, identified by previous research as relating to diet quality, were also entered on the questionnaire (Falciflia, Wahlbrink, & Suszkiw, 1985; Food and Research Action Center, 1987; McIntosh et al., 1989, Rozin, 1992, Schafer, 1978, Schafer & Keith, 1982; Trinkle, 1992). This detailed questionnaire and its performance values are described elsewhere (Shahar & Shahar, 1999). The interview was conducted once by a single investigator as part of the participant's 1995/1996 clinic visit.

Cognitive function was assessed using 3MSE, a combination of methods including the Folstein mini-mental state examination (Folstein, Folstein, & McHugh, 1975) and the digit-symbol substitution test (Salthouse, 1978). The examination was carried out yearly. The score is based on a maximum score of 100. Physical functioning was assessed using a modified version of the Health Interview Survey Supplement (HISS) on aging questionnaire, which assessed activities of daily living (ADL) and instrumental activities of daily living (Wallace, 1992).

The depression index score was evaluated using the Center for Epidemiological Studies Depression Scale (CESD) (Orme, Reis, & Herz, 1986). The questionnaire was designed for evaluating quality of life and depression. Each question corresponds to a grade from which a total is achieved. A grade greater than 5 means that the participant is at risk for depression.

Subjective health status was self-reported by the participants using a scale from 1 to 5, where 5 = *excellent* and 1 = *poor* health status.

Weight in pounds was measured using a standardized balance-beam scale at each annual visit. Height in meters was measured using a stadiometer (Perspective Enterprises Inc., Kalamazoo, MI). We chose to use weight change instead of Body Mass Index (BMI), as height measurement is controversial in elderly people. Standing height measurements are less reliable due to age-related shortening of the spinal column or inability to stand (Chandra et al., 1991).

Weight change from baseline was defined as the difference between weight at current visit (1995/1996) and weight at baseline (1989/1990). Weight change following widowhood was defined as the difference in

weights between the visit prior to the event and weight at least 6 months following widowhood. The same weight measurements were used in the control group, using the same yearly visits as their counterparts. Two weight patterns were defined: participants who lost weight since the beginning of the study versus those whose weight did not change or whose weight increased.

#### *SAMPLE SIZE CALCULATIONS*

Sample size calculations were made using Kahn's (Kahn & Sempos, 1989) method: Weight loss was chosen as a key measurement. Rosenbloom (Rosenbloom & Whittington, 1993) showed a 0.85 minimal weight difference between the widowed and the married group. Using 80% power and a significance level of .05,  $N$  was computed to include 52 participants in each group (we recruited 58 participants for each group).

#### *ANALYSES*

Statistical analyses included analyses of covariance and  $t$  tests for continuous variables. Contingency table analysis was performed using the  $\chi^2$  test or Fisher's exact test as appropriate for comparison between widowed and married participants. The Mann-Whitney nonparametric test was used to compare the number of participants in each weight pattern. A logistic regression model was constructed to assess the association of the variables measured and weight-change pattern, which is defined above. Variables that correlated to weight change (using Spearman's correlation coefficients) and that had a significance level of .1 were entered into the model.

#### *Results*

Ten men and 48 women participated in each study group, with mean age of 77.6 years and 14 years of education for both groups. The mean widowed years were  $2.9 \pm 1.7$  years. The number of health events, hospitalizations, alcohol and tobacco use (low in both groups), and level of physical activity were similar in both groups.

Weight loss from baseline and weight loss in the year of widowhood were significantly higher among the widowed group, even when adjusted for baseline weight and years of widowhood. Widowed participants lost  $2.03 \pm 8.13$  lb, whereas controls gained  $0.41 \pm 4$  lb, ( $p = .045$ ) in the same year. From baseline, widowed participants lost  $1.40 \pm 4.38$  lb versus a  $2.40 \pm 0.8$  lb gain among controls ( $p = .02$ ). Weight-change patterns were compared between the groups, using the Mann-Whitney nonparametric test. Among the widowed group, 41% followed a pattern of weight loss, whereas only 26% of controls followed this pattern ( $p = .035$ ).

Table 1 presents the current (1995/1996) differences in selected dietary intake, eating behavior, and nonnutritional variables between widowed and married participants. Vitamin A and E intake was significantly higher in the married (control) group. Other than that, no significant differences were found for any of the other nutrients, including caloric intake. The widowed group ate significantly more meals alone ( $p < .001$ ), more commercial meals ( $p = .034$ ), and fewer homemade foods per week. In addition, they reported less enjoyment of eating ( $p < .001$ ), and their total feeling score tended to be lower ( $p = .090$ ). Eating behavior score was significantly lower among the case group ( $p < .001$ ). None of the nonnutritional variables differed between the groups; these included depression score, cognitive functioning, subjective health status, and physical functioning. It is important to note that there was no difference between the groups in cognitive functioning, depression index score, physical functioning, and health status at the beginning of the study (1989/1990).

Other eating behaviors that were compared between the groups included cooking, shopping, and eating-out habits. We found that married people tended to cook by themselves more often; 49% cooked every day compared to 29% in the widowed group ( $p = .004$ ). Married people tended to go shopping together (35%), whereas widowed participants tended to go shopping by themselves (67%) ( $p < .001$ ). Married people shopped more often than the widowed group, and the difference was statistically significant ( $p = .04$ ). No difference was found between the widowed or married participants in the frequency of eating out, but a trend was shown for widowed participants to eat out at lunch more often ( $p = .09$ ).

Table 1  
 Comparison of Selected Dietary Intake, Eating Behavior,  
 and Nonnutritional Variables Between Cases and Controls

Variable	Widowed (n = 58)		Married (n = 58)		P Value
	M	SD	M	SD	
3MSE score	91.9 ± 7.5		94.2 ± 5.6		.08
Depression index score	5.98 ± 4.4		6.87 ± 7.2		.76
Physical functioning score	.43 ± 0.8		.48 ± 1.4		.93
Subjective health status					.89 <sup>a</sup>
Meals skipped/week	1.24 ± 2.3		1.13 ± 2.2		.69
Frequency of eating alone/week	15.9 ± 6.7		3.8 ± 4.5		< .001
Number of snacks/day	1.31 ± 1.36		2.44 ± 1.12		< .001
Commercial meals/week	2 ± 1		1 ± 0.77		.04
Number of food groups eaten/day	3.79 ± .52		3.84 ± .37		.13
Frequency of eating homemade food/week	3.7 ± 0.78		4.3 ± 1.28		.002
Enjoyment of eating	3.8 ± 0.65		4.21 ± 0.45		.003
Frequency of feeling no wish to eat	1.79 ± 1.18		1.46 ± .92		.07
Feeling score	2.55 ± .75		2.7 ± .53		.09
Eating behavior score	1.70 ± .50		2.3 ± .71		< .001
Nutrition Risk Index score (percentage at risk)		14%		17%	.61
Kcal	2,018 ± 572		2,018 ± 616		.48
Vitamin A (IU)	3,625 ± 5,757		5,404 ± 5,757		.04
Vitamin C (mg)	317.1 ± 321		327.1 ± 236.5		.56
Vitamin B-2 (mg)	5.20 ± 11.29		3.70 ± 13.5		.62
Niacin (mg)	34.50 ± 27		37.2 ± 28.4		.91
Vitamin E (IU)	67.5 ± 146.7		149.8 ± 146.7		.01

a. Fisher's exact test

Table 2 presents a logistic regression model using weight-change pattern as the dependent variable (Pattern 1 = weight loss, Pattern 0 = weight gain or no change). Entered into the model were variables that correlated with weight change, using a significance level of .1. Widowhood increased the risk for Pattern 1 (weight loss) (odds ratio = 5.4,  $p = .04$ ), as did older age (odds ratio = 2.42,  $p = .04$ ), lower cognitive functioning (odds ratio = .33 for higher score = better cognitive function), and diminished appetite (odds ratio = .34 for higher score = better appetite). Contrary to our expectations, higher physical functioning scores, associated with higher disability (odds ratio = .33,  $p = .02$ ),

was protective against weight loss. Higher education was associated with weight loss (odds ratio = 2.8,  $p = .04$ ). All other variables, including baseline weight, years of widowhood, depression, number of snacks per day, frequency of eating alone, and frequency of eating homemade food did not reach significance level. The effect of widowhood remained significant after adjusting for all other variables.

### *Discussion*

Few studies have examined the issue of widowhood and nutrition (Lehman, 1989; Maddison & Walker, 1967; Rosenbloom & Whittington, 1993). Maddison and Walker (1967) found substantial health and nutritional status deterioration associated with widowhood. Rosenbloom and Whittington (1993) found that the widowed group lost significantly more weight following widowhood and had poorer eating behaviors, including more meals eaten alone, less enjoyment from eating, and lower appetite levels.

Our study confirms these findings using measured weight. A weight-loss pattern was significantly more frequent in the widowed group. This could not be fully explained by reported dietary intake nor by sociodemographic, economic, and functioning variables.

According to the 1991 Consensus Conference sponsored by the Nutrition Screening Initiative, the loss of a loved one can lead to malnutrition by way of decreased dietary intake. Studies (Fukagawa et al., 1990; Roberts, 1995; Roberts et al., 1994) have shown that compared to younger people, older people who lose weight tend less frequently to regain the weight and that older people tend to adhere to one weight pattern rather than to fluctuate. Thus, the significant weight loss in the year following widowhood can have a future impact on nutritional and health status, initiating and perpetuating a weight-loss trend. About 41% of widowed participants, compared to 26% in the control group, followed a weight-loss pattern.

As for specific nutrients, Rosenbloom's study (Rosenbloom & Whittington, 1993) demonstrated that the widowed group consumed less vitamin B, vitamin D, calcium, zinc, and energy. We failed to confirm these findings. In our group, the intake of vitamins A and E was

Table 2  
 Logistic Regression Model to Predict Weight Change  
 Patterns (0 = Stable or Weight Gain, 1 = Weight Loss)

Variable (N = 116)	Odds Ratio	95% Confidence Interval
Case control (case = 1, control = 0)	5.4	1.2-28.2*
Age (younger than 77 years = 0, older than 77 = 1)	2.42	1.07-6.30*
Years of widowhood (0 = control, 1 = 1/2-1 year, 2 = 1-2 years, 3 = 2-3 years, 4 = more than 4 years)	1.35	0.89-3.30
Education (more than 12 years = 1, less than 12 years = 0)	2.8	1.04-8.40*
3MSE score (1 = 3MSE > 95, 0 = 3MSE < 95)	0.33	0.12-0.86*
Depression Index Score (1 = score > 5, more depressed, 0 = score < 5)	1.34	0.52-2.90
Physical functioning score (0 = no limitation, 1 = some difficulties)	0.33	0.11-0.84*
Subjective appetite evaluation (1 = excellent, 0 = less than excellent)	0.34	0.12-0.98*
Number of snacks per day (1 = more than 1, 0 = less than 1)	1.57	0.638-4.20
Frequency of eating alone per week (0 = less than 4 times, 1 = more than 4 times)	0.70	0.24-2.20
Frequency of eating homemade food (1 = every day, 0 = less than every day)	0.47	0.21-1.23
Weight at the beginning of the study (continuous)	1.23	0.99-1.45

\*Values are statistically significant at 95% confidence levels.

lower among the widowed group, which may suggest a decreased intake of fatty foods. A possible explanation for the observed lack of consistency between past studies and the current one is the assessment tool used. Willett's FFQ was used in our study. Under this method, constant portion sizes may lead to overestimation of caloric intake in the final report (Willett, 1990). Elderly people who eat less may tend to exaggerate the amounts eaten, possibly to assure their family and themselves that they eat enough. Further investigation is needed to clarify whether the intake of specific nutrients changes following widowhood.

By dramatically changing the social environment of our participants, widowhood triggered changes in daily routines associated with food preparation and eating. The cessation of a long-shared

relationship produced loneliness and a lack of interest in activities surrounding eating, such as cooking and grocery shopping. This resulted in increased episodes of "no wish to eat" and lack of enjoyment. Previous studies (McIntosh et al., 1989; Payette, Gray-Donald, Cyr, & Boutier, 1995; Schafer & Keith, 1982; Walker & Beauchene, 1991) showed that such feelings may decrease diet quality and, therefore, produce nutritional deterioration. The current study demonstrated that widowed participants have less food enjoyment and a lower global eating-behavior score. Future studies may shed light on the behavioral changes associated with widowhood and allow the development of intervention programs.

An interesting relationship was shown between lower cognitive function and increased risk for weight loss. Goodwin, Goodwin, and Gary (1983) reported an association between cognitive function and weight loss, although they could not demonstrate cause and effect. In our group, cognitive decline paralleled weight loss rather than preceding it, suggesting that weight loss did not result from cognitive decline. The group is too small to prove or disprove such a hypothesis.

Grief following widowhood has been found to be associated with deterioration of cognitive function in previous works (Parkes, 1964b). In addition, bereavement may be a cause of mental illness. In a study of admissions to the Bethlehem Royal Maudsley Hospital, patients who lost a spouse shortly before the onset of their mental illness were found to be five times more common than would be expected in the usual admission groups (Parkes, 1964a). Our findings did not detect a significant difference in cognitive functioning between the widowed and control groups. This difference in findings may be explained by the fact that evaluation was not done shortly after the event.

Many elderly people have limited physical functioning, which affects their ability to shop for and to prepare food. Therefore, physical functioning, especially regarding shopping and carrying food, was evaluated in relation to dietary intake, weight change, and eating behavior. However, no difference in physical functioning was found between the groups; levels of disability increased in both groups and did not differ statistically. Parkes (1964b), in his review of medical records of widowed people, found evidence of deterioration of physical functioning following widowhood. Osteoarthritis, a disease that

affects physical functioning, increased by one and half times after bereavement. (No control group was used to evaluate his results.)

Surprisingly, in the regression analysis, a higher physical functioning score, indicating higher disability, was independently associated with stable weight or weight gain. An explanation for this phenomenon may be related to the group's lower level of physical activity, which in turn may protect them from weight loss. This could not be confirmed from the data.

The main limitation of the study is its retrospective design. Another disadvantage is the potential for selection bias in the widowed group, because our data were collected at least 6 months following the event of widowhood and only from participants who could attend the clinic visit. Because widowhood is associated with increased mortality and morbidity (Helsing et al., 1981), it is possible that we missed widowed participants who were sicker, depressed, or severely disabled, and those dying within a half year of widowhood.

Another important limitation of the study is the underrepresentation of men in our sample. This can probably be explained by the higher proportion of women among the widowed elderly. Nonetheless, such a ratio, and the resultant small sample of men, precludes the generalization of our results to both sexes. A bigger sample of widowed men is needed to allow such a generalization.

The results of this study show clearly that the effect of widowhood on weight loss is real and may be potentially harmful. Widowhood is associated with changes in eating habits and in enjoyment of eating, together with food-related activities, such as cooking and shopping. Health services providers should be aware of the risks associated with widowhood and should invest greater effort in programs that seek to prevent nutritional deterioration. Future research needs to identify key behaviors resulting in weight loss in both men and women, so that intervention can be directed at those target areas. An ideal intervention program for widowed elderly people should be simple, flexible, and inexpensive. Its delivery can then be modified to match the needs of various populations. The efficacy of such a program should be measured in fewer deaths, institutionalizations, and hospitalizations, and in weight preservation among newly widowed elderly.

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