

The Transition to Widowhood and the Social Regulation of Health: Consequences for Health and Health Risk Behavior

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Objectives. This study estimates the effects of the transition to widowhood on changes in the social regulation of health and examines the consequences of this association for health and health risk behavior following spousal death.

Methods. Analysis of longitudinal data from the Changing Lives of Older Couples Study tests the following hypotheses: (a) Widowed individuals experience greater declines in health regulation over time than their married counterparts and (b) the extent to which widowhood undermines health and increases health risk behavior depends on whether it is accompanied by a decline in health regulation.

Results. Compared with their continually married counterparts, those who experience the transition to widowhood report a significant decline in the frequency of health reminders and health assistance received from others. The decline in the frequency of health regulation has important consequences for health behavior and health outcomes. Widowhood undermines health and increases health risk behaviors only when it is accompanied by a decline in health regulation. Widowed individuals who experience increases in health regulation show improvements in health and declines in health risk behavior.

Discussion. Interventions targeted at improving the health habits of widowed individuals by mobilizing health-related support systems may be effective at minimizing the negative health consequences of spousal loss.

A SUBSTANTIAL body of evidence indicates that widowhood is associated with declines in health and increases in mortality risk for surviving spouses (Martikainen & Valkonen, 1996; Mineau, Smith, & Bean, 2002; Schaefer, Quesenberry, & Wi, 1995; Stroebe & Stroebe, 1987; Zick & Smith, 1996). A range of mechanisms may account for this association, including the loss of social support, the stress of bereavement, and adjustments to managing a household alone (Ross, Mirowsky, & Goldstein, 1990; Stroebe & Stroebe, 1987; Umberson, Wortman, & Kessler, 1992). Research and theory on the health benefits of marriage suggest that the social control and regulation of health provided by a spouse constitute an additional mechanism that explains its salutary effects on health and well-being (Umberson, 1987, 1992). For example, spouses tend to encourage each other to engage in healthy behaviors (e.g., exercise, maintaining a healthy weight, and regular medical check-ups) and to avoid behaviors that might compromise health (e.g., excessive alcohol consumption, cigarette smoking, and other forms of risk taking). Thus, the deleterious health consequences of widowhood may be due in part to the loss of a primary source of health regulation. Although convincing evidence indicates that married individuals receive more frequent health-related reminders from significant others than the unmarried (Umberson, 1992), the importance of this mechanism in explaining the negative health consequences of widowhood, per se, remains largely unexplored.

The aim of the current study is to examine the effects of the transition to widowhood on the frequency of health reminders received from others. Previous research suggests that because

spouses are a primary source of health reminders, the transition to widowhood will be associated with a decline in the frequency of health regulation. I further hypothesize that changes in the frequency of health regulation have important consequences for the health and health-related behaviors of older widowed adults. Specifically, whether the transition to widowhood undermines health or increases risky health behaviors should depend on the extent to which it is accompanied by a decline in the frequency of health regulation.

Widowhood, Social Control, and Health: Understanding the Pathways

Widowhood appears to pose substantial health risks to surviving spouses, especially to men (Martikainen & Valkonen, 1996; Mineau et al., 2002; Schaefer et al., 1995; Stroebe & Stroebe, 1993; Umberson et al., 1992). Theoretical work that attempts to account for the negative effects of widowhood on health derives primarily from the larger research literature on the association of marital status with health and well-being. Decades of research in the social and biological sciences indicate that married individuals feel healthier, have fewer illnesses, are less depressed, and live longer than the unmarried (Hemstrom, 1996; Lillard & Waite, 1995; Rogers, 1995; also see Waite & Gallagher, 2000).

Researchers have only recently begun to identify and understand the mechanisms through which emotionally supportive social relationships, especially marriage, enhance health. The stress-alleviating role of social support has received the most attention (House, Landis, & Umberson, 1988). Supportive personal relationships such as marriage appear to

enhance the immune system (Cohen, 1988; Kiecolt-Glaser & Glaser, 1987) and normalize cardiovascular reactivity to socio-environmental stressors (Cohen, 1988). In addition, the loss of the marital role through divorce or widowhood is itself stressful and may expose individuals to additional strains such as financial problems and secondary role changes (Booth & Amato, 1991; Umberson et al., 1992; Williams, Takeuchi, & Adair, 1992).

Researchers have given much less attention to examining the importance of the controlling or regulatory functions of marriage, which may promote healthy behaviors. According to this argument, marriage and other strong social ties affect health in part because significant others, especially spouses, encourage individuals to engage in behaviors that promote health (e.g., exercise, weight management) and to avoid risky behaviors (e.g., smoking) (Umberson, 1992). In support of this idea, evidence indicates that married men are more likely than the unmarried to have someone who reminds them to engage in health-enhancing behavior and to avoid practices that compromise health (Umberson, 1992). Further, the benefits of marriage for health regulation seem to be especially important for men, in part because gender roles assign women primary responsibility for the care and health of the family (Nathanson, 1977; Waldron, 1988).

Although some research suggests that the health-regulatory functions of marriage are partly responsible for its salubrious effects (Umberson, 1987, 1992), data and other limitations have inhibited stringent tests of this hypothesized causal pathway. Most significant is the lack of longitudinal data. In a cross-sectional study of marital status, social control, and health behavior, Umberson (1992) found that being married is associated with more frequent social control efforts. However, because socially isolated individuals are less likely than others to marry and less likely to receive frequent health reminders, selection of the most socially integrated individuals into marriage may partly account for cross-sectional associations. In the current study, measurement of the social regulation of health at more than one point in time allows for a more stringent test of a causal relationship because it facilitates the examination of the effects of a marital transition (e.g., widowhood) on a subsequent change in the frequency of health reminders.

It is particularly important to understand the effects of the transition to widowhood on health regulation, health risk behaviors, and health outcomes. Because health declines more rapidly in later years when widowhood is most commonly experienced, the widowed may be especially vulnerable to the negative health consequences of unhealthy practices such as lack of exercise, improper nutrition, lack of sleep, or alcohol abuse—each of which may be influenced by the loss of a spouse. In addition, socioemotional selectivity theory suggests that widowhood may have especially significant consequences for the control and regulation of health behaviors. According to this perspective, individuals narrow their social networks as they age and begin to focus more exclusively on primary relationships such as marriage (Carstensen, 1992). Thus, in later years, the spouse may become increasingly important as a source of both social support and the social regulation of health. If this is true, exiting marriage in later life through widowhood may have especially strong negative effects on health behavior and overall health status.

The Current Study

Prior research has given little attention to establishing clear linkages between marital status, the social regulation of health, and actual health outcomes. Marriage appears to be associated with healthier behavior (Umberson, 1987) and more frequent health regulation (Umberson, 1992). More frequent regulation of health is, in turn, associated with positive changes in health behavior (Lewis & Rook, 1999; Umberson, 1992). Further, entire research literatures in public health and health psychology document the substantial effects of health behavior on self-assessed health, morbidity, and mortality. However, the following possibility remains unexamined: The extent to which widowhood undermines health and compromises healthy behavior may depend on whether the transition is accompanied by a decline in the frequency of health reminders.

In fact, a central hypothesis of the current study is that the transition to widowhood undermines health and healthy behaviors only when it is accompanied by a decline in the frequency of health regulation. Although I expect that the transition to widowhood will be generally associated with a decline in the frequency of health reminders (largely due to the loss of the spouse—a primary source of such reminders), it may lead to an increase in health regulation for those who effectively mobilize social support or for those whose spouse did not provide frequent health reminders in the first place. When widowhood is accompanied by an increase in health reminders, the health and health-related behaviors of the widowed should not decline and may even improve. Support for these hypotheses could have important implications for medical professionals and others who provide services to widowed adults because it would suggest that health promotion efforts have great potential for reducing any negative effects of widowhood on morbidity, mortality, and overall health status. It is important to note that although prior research indicates that men may be especially vulnerable to the loss of health regulation with the death of a spouse, currently available longitudinal data on widowhood and health regulation do not include a sufficient number of men to allow a meaningful analysis of gender differences.

METHODS

Data

Data are from the Changing Lives of Older Couples (CLOC) Study, which is a multiwave, prospective study of spousal bereavement. Two-stage area probability sampling from the Detroit (Michigan) Standardized Metropolitan Statistical Area was used to recruit a sample of 1,532 married men and women. Eligible respondents were English-speaking members of a married couple in which the husband was age 65 or older. The response rate for the baseline interview was 68% and is consistent with response rates obtained in similar studies in this area.

Interviewers conducted face-to-face interviews lasting approximately 2.5 hours from June 1987 through April 1988. Researchers tracked subsequent spousal death using monthly death records provided by the state of Michigan and by monitoring the daily obituaries in Detroit-area newspapers. Confirmation of death and identification of the cause of death were obtained from the National Death Index and from direct

examination of death certificates. Of the 335 respondents known to have lost a spouse during the study period, 316 were contacted for follow-up interviews (19 of those who lost a spouse died themselves during the interim). Of those contacted, 263 (83%) participated in at least one of the three follow-up interviews, which were conducted 6 months (T1), 18 months (T2), and 48 months (T3) after the spouse's death. At each follow-up, every widowed person was assigned a same-sex, same-age-matched, nonbereaved control from the baseline sample who was also interviewed. Although all control subjects were interviewed in the baseline sample, a given widowed person may have been assigned a different age- and sex-matched control at different waves (i.e., the control sample is not the same at successive waves).

Analyses in the current study were weighted to adjust for differential response rates at baseline and unequal probabilities of selection. All models use data from the baseline (T0) sample and from the 203 widowed persons and 199 matched controls who were interviewed at 18 months post widowhood (T2) and whose spouse was not living in a nursing home at the baseline interview. Although preliminary analyses suggested that widowhood may have different consequences for those whose spouse dies while in a nursing home, the small number of such respondents prohibited meaningful analysis of these differences.

Measures

Transition to widowhood.—A dummy variable indicates whether respondents experienced a transition to widowhood between the baseline and T2 interviews. The variable is coded so that 1 = transition to widowhood and 0 = continually married.

Social regulation of health.—The social regulation of health was assessed at each wave with two items in which respondents were asked to indicate how often someone (a) reminds you to do things to protect your own health and (b) helps you to take medications, eat a special diet for health reasons, or use health care treatments at home (among those who are required to engage in these behaviors). Response categories for each item ranged from never (1) to often (3). I standardized each item using the baseline mean and standard deviation. For those who engaged in the behaviors outlined in item (b) above, I computed the arithmetic mean of the two items. I used only the response on item (a) for those who did not engage in the behaviors described in item (b).

Change in the social regulation of health among the continually widowed is included in some models. This variable was constructed by subtracting the T0 value of health regulation from the T2 value and centering the difference at the mean. I used an internal moderator of health regulation change among the widowed to test the hypothesis that widowed individuals experience a decline in health and an increase in health risk behaviors compared with the continually married control group only when widowhood is accompanied by a decline in health regulation. Therefore, I assigned a score of 0 (the mean) to the continually married on this internal moderator variable.

Risky health behavior.—I constructed a dichotomous indicator of risky health behavior by assigning a code of 1 to

those individuals who reported any of the following four health behaviors or conditions: (a) rarely or never walks or exercises for pleasure and rarely or never participates in active sports or exercise; (b) has an unhealthy body weight (defined as a body mass index of <18.5 or >25) (U.S. Department of Health and Human Services, 2000); (c) currently smokes cigarettes; (d) gets <7 hours of sleep per 24-hour period, including naps.

Health outcomes.—Two health outcomes were examined. Self-assessed fair or poor health was constructed by dichotomizing responses to the following question: "How would you rate your health at the present time?" Responses of "fair" and "poor" were combined into a single category and assigned a code of 1. Those who responded "good," "very good," or "excellent" received a code of 0. Self-assessed health is widely recognized as a valid indicator of overall health status (Ferraro & Farmer, 1999) and is predictive of subsequent mortality (Idler & Kasl, 1991). Additional analyses in which this variable was kept in its original ordinal form indicate that results from the two approaches are very similar, but the dichotomized indicator produces slightly more robust results. Moreover, ordered probit regression is appropriate when the self-assessed health variable is kept in its ordered form, and these results are often difficult for the lay reader to interpret.

Morbidity is a dichotomous variable coded 1 if, in the last 6 months, the respondent had one or more serious illnesses and 0 if no serious illnesses were reported. The range of possible illnesses included lung disease, hypertension, heart disease, diabetes, cancer, and stroke.

Sociodemographic and other control variables.—All models control for a range of sociodemographic variables including sex (1 = female), education in years, age in years, race (1 = White), and total household income in dollars at baseline. Respondents provided their total household income at baseline by indicating which of 10 income categories most accurately characterized their economic status. The midpoint of these categories was used to derive a continuous indicator of income. All models also control for whether or not the spouse had an illness or disability at baseline that required the provision of care (1 = yes). The provision of care to a spouse at baseline is positively associated with subsequent widowhood but may also affect the baseline measurement of health and health behaviors, especially when the baseline assessment is taken near the time of widowhood.

Time from baseline to widowhood.—A strength of the CLOC Study is that the time from widowhood to subsequent follow-up interviews (12 months in the current study) is standardized for all respondents. This eliminates the possibility that group variations in time since widowhood are responsible for group variations in the estimated effects of widowhood on well-being. This approach, however, produces variation across individuals in the amount of time elapsed between (a) the baseline measurement and the death of the spouse and, therefore, between (b) the baseline measurement and the follow-up interview. In the current study, models assessing change in health associated with the transition to widowhood estimate this association across a range of time periods. All

Table 1. Weighted Means of All Variables in the Analysis by Marital Status

Variable	Widowed	Continually Married
Frequency of health regulation		
T0 frequency of health regulation	-.233	.078
T2 frequency of health regulation	-.277	.168
Change in health regulation T0–T2	-.043	.089
Control variables		
White	.831	.850
Income T0	4.093	5.047
Age T0	69.669	69.943
Female	.743	.697
Months between T0 and T2	42.223	47.195
Education T0	11.324	11.982
Respondent provides care to spouse T0	.251	.063
Dependent variables and lagged values		
Engaged in risky health behavior T0	.817	.784
Engaged in risky health behavior T2	.807	.807
Fair or poor self-assessed health T0	.301	.241
Fair or poor self-assessed health T2	.307	.319
Serious illness T0	.612	.631
Serious illness T2	.615	.738
<i>N</i>	203	199

analyses control for the number of months between baseline and follow-up.

Means.—Weighted means and standard deviations of all variables in the analysis are presented separately for widowed subjects and the continually married in Table 1. Although widowed and married individuals are closely matched on most sociodemographic characteristics, two noteworthy differences exist. First, those who experience the transition to widowhood between T0 and T2 report lower levels of health regulation both before (–.233) and after (–.277) widowhood compared with their continually married counterparts (.078 at T0 and .168 at T2). This suggests that declines in health that accompany the transition to widowhood may begin before the spouse's death, especially when the death is preceded by a period of illness. Additional analyses (not shown) indicate that the lower levels of health regulation preceding widowhood may be due in part to the provision of care to a sick or dying spouse at baseline—a situation that is more common among widowed (.251) than married (.063) persons. The illness of a spouse not only reduces the health regulation within marriage but may also isolate the caregiver from other sources of health reminders (e.g., friends, relatives). All longitudinal analyses in the current study include a control for baseline differences in health regulation as well as a dummy variable indicating whether the spouse required care at baseline. Although this approach should produce more conservative estimates of the effect of widowhood on health (especially among those for whom health regulation begins to decline prior to widowhood), it helps to isolate the effects of the death of the spouse from (a) widowhood-related processes that begin prior to the spouse's death and (b) any tendency of those who infrequently engage in health regulation to be selected into widowhood.

Second, although the average change in health regulation for the widowed is negative, the average change in health

Table 2. OLS Estimates of the Effect of Transition to Widowhood on Change in Frequency of Health Regulation

Independent Variables	T2 Frequency of Health Regulation
T0 frequency of health regulation ^a	.237 (.068)***
Transition to widowhood T0–T2 ^b	–.392 (.108)***
White	–.372 (.157)*
Income T0	.006 (.027)
Age T0	–.003 (.009)
Female	–.290 (.190)
Months between T0 and T2	–.005 (.003)
Education T0	.036 (.029)
Respondent provides care to spouse T0	.178 (.126)
Constant	.594 (.803)
<i>R</i> ²	.183
<i>N</i>	402

Notes: OLS = ordinary least squares.

^aHigher values indicate more frequent health regulation.

^bCompared with the continually married.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$ (two-tailed tests).

regulation for the continually married is positive. Thus, whereas widowed individuals experience a general decline in the frequency of health regulation over time, their continually married counterparts experience an increase. This latter finding suggests that, among the married, spouses and others may step up their health regulation efforts as individuals age and encounter age-related health problems of their own and health problems and deaths of their contemporaries.

Analytic strategy.—All models control for the lagged (baseline) value of the dependent variable. The sign of coefficients in lagged dependent variable models reflects the direction of change in the dependent variable across the period of time under consideration (Kessler & Greenberg, 1981). Thus, in the current models, a positive coefficient for the transition to widowhood indicates that the transition is associated with an increase in the dependent variable over time (or an increase in the probability of scoring a 1 on a dichotomous dependent variable), and a negative coefficient reflects a decrease in the dependent variable (or a decrease in the probability of scoring a 1 on a dichotomous dependent variable) relative to the change that is experienced by the continually married control group. Because this approach estimates the effect of the transition to widowhood on a change in the outcome of interest, it reduces the probability that observed associations reflect selection of the least healthy individuals (or those who receive little health regulation) into the widowed status, perhaps due to an unhealthy environment shared by both spouses.

RESULTS

Transition to Widowhood and Social Regulation of Health

I first estimate the effect of the transition to widowhood on the frequency of health regulation at 18 months post widowhood, while controlling for prewidowhood health regulation. The results are shown in Table 2 and support my primary hypothesis that, on average, the transition to widowhood

Table 3. Estimated Effects of the Transition to Widowhood and Health Regulation Change on Health Behavior and Health Outcomes^a

Independent Variables	Pr (Risky Health Behavior)		Pr (Fair or Poor Health)		Pr (Serious Illness T2)	
	M1	M2	M1	M2	M1	M2
T0 value of dependent variable	2.750 (.380)***	2.842 (.363)***	2.457 (.358)***	2.504 (.361)***	3.330 (.346)***	3.448 (.360)***
Transition to widowhood T0–T2 ^b	–.337 (.414)	–.345 (.410)	–.344 (.360)	–.409 (.361)	–.924 (.382)*	–.752 (2.976)
Transition to widowhood × Age	—	—	—	—	—	–.003 (.043)
Health regulation change T0–T2 × Widowhood	—	–.828 (.307)**	—	–.420 (.213)*	—	–4.161 (1.940)*
Health regulation change T0–T2 × Widowhood × Age	—	—	—	—	—	.055 (.027)*
Pseudo- <i>R</i> ²	.277	.299	.228	.236	.361	.371
<i>N</i>	402	402	402	402	402	402

Notes: Pr = Probability; M = Model.

^aModel includes controls for T0 values of race, age, gender, education, care provision to spouse, and number of months between T0 and T2.

^bCompared with the continually married.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$ (two-tailed tests).

undermines the social regulation of health. Those who experience the transition to widowhood report substantially lower levels of health regulation post widowhood than their continually married counterparts, controlling for prewidowhood differences in health regulation. In sum, the transition to widowhood appears to be associated with a substantial and significant decline in the frequency of health regulation compared with remaining continually married.

It is important to note that the means shown in Table 1 indicate that, on average, widowed persons experience a small decline in health regulation over time and married persons report a small increase. Therefore, an accurate interpretation of the multivariate results shown in Table 2 recognizes that widowhood is associated with a decline in the frequency of health regulation relative to the change experienced by the continually married. Thus, the estimated negative effect of the transition to widowhood on the frequency of health regulation shown in Table 2 exists because (a) widowed persons experience an average decline in the frequency of health regulation over time and (b) widowed persons do not receive the benefits of increased health regulation over time that the continually married experience. In sum, although widowhood appears to somewhat undermine health regulation for the average person, it also comes at a time (in this sample) when health regulation is likely more important than ever, as evidenced by the increase in health regulation that occurs among the continually married.

Transition to Widowhood, Risky Health Behavior, and Health Outcomes

Models assessing the impact of the transition to widowhood on change in (a) the probability of exhibiting risky health behavior, (b) the probability of reporting fair or poor self-assessed health, and (c) the probability of having a serious illness are shown in Table 3. For each dependent variable, Model 1 is the base model before interaction terms are entered. The internal moderator of absolute health regulation change among the widowed is added in Model 2. Note that the internal moderator does not assess health regulation change relative to the continually married. Rather, it captures absolute declines in

health regulation over time among the widowed. Preliminary models also assessed age differences in the effects of the transition to widowhood (age × widowhood) on each outcome and age differences in the moderating effect of health regulation change (age × health regulation change among the widowed). Age interactions terms were significant only in models predicting serious illness and are included in Model 2 for this dependent variable.

The significant coefficients for health regulation change among the widowed (health regulation change T0–T2 × widowhood) in all models support the primary hypotheses of this study. The extent to which widowhood increases unhealthy behaviors, undermines health, and increases morbidity risk relative to remaining continually married depends on whether it is accompanied by an absolute decline in the social regulation of health. Specifically, the transition to widowhood is associated with an increase in risky health behavior only when it is accompanied by a decline in the frequency of health regulation. For example, among those for whom widowhood is accompanied by a 1-*SD* decline in health regulation, the transition to widowhood is associated with a .535 increase in the log odds of engaging in risky health behavior (–.345 + [–.828 × –1] = .535). In contrast, when widowhood is accompanied by a 1-*SD* increase in health regulation, it is associated with a 1.225 decrease in the log odds of engaging in risky health behavior (–.345 + [–.828 × 1] = –1.225) compared with the change experienced by the continually married. Similarly, becoming widowed is associated with an increase in the probability of reporting fair or poor health, but only when it is accompanied by a decline in health regulation. For example, when widowhood is accompanied by a 1-*SD* decline in health regulation, it is associated with a .011 increase in the log odds of reporting fair or poor health (–.409 + [–.420 × –1] = .011). In fact, when widowhood is accompanied by a substantial 2-*SD* increase in health regulation, it results in an improvement in health—a 1.249 decrease in the log odds of reporting fair or poor health (–.409 + [–.420 × 2] = –1.249).

The significant three-way interaction of widowhood and health regulation change with age indicates that the role of health regulation change in moderating the impact of

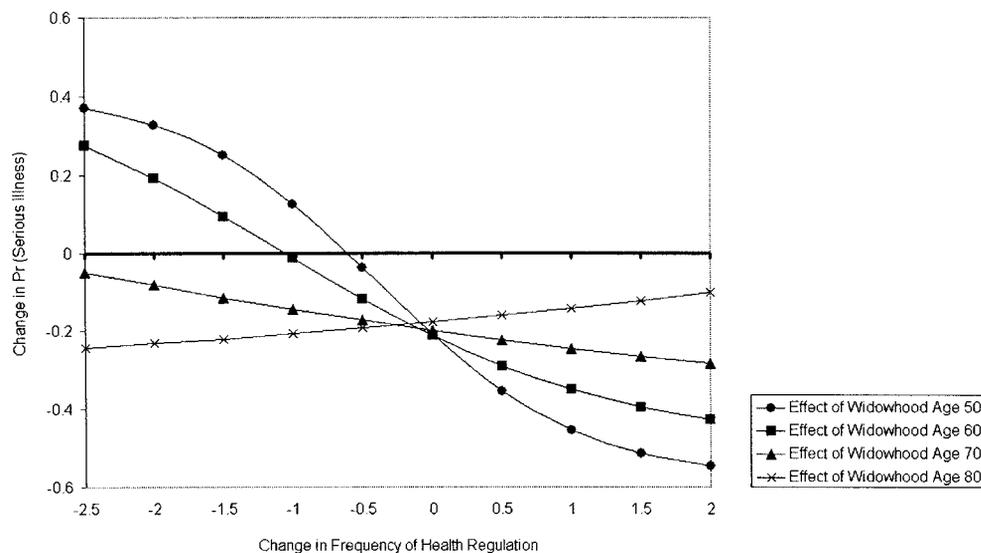


Figure 1. Estimated effect of the transition to widowhood on probability (Pr) of having a serious illness by age and change in health regulation.

widowhood on morbidity depends on age. This association is shown in Figure 1, which was constructed by calculating the estimated probability of reporting a serious illness at Time 2 for those experiencing the transition to widowhood at various levels of health regulation change and for the control group of continually married adults. The predicted probability of a serious illness for the widowed individuals at each level of health regulation change is then subtracted from the predicted value for the control group. The y-axis therefore shows the estimated effect of the transition to widowhood on a change in the probability of a serious illness at each level of health regulation change, within the range of the data.

For 50- and 60-year-olds, the general pattern of association is similar to that observed for self-assessed health and risky health behaviors: increases in morbidity for the widowed persons who experience declines in health regulation and decreases in morbidity for the widowed persons who experience increases in health regulation. However, for 70-year-olds, although the transition to widowhood is associated with a decline in morbidity risk when it is accompanied by increased health regulation, it does not significantly increase morbidity risk even when health regulation declines. Similarly, for 80-year-olds, widowhood appears to be associated with a small decline in morbidity risk even when it is accompanied by a decline in health regulation. The decline in morbidity risk associated with widowhood among the oldest adults likely reflects relief from the strains associated with living with a sick or dying spouse. Research indicates that older adults more often find themselves in the caregiver role and may be especially vulnerable to the strains associated with providing care to a spouse (Marks, 1996). Thus, the health of older adults may improve when widowhood brings relief from care-provider strains.

DISCUSSION

Contrary to the common belief that individuals often become ill or die soon after the death of a spouse, the current study

indicates that declines in health with widowhood are not inevitable. Instead, they are largely dependent on a process that is highly amenable to intervention: the social regulation of health. Two central findings support this conclusion. First, widowed individuals report substantial declines in the frequency of health reminders compared with the continually married. This reflects absolute declines in health reminders that accompany the transition to widowhood as well as the fact that the widowed do not receive the advantage of increased health regulation over time that their married counterparts report. Second, widowhood increases unhealthy practices, increases the probability of experiencing a serious illness, and increases the probability of reporting fair or poor health but only for those widowed individuals who experience an absolute decline in health reminders and assistance received from others. Although widowhood poses health risks, the current findings suggest that declines in health that tend to accompany widowhood are not inevitable. In fact, when widowhood results in increased health regulation, it may have positive consequences for some health outcomes.

A limitation of the current analysis is the inability to assess gender differences in the links between widowhood, health regulation, health behavior, and health outcomes. Cross-sectional research indicates that because women more frequently regulate the health of their spouse than do men, the positive influence of marriage on healthy behaviors is greater for men than for women (Umberson, 1987). Because widowhood is much more common among women than among men, the small number of men in the sample did not allow for separate analyses by gender. It is likely that the effects of widowhood on declines in health regulation are stronger among men than women.

The current findings have important implications for medical practitioners, counselors, family members, and others interested in promoting adjustment to spousal bereavement. Greater attention to the health practices of older adults following widowhood may go a long way toward offsetting the negative

consequences of widowhood. It is important to note, however, that not all attempts at health regulation are likely to be beneficial. Some evidence indicates that negative social control tactics (e.g., pressure, inducing guilt) have little effect on behavior change and may undermine psychological well-being and physical health (Lewis & Rock, 1999). Thus, the associations observed here would likely be more robust if health reminders that are delivered and received in a positive manner were distinguished from those perceived as negative. Moreover, being responsible for regulating another's health may generate stress that can undermine the health of the person providing health regulation and assistance.

The results of the current study suggest that health regulation is a primary mechanism through which marriage (and, perhaps, other personal relationships) influences health. However, much remains to be discovered about the dynamics of health regulation in marriage. A list of desiderata for future data collection efforts includes (a) longitudinal assessments of various dimensions of health regulation activities (including general health reminders and more targeted efforts to encourage specific behavior such as weight management, nutritious eating, smoking cessation, and exercise), (b) dyadic data from both participants in the health regulation process, (c) measures of how health reminders are perceived by the receiver and the provider (positive, negative, helpful, stressful), and (d) a sufficient sample size to allow for the examination of gender, race, socioeconomic, and life course variations in the predictors and consequences of health regulation.

Better data would allow researchers to investigate the processes through which dyads exchange health reminders and determine which conditions enhance the efficacy of health regulation efforts. Future research should also identify the social and contextual factors that characterize those individuals who are most likely to experience declines in health regulation with widowhood. Such information would be of great value in designing targeted interventions for those at greatest risk of health decline following widowhood. The results of the current study optimistically suggest that these declines are not inevitable.

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