POPULATIONS AT RISK

Quality of Preventive Clinical Services Among Caregivers in the Health and Retirement Study

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We examined the association between caregiving for a spouse and preventive clinical services (self-reported influenza vaccination, cholesterol screening, mammography, Pap smear, and prostate cancer screening over 2 years and monthly self-breast exam) for the caregiver in a cross-sectional analysis of the Health and Retirement Study, a nationally representative sample of U.S. adults aged ≥50 years (N = 11,394). Spouses engaged in 0, 1–14, or ≥14 hours per week of caregiving. Each service was examined in logistic regression models adjusting for caregiver characteristics. After adjustment for covariates, there were no significant associations between spousal caregiving and likelihood of caregiver receipt of preventive services.

KEY WORDS: **caregiving; prevention; mammography; influenza; cholesterol.**
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Over 6 million adults in the United States provide long-term, unpaid care to disabled elderly persons in their families, particularly elderly spouses.[1] These caregivers are at increased risk of mortality.[2] Possible explanations include higher rates of negative health behaviors and health outcomes among caregivers, such as not having enough time to exercise, forgetting to take prescription medications, fatigue, depression, and worse blood pressure and lipid control.[3–10]

It is unclear whether the association between caregiving and mortality is also mediated through poorer quality health care to the caregivers, including decreased delivery of preventive clinical services. Caregiving consumes time and financial resources that may interfere with proper preventive care. In the Caregiver Health Effects Study, there was no association between caregiving and caregiver receipt of immunizations[3]; another study of caregiving found no association between caregiving and mammography, colon cancer screening, or Pap smear performance.[11] In contrast, another study noted that caregivers were actually more likely than noncaregivers to get flu shots and receive pneumonia vaccines.[12]

These studies may have conflicting results due to differing study populations and the services examined. Studies focusing on health services delivered in the medical office involved select populations.[11,12] For specific services such as influenza vaccination, caregiving could possibly provide increased opportunities through doctor visits provided for the caregiving recipient. Alternatively, for services that require an appointment such as Pap smears, caregiving could reduce the time available for such visits.

Given the conflicting results of prior studies of caregiving's effect on the use of preventive clinical services, we examined the association between an extended list of preventive clinical services and spousal caregiving in the Health and Retirement Study (HRS). To our knowledge, the HRS has enrolled the largest number of participants in studies of spousal caregiving and health services to date and also has detailed caregiving data as well as clinical service information.

METHODS

Data Sources and Collection Procedures

The HRS is a biennial longitudinal survey of a nationally representative cohort of the U.S. population aged 50 years or older[13]; for the purposes of this analysis, we analyzed year 2000 interviews. Both spouses within married households received a full interview. Our study sample included 11,394 married individuals aged 50 years or older with two respondents in the household who lived in the community.

The main outcome variables were caregiver self-reported receipt of preventive clinical services including influenza vaccinations, Pap smears, mammograms, cholesterol screening, and prostate screening over the past 2 years and

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monthly self-breast exam. The primary independent variable was the amount of informal caregiving provided. Respondents were classified as having received informal home care if they received in-home assistance with any activity of daily living (ADL), such as eating, transferring, toileting, dressing, bathing, walking across a room, or instrumental activity of daily living (IADL), such as preparing meals, grocery shopping, making telephone calls, taking medications, or managing money in the prior month from a relative (paid or not) or unpaid nonrelative with no organizational affiliation.[14] Respondents who did not normally perform an IADL, such as shopping, were not classified as having an IADL impairment nor as having received help for that IADL. The number of weekly hours of informal home care was calculated using the average number of days per week (in the prior month), and the average number of hours per day that respondents reported receiving help from their spouse.[15] We created tertiles of the number of hours of caregiving received, and from this we were able to create three categories of caregiving for the spouses. Caregivers were grouped into three categories: not providing care (noncaregivers), providing care for 1 to 14 hours a week, and providing care for more than 14 hours per week.

Statistical Analysis

To examine the association between the dependent variable of caregiver receipt of clinical service and the independent variable of caregiving, we examined each clinical service individually using logistic regression models. All analyses were weighted for differential probability of selection and adjusted for the complex sampling design of the HRS.[13] We tested for significant interactions between all covariates, and regression diagnostics were performed to check for model assumptions. All covariates reflect characteristics of the caregiver, not the recipient of care, except for the presence of paid (formal) home care (Table 1).

We performed sensitivity analyses where we excluded data obtained from proxy respondents (N = 1,290) but found little change in the results (results not shown) and therefore present the results including these data. Due to the possibility that we were overadjusting by including both caregiver comorbidities and caregiver health status in the model, we constructed models with and without caregiver chronic medical conditions based on the Charlson comorbidity index[16] and caregiver health status and found little difference (results not shown). This finding, combined with our reliance on self-report for caregiver comorbidities, led

Table 1. Participant Characteristics by Weekly Informal Care Hours Provided to Spouse, Percentages, or Weighted Means

	Hours of Caregiving per Week			
Caregiver Characteristics	**No Care (N = 10,328)**	**1 to 14 Hours (N = 622)**	**>14 Hours (N = 444)**	***P* Value**
Age, y	65 (0)†	68 (1)	71 (0)	<.001
Female	47	55	49	.002
Race				<.001
White	91	87	85	
African American	6	8	11	
Other	3	5	5	
Education, y	13 (0)	11 (0)	11 (0)	<.001
Net worth, thousands of dollars	512 (21)	365 (61)	253 (36)	<.001
Current employment	42	32	18	<.001
Resident children, number				.2
None	78	80	82	
1 child	16	15	13	
>1 child	6	5	5	
Caregiver receipt of spousal care	9	9	8	.5
Caregiver health status				<.001
Excellent	15	12	8	
Very good	34	26	24	
Good	30	29	32	
Fair	15	22	25	
Poor	6	12	12	
Presence of formal care for the caregiving recipient	1	2	1	.04
Preventive clinical service*				
Influenza vaccination	61	69	68	.002
Cholesterol screening (N = 5,690)	79	78	76	.3
Mammogram (N = 5,690)	80	75	73	.04
Pap smear (N = 5,686)	70	62	58	.001
Prostate (N = 5,674)	76	76	66	.02
Self-breast exam (N = 5,688)	64	60	64	.4

* *Service provided in the past 2 years except for monthly self-breast exam.*

† *Standard errors are set in parentheses.*

Table 2. Unadjusted and Adjusted Odds Ratios (95% Confidence Interval) of the Association Between Caregiving Hours and Caregiver Receipt of Preventive Clinical Services

	Unadjusted Odds Ratios (95% CI)		Odds Ratios (95% CI), Adjusted for Variables Listed in Table 1	
Hours of Caregiving Provided per Week	1 to 14 Hours	>14 Hours	1 to 14 Hours	>14 Hours
Influenza vaccination in the past 2 years	1.44 (1.12 to 1.84)	1.32 (1.03 to 1.69)	1.30 (1.00 to 1.68)	0.97 (0.77 to 1.24)
Cholesterol screening in the past 2 years	0.95 (0.74 to 1.22)	0.84 (0.67 to 1.04)	1.00 (0.78 to 1.26)	0.87 (0.68 to 1.10)
Mammography in the past 2 years	0.75 (0.55 to 1.03)	0.68 (0.47 to 1.00)	0.99 (0.71 to 1.38)	1.04 (0.71 to 1.52)
Pap smear in the past 2 years	0.68 (0.52 to 0.90)	0.60 (0.42 to 0.84)	0.91 (0.70 to 1.19)	0.97 (0.69 to 1.37)
Prostate cancer screening in the past 2 years	0.98 (0.69 to 1.41)	0.59 (0.40 to 0.86)	1.16 (0.81 to 1.66)	0.71 (0.47 to 1.07)
Self-breast exam every month	0.84 (0.62 to 1.15)	1.00 (0.78 to 1.28)	0.91 (0.67 to 1.24)	1.10 (0.84 to 1.44)

Referent group is spouses who provided no caregiving.
CI, confidence interval.

us to illustrate only models with caregiver health status. Due to concerns that we were overadjusting by including presence of formal care and caregiver receipt of spousal care, we created models that did not adjust for these variables, but this had little effect on the results (results not shown). Finally, in sensitivity analyses, we also adjusted for caregiver ADLs and IADLs, additional caregiving for dependents, hospitalizations, length of hospitalizations, and outpatient physician visits, but addition of these variables did not result in different associations between caregiving and performance of a preventive clinical service, and were not included in the final models. No interactions were significant, including those between net worth and health services or gender and health services. All analyses were performed using STATA statistical software, release 7.0 (STATA Corporation, College Station, Tex; 2001).

RESULTS

Of the 11,394 participants, 10,328 (91%) did not provide care to their spouses, 622 (5%) provided care 1 to 14 hours per week, and 444 (4%) provided more than 14 hours of care per week. Characteristics of participants by caregiving category are shown in Table 1. Older persons (>75 years of age), women, African Americans, and people who had lower education, net worth, and employment rates, more comorbidities, and lower self-reported caregiver health status were more likely engaged in spousal caregiving. Rates of preventive service use across caregiving categories were relatively high (Table 1).

Table 2 shows the unadjusted and adjusted odds of receiving a health care service by caregiving category. In unadjusted analyses, provision of greater than 14 hours of caregiving per week was associated with significantly higher odds of the caregiver receiving influenza vaccination and slightly lower odds of the caregiver receiving cholesterol screening, mammography, Pap smear, and prostate examination, although only the association between Pap smears and prostate exams was significant. Greater intensity of caregiving was not associated with performance of self-breast exam. After adjustment for other covariates listed in Table 1, there were no significant associations between caregiving and caregiver receipt of health service measures (Table 2).

DISCUSSION

Despite literature suggesting that caregivers frequently sacrifice their own health and well-being because of the demands of providing care, we found no evidence that caregiving was associated with higher or lower receipt of preventive clinical services for the caregiver. This suggests that the association between caregiving and increased mortality is mediated through other pathways warranting further investigation.

Our results are consistent with previous reports that found little association between caregiving and preventive health measures for the caregiver, either those care practices performed primarily outside the medical office or in the office.[3,11,12,17,18] It is possible that this older group of persons has firmly established health routines that are minimally impacted by relatively new demands such as caregiving. It is also possible that any caregiving demands are balanced by increased contact with the health care system through visits for the impaired family member. Contact with the health system can increase perception of the need for services such as influenza vaccination, cholesterol screening, mammography, Pap smear screening, and prostate examinations.[12] Such contact can also increase the opportunities for services that are relatively easy to administer, such as influenza vaccination. Finally, those who choose to become caregivers to begin with may have greater awareness of proper health behaviors and necessary services.

Our study has several limitations. Our analysis was cross-sectional, and it is possible that a "healthy worker" effect exists, where persons who are healthier are more likely to become caregivers.[18] Although the HRS survey is longitudinal, the previous and subsequent waves dropped questions pertaining either to informal care for spouses or clinical services, limiting our ability to examine caregiving and clinical service use over time. The HRS relies on self-reported

information for ADLs and IADLs, which may differ from performance-based measures of functioning. Similarly, our data on health service measures were obtained by self-report, which may underestimate actual services provided, particularly for cholesterol screening.[19] Finally, our conclusions do not apply to other outcomes such as quality of life, stress, and depression or other health behaviors such as exercise, smoking, and healthy eating.

We conclude that spousal caregiving is not associated with lower performance of preventive clinical services in the caregiver. Future investigations should focus on the association between caregiving and processes of health care delivery for caregiver chronic disease management and quality of life.

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