Depressive Symptoms Predict Cancer Caregivers’ Physical Health Decline

Kelly M. Shaffer, PhD

BACKGROUND: Cancer caregiving has been associated with worsening health among caregivers themselves, yet demographic and psychosocial predictors of their long-term health decline are less known. This study examines changes in caregivers’ physical health 2 to 8 years after their family members’ cancer diagnosis and prospective predictors of that change. METHODS: Caregivers (n = 664; mean age, 53.2 years) participated in a nationwide study at 2 (T1), 5 (T2), and 8 (T3) years after their family members’ cancer diagnosis. Physical health (12-item Medical Outcomes Study Short Form Health Survey Physical Component Scale) was assessed T1 through T3 as outcome. Predictors were self-reported at T1, including caregiver demographics (age, sex, education, income, relationship to patient, and employment status), patient cancer severity (from medical records), and caregiver psychosocial factors (caregiving stress, caregiving esteem, social support, and depressive symptoms). Latent growth modeling tested predictors of caregivers’ initial physical health and their physical health change across time. RESULTS: At T1, caregivers reported slightly better physical health than the US population (M = 51.22, P < .002), which declined over the following 6 years (M_slope = −0.27, P < .001). All demographic factors, patient cancer severity, and T1 caregiving stress were related to caregivers’ initial physical health (P ≤ .03). Higher depressive symptoms were unrelated to caregivers’ initial physical health, but were the only significant predictor of caregivers’ more rapid physical health decline (β = −0.02, P < .004). CONCLUSION: Findings highlight the unique contribution of caregivers’ depressive symptoms to their physical health decline. Assessing and addressing depressive symptoms among caregivers early in the cancer survivorship trajectory may help to prevent premature health decline among this important yet vulnerable population. Cancer 2017;123:4277-85. © 2017 American Cancer Society.

KEYWORDS: family caregiver, depression, prospective studies, self-report, social support.

INTRODUCTION

Family caregivers fill a critical role in cancer patients’ treatment success, yet caregiving experience increases caregivers’ own risk for long-term health decline.1-3 Psychosocial factors are known to play a significant role in caregivers’ physical health decline,4,5 but prospective studies of these effects have had limited time frames. With caregivers at risk for premature disease development relative to non-caregivers,1,6,10 interventions targeting vulnerable caregivers and addressing factors aggravating their physical health decline will be critical to reducing this health disparity. To inform this need, the current study examines a set of risk factors, both relatively stable demographic and more readily modifiable psychosocial factors, as predictors of cancer caregivers’ physical health decline 2 to 8 years after their family members’ cancer diagnosis.

Physical health decline is aggravated by prolonged stress, as when caregiving demands exceed perceived resources.7,8 Several caregiver demographic factors have been linked to greater caregiving stress and risk for premature morbidity, such as older age,2,6 female sex,2,6 less education,4,9 lower household income,4 and employment during caregiving.10 The caregiver being the patient’s spouse6,9 and the patient having high disease severity10,11 are also associated with higher physical health risk. Although the relations of these demographic and patient disease variables with caregivers’ health are well-documented through the acute phase after the cancer diagnosis and during treatment, most studies have only examined the first year after cancer diagnosis and treatment. Less is known about how these factors may identify caregivers at greatest risk for longer-term physical health decline.

Caregivers’ subjective experiences through the cancer trajectory also affect their physical health. Caregivers who report greater social support satisfaction12 and deriving self-esteem from caregiving4 exhibit more favorable physical health outcomes. Caregivers’ psychological distress is also a powerful predictor of their physical health decline. Caregivers’ perceived stress from the cancer experience has been found to relate to their physical health outcomes more strongly than objective measures of caregiving burden.6,13 Depressive symptoms have also been shown to be strongly related to physical morbidity among both healthy adults14,15 and caregivers specifically.9,12 Although limited in terms of the number of...
studies and maintenance of benefits, psychosocial interventions have helped improve these domains, suggesting that these factors are modifiable.\textsuperscript{16,17}

With cancer caregivers at risk for premature morbidity, three recent Institute of Medicine/National Academy of Medicine reports\textsuperscript{18-20} and a consensus statement from the National Cancer Institute and National Institute of Nursing Research\textsuperscript{21} have called for interventions to foster caregivers’ health. A better understanding of the risk factors for caregivers’ long-term health decline is needed to develop targeted assessment and intervention strategies that use clinical resources effectively. To that end, this prospective, observational study examined associations of a set of risk factors with physical health in a national sample of cancer caregivers 2 to 8 years after their family members’ cancer diagnosis. First, we examined the extent to which caregivers’ physical health changed across this period. Next, we tested the extent to which caregivers’ demographics, patient cancer severity, and psychosocial factors related to initial levels of physical health at 2 years post-diagnosis as well as their change in physical health over time.

PARTICIPANTS AND METHODS

Participants
The National Quality of Life Survey for Caregivers\textsuperscript{22} was designed to longitudinally assess the impact of cancer on the quality of life of family members and close friends who provide care for cancer survivors. Survivors were identified using multiple state cancer registries as having been diagnosed with one of the 10 most common cancers\textsuperscript{23} and were asked to nominate adult family or family-like individuals who provided consistent assistance during their cancer experience. Eligible caregivers were: 1) 18 years of age or older, 2) fluent in either English or Spanish, and 3) a resident of the United States.

Caregivers (N = 896) returned the baseline survey at 2 years postdiagnosis (T1; data collected 2003-2004). Follow-up data collection occurred at 5 years (T2; 2006-2007)\textsuperscript{24} and 8 years (T3; 2009-2010) postdiagnosis\textsuperscript{25}.

Caregivers were included in analyses (n = 664) if they provided complete data on all predictor variables at T1; each of the 664 included caregivers provided complete data for the physical health measure for at least 1 time point (Fig. 1). Included caregivers differed from those excluded (due to missing data on any predictor variable; n = 232) on the following predictor variables reported at T1: excluded caregivers were older [M\textsuperscript{ex} = 58.69 excluded vs 53.14 included; t(861) = -5.47, P < .001; d = 0.37] and a greater proportion of the excluded sample reported educational attainment at a high school diploma or less [32.2% vs 23.0%; \chi^2(1,875) = 7.16, P = .01; \phi = 0.09] and being unemployed [35.9% vs 23.0%; \chi^2(1884) = 14.13, P < .001; \phi = 0.13]. Compared with included caregivers, those excluded also reported poorer physical health at T1 [M\textsuperscript{ex} = 48.42 vs 51.24; t(830) = 3.22, P = .001; d = 0.22] and T2 [M\textsuperscript{ex} = 48.27 vs 50.51; t(458) = 2.16, P = .03; d = 0.20].

Procedure
This prospective, observational study complied with regulations of the Emory University Institutional Review Board. Nominated caregivers received a packet including...
an introduction letter, the survey, a self-addressed stamped envelope, and compensation (prepaid calling card at T1; $10 gift cards at T2, T3). Caregivers self-reported all measures on paper. Informed consent was evidenced by returning the completed survey. For each time point, 2 cycles of mailing and follow-up telephone calls were made across the 8-week data collection period.

**Measures**

**Caregiver physical health**

At each time point, caregivers self-reported their levels of physical health using the 12-item Medical Outcomes Study Short Form Health Survey (MOS-SF-12). The physical health component score represents a weighted composite of physical functioning, physical limitations to role requirements, bodily pain, and general health subscales. Scores were normalized (US population normalized \( M = 50 \)). Higher scores reflect better physical health. This measure has been widely used to measure physical health in studies of cancer caregivers.

**Demographic and patient cancer severity predictors of caregiver physical health**

Caregivers self-reported their age, sex, education, employment status, and household income at T1. Patients’ cancer diagnosis date, stage, and type were obtained from the state cancer registry at T1. The patient’s cancer severity was based on mortality rates calculated from cancer type, stage, and time since diagnosis. Higher scores reflect greater severity of illness.

**Psychosocial predictors of caregiver physical health**

Caregivers self-reported the following measures at T1.

- **Caregiving stress.** The extent to which caregivers felt overwhelmed by providing care to their family member was measured using the 4-item Stress Overload subscale of the Pearlin Stress Scale. Response options ranged from “Not at All” (1) to “Completely” (4). Higher mean scores indicate greater subjective caregiving stress. This scale has shown good internal consistency in previous cancer caregiver samples (Cronbach’s \( \alpha = 0.79-0.80 \)) and in the current sample (Cronbach’s \( \alpha = 0.81 \)).

- **Caregiver esteem.** Caregivers’ self-esteem related to providing care to their family member was assessed using the 7-item Caregiver Esteem subscale of the Caregiving Reaction Assessment. Response options ranged from “Strongly Disagree” (1) to “Strongly Agree” (5). Higher mean scores indicate greater caregiver esteem. This scale has shown good internal consistency in previous cancer caregiver samples (Cronbach’s \( \alpha = 0.82 \)) and in the current sample (Cronbach’s \( \alpha = 0.73 \)).

- **Social support.** The extent to which caregivers perceived that emotional, informational, and instrumental support were available to them was measured using the 6-item version of the Interpersonal Support Evaluation List. Response options ranged from “Definitely False” (1) to “Definitely True” (4). Higher mean scores indicate greater perceived social support availability. This measure has shown good internal consistency in dementia caregiver samples (Cronbach’s \( \alpha = 0.79 \)) and in the current sample (Cronbach’s \( \alpha = 0.77 \)).

- **Depressive symptoms.** The extent to which family caregivers experienced neurovegetative, affective, and interpersonal symptoms associated with depression was assessed using the 20-item Center for Epidemiologic Studies Depression (CES-D) scale. Response options ranged from “Rarely or None of the Time” (0) to “Most or All of the Time” (4). Higher total scores indicate greater overall depressive symptomatology. This measure has shown good internal consistency in cancer caregiver samples (Cronbach’s \( \alpha = 0.87 \)) and in the current sample (Cronbach’s \( \alpha = 0.93 \)).

**Analysis Plan**

Descriptive information for study variables is presented in Table 1. For all analyses, \( P < .05 \) was considered statistically significant. The central aims of the study were analyzed using latent growth modeling (LGM) using a structural equation modeling framework (Mplus 7). Missing physical health data were accounted for by full information maximum likelihood estimation. Although most unplanned “missingness” in psychosocial research is at some level missing not at random, we sought to reduce bias produced by this mechanism by including variables associated with missingness in our models.

First, a measurement model of the LGM estimating caregivers’ physical health trajectory was tested. The LGM estimated 2 latent parameters: initial level of health (intercept) and change in health (slope) across the 3 assessments. Linear change by year was estimated by fixing loadings for the 3 physical health indicators to the intercept latent variable to 1 and to the slope latent variable to 0, 3, and 6 for T1 through T3, respectively. To facilitate interpretation, physical health scores were centered at 50 (ie, normalized mean for the US population), and continuous predictor variables were centered to the sample mean.
TABLE 1. Sample Demographics for National Sample of Cancer Caregivers (n = 664)

<table>
<thead>
<tr>
<th>Mean (Standard Deviation)</th>
<th>Range</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, y</strong></td>
<td>53.20 (12.59)</td>
<td>18.32-89.98</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Men</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Women</td>
<td>482 (66.1)</td>
<td>511 (77.0)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Some college or more</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$40,000 or more</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Relation to patient</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Spouse</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Employed</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unemployed</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Patient cancer severity</strong></td>
<td>0.16 (0.23)</td>
<td>0-0.94</td>
</tr>
<tr>
<td><strong>Subjective caregiving stress</strong></td>
<td>1.61 (0.62)</td>
<td>1-4</td>
</tr>
<tr>
<td><strong>Caregiving esteem</strong></td>
<td>4.38 (0.50)</td>
<td>2.43-5</td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td>3.39 (0.63)</td>
<td>1-6</td>
</tr>
<tr>
<td><strong>Depressive symptoms</strong></td>
<td>10.86 (10.32)</td>
<td>0-55</td>
</tr>
<tr>
<td><strong>Physical healtha</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2 years postdiagnosis (T1)</td>
<td>51.24 (10.06)b</td>
<td>8.19-70.97</td>
</tr>
<tr>
<td>5 years postdiagnosis (T2)</td>
<td>50.51 (9.24)c</td>
<td>16.53-69.16</td>
</tr>
<tr>
<td>8 years postdiagnosis (T3)</td>
<td>49.44 (9.50)d</td>
<td>19.95-69.98</td>
</tr>
</tbody>
</table>

a Superscript letters correspond to results from single-sample t tests comparing raw sample means with the US normalized mean of 50. The pattern of findings using t tests did not differ from that using latent growth modeling and full information maximum likelihood estimation to compare means to 50.

b T1 sample mean was significantly greater than 50 (t(650) = 3.14, P = .002).

c T2 sample mean was not significantly different from 50 (t(341) = 1.02, P = .31).

d T3 sample mean was not significantly different from 50 (t(319) = −1.05, P = .29).

Next, structural equation modeling was used to test the relations of risk factors measured at T1 with caregivers’ initial levels and change in physical health. For both models, fitness was evaluated based on 4 model fit indices: χ²/t > .05, root mean square error of approximation (RMSEA) < 0.06, comparative fit index (CFI) > 0.95, and the standardized root mean square residual (SRMR) < 0.08 indicating adequate model fit to the data.43,44

RESULTS

Caregivers included in the current data analysis returned surveys from 34 states. Specifically, 40% of caregivers responded from the Northeast region, 39% from the Midwest, 18% from the South, and 3% from the West. Participating caregivers overall were middle-aged, primarily women, and relatively well-educated and affluent (Table 1). Most caregivers were the patient’s spouse and were employed. Overall, caregivers reported that caregiving was “somewhat” stressful, yet boosted their self-esteem, and that social support was “somewhat” available. Caregivers’ average reported depressive symptoms fell below the clinical cutoff of 1646 and were comparable to those seen among other studies of cancer caregivers.44,45

As shown in Figure 1, missingness on the outcome variable of physical health ranged from 2% at T1 to 52% at T3, with 68% of the sample missing complete data for the outcome variable for at least 1 time point. Correlates of missingness were examined: there was no correlate of missingness at T1 with any study variable (P > .06); compared with those with missing data, caregivers with data available at T2 and T3 were older by approximately 3 years and were 1.2 times more likely to be the patients’ spouse (P < .003), but there was no other correlate of missingness (P > .05). Full information maximum likelihood, standard to MPlus 7,37 incorporates data from correlates of missingness included in the model to reduce bias in estimates.

Caregivers’ Physical Health 2 to 8 Years Postdiagnosis

First, the measurement model of the change in caregivers’ physical health over time (LGM) was tested for a model fit. The measurement model fit the data: χ²(1) = 0.13, P = .71; RMSEA = 0; CFI = 1; SRMR = 0.004. Caregivers’ average initial level of physical health at 2 years postdiagnosis was higher than the normalized mean for the US population of 50 (M = 1.22; 95% confidence interval [CI] = 0.46 to 1.98; P = .002), and this varied between caregivers (χ² = 69.25; 95% CI = 52.55 to 85.95; P = .002). On average, caregivers reported a decline in their physical health by approximately one-quarter point per year (M = −0.27; 95% CI = −0.41 to −0.12; P < .001). The resulting decrease of approximately 1.5 points over the 6 years of the study represents a small effect (d = 0.16).46 Caregivers did not vary significantly in their rate of physical health decline (χ² = 0.36; 95% CI = −0.53 to 1.26; P = .43). Caregivers’ initial level of physical health was unrelated to their rate of...
change in physical health (unstandardized estimate = -1.63; 95% CI = -4.93 to 1.68; \( P = .34 \)).

**Predicting Caregivers’ Physical Health**

Next, the fit of the structural equation model predicting caregivers’ initial level and change in physical health by risk factors was tested (Fig. 2). The specified model fit the data according to 3 model fit indices: RMSEA = 0.04; CFI = 0.99; SRMR = 0.08; yet the \( \chi^2 \) index indicated suboptimal fit \( \chi^2(12) = 24.25, \ P = .02 \). Because this index is sensitive to large sample size and the current model drew from 664 participants, the model was accepted based on adequate fit to the alternative fit indices. Path estimates are shown in Table 2; model identification and significant paths are shown in Figure 2.

**Predicting Initial Level of Physical Health**

Several factors related to caregivers’ initial level of physical health 2 years postdiagnosis. Among the demographic factors and patient cancer severity, caregivers who were older, were men, were not the caregivers’ spouse, were unemployed, had a high school education or less, had a household income under $40,000 per year, and provided care to a patient with a better cancer prognosis reported poorer initial physical health. Regarding psychosocial factors, only higher subjective caregiving stress was concurrently related to lower caregiver initial health.

**Predicting Change in Physical Health**

Regarding change in caregivers’ physical health 2 to 8 years after the diagnosis, only caregivers’ depressive symptoms was a significant predictor. Caregivers who reported higher depressive symptoms 2 years postdiagnosis showed more rapid physical health decline over the subsequent 6 years. No other factors predicted caregivers’ change in physical health. With all other factors held constant at the sample mean, a caregiver who reported high depressive symptoms (ie, CES-D score 0.5 SD above average) would be expected to show physical health decline at twice the rate of a caregiver with an average level of depressive symptoms (Fig. 3).

**DISCUSSION**

This study documents the longest prospective examination of the effects of demographic, patient cancer severity, and psychosocial factors on cancer caregivers’ physical health to date. Caregivers’ physical health at 2 years postdiagnosis was slightly higher than the national mean; however, that advantage dissipated over the 6 years that followed, as caregivers experienced a small yet reliable decline in self-reported health. Among a comprehensive set of potential risk factors, only caregivers’ depressive symptoms prospectively predicted their physical health decline from 2 to 8 years postdiagnosis.

Caregivers’ physical health started somewhat higher and declined less rapidly than documented in previous studies using the SF-12 with cancer caregivers during the
patients’ active treatment phase. This may reflect both improved sense of physical health after the acute diagnosis and treatment phase, as well as the fact that larger population-based studies of caregivers tend to show better physical health outcomes relative to samples from smaller and interventional studies. At 2 years after the patients’ cancer diagnosis, caregivers’ initial health was associated primarily with the relatively fixed demographic factors and patients’ cancer severity. Our findings that caregivers who were older and of lower socioeconomic status reported poorer physical health at T1 are consistent with the literature. Several other findings of ours are inconsistent with the literature. For example, caregivers who were men, were not the patients’ spouse, and had better patient prognosis also reported poorer physical health at T1. These discrepant effects were small, which fits with findings from a meta-analytic study showing that, when caregiver characteristics are associated with their own self-reported physical health, effect sizes were typically minimal. In contrast with the demographic risk factors, all of which were related to initial physical health, caregivers’ perceived stressfulness of the cancer experience was the only psychosocial risk factor concurrently related to caregivers’ physical health. Caregiving responsibilities can be complicated by the caregiver being in poor physical condition, suggesting that caregivers’ own physical health may represent an important contextual characteristic relevant to the perceived stress of caregiving. Perhaps most striking, T1 depressive symptoms—although not concurrently related with physical health—were the only predictor of caregivers’ physical health decline, affirming that caregivers’ early depressive symptoms have downstream effects on their physical health as long as 6 years later. Our findings are consistent with the literature demonstrating that caregiver demographic characteristics have been more consistently associated with caregivers’ concurrent physical health reports, whereas psychosocial variables have predicted caregivers’ longer-term physical health changes. The 1.28-point predicted difference between the caregiver with high versus low depressive symptoms 8 years postdiagnosis (Fig. 3), at the population level, translates roughly to 6% higher total health care expenditures, 9% higher rate of inpatient hospitalizations, and 5% higher rate of outpatient hospital visits for the caregiver with a greater number of symptoms. Adverse effects of depression on physical health have been well-documented in the general population. These findings extend evidence to the cancer caregiving context, known to have many psychosocial

**TABLE 2. Path Estimates**

<table>
<thead>
<tr>
<th>Predictors of initial level of physical health (intercept)</th>
<th>B</th>
<th>95% Confidence Interval</th>
<th>P</th>
<th>Standardized β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>−0.25</td>
<td>−0.31 to −0.18</td>
<td>&lt;.001</td>
<td>−0.36</td>
</tr>
<tr>
<td>Sex</td>
<td>1.93</td>
<td>0.33 to 3.52</td>
<td>.02</td>
<td>0.11</td>
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<tr>
<td>Education</td>
<td>3.28</td>
<td>1.58 to 4.97</td>
<td>&lt;.001</td>
<td>0.16</td>
</tr>
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<td>Household income</td>
<td>3.34</td>
<td>1.49 to 5.19</td>
<td>&lt;.001</td>
<td>0.16</td>
</tr>
<tr>
<td>Relation to patient</td>
<td>2.45</td>
<td>0.78 to 4.11</td>
<td>.004</td>
<td>0.14</td>
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<tr>
<td>Employed</td>
<td>2.50</td>
<td>0.67 to 4.33</td>
<td>.01</td>
<td>0.12</td>
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<tr>
<td>Patient cancer severity</td>
<td>5.49</td>
<td>2.47 to 8.50</td>
<td>&lt;.001</td>
<td>0.15</td>
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<tr>
<td>Subjective caregiving stress</td>
<td>−1.38</td>
<td>−2.64 to −0.12</td>
<td>.03</td>
<td>−0.10</td>
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<tr>
<td>Caregiving esteem</td>
<td>0.55</td>
<td>−0.86 to 1.95</td>
<td>.45</td>
<td>0.03</td>
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<td>Social support</td>
<td>0.60</td>
<td>−0.71 to 1.92</td>
<td>.37</td>
<td>0.04</td>
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<td>Depressive symptoms</td>
<td>−0.02</td>
<td>−0.10 to 0.06</td>
<td>.62</td>
<td>−0.02</td>
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</table>

<table>
<thead>
<tr>
<th>Predictors of change in physical health (slope)</th>
<th>B</th>
<th>95% Confidence Interval</th>
<th>P</th>
<th>Standardized β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.003</td>
<td>−0.01 to 0.02</td>
<td>.68</td>
<td>0.05</td>
</tr>
<tr>
<td>Sex</td>
<td>−0.11</td>
<td>−0.45 to 0.23</td>
<td>.51</td>
<td>−0.07</td>
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<tr>
<td>Education</td>
<td>0.35</td>
<td>−0.71 to 0.02</td>
<td>.06</td>
<td>0.18</td>
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<tr>
<td>Household income</td>
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<td>−0.29 to 0.49</td>
<td>.62</td>
<td>0.06</td>
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<tr>
<td>Relation to patient</td>
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<td>.25</td>
<td>−0.12</td>
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<tr>
<td>Employed</td>
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<td>−0.54 to 0.25</td>
<td>.46</td>
<td>−0.08</td>
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<tr>
<td>Patient cancer severity</td>
<td>−0.04</td>
<td>−0.67 to 0.60</td>
<td>.91</td>
<td>−0.01</td>
</tr>
<tr>
<td>Subjective caregiving stress</td>
<td>−0.04</td>
<td>−0.31 to 0.24</td>
<td>.79</td>
<td>−0.03</td>
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<tr>
<td>Caregiving esteem</td>
<td>−0.20</td>
<td>−0.50 to 0.11</td>
<td>.20</td>
<td>−0.12</td>
</tr>
<tr>
<td>Social support</td>
<td>−0.03</td>
<td>−0.31 to 0.25</td>
<td>.83</td>
<td>0.02</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>−0.02</td>
<td>−0.04 to 0.01</td>
<td>.004</td>
<td>−0.30</td>
</tr>
</tbody>
</table>

Sex = 1 for male, 2 for female. Education = 0 for high school or less, 1 for college or more. Household income = 0 for <$40,000, 1 for ≥$40,000. Relation to patient = 0 for not spouse, 1 for spouse. Employed = 0 for not employed, 1 for employed.
stressors and challenges, and highlight the importance of depression specifically to caregivers’ premature physical health decline.

Depressive symptoms are common among cancer caregivers. Implementing caregiver depression screening and increasing caregivers’ access to effective depression treatments may mitigate the premature physical health decline endemic to cancer caregiving. To date, caregiver distress screening implementation has been limited, yet could be more widely adopted by capitalizing on current efforts to implement routine patient distress screening. Successful examples of caregiver mental health assessment and referral systems built from patient distress screening models exist, with technology-based assessment using brief and straightforward questions to assess whether a caregiver has been experiencing depression or low mood.

To improve health outcomes, screening must link caregivers who report high depressive symptoms with timely, effective interventions. Existing psychosocial interventions with caregivers have shown limited effect on caregiver depressive symptoms. Developing and refining interventions to successfully address caregivers’ depressive symptoms during the acute cancer phase must be a research priority, not only to improve caregivers’ quality of life, but also to address the notable health disparities between adults with versus without caregiving experience. To address this double aim, interventions with caregivers may seek to emphasize strategies shown to improve both mental and physical health, such as relaxation, meditation, and exercise.

The limitations of this study restrict the generalizability of the findings. The study sample was primarily non-Hispanic white and well-educated. Moreover, caregivers included in the analyses were younger, healthier, and of higher socioeconomic status than those excluded, and younger and nonspousal caregivers were more likely to have missing data at follow-up, although all of the differences were small. An analysis of the long-term physical health sequelae of caregiving should be conducted among caregivers of other ethnic groups and those with fewer socioeconomic resources, because health disparities known to exist among these groups are likely amplified by the additive stress from caregiving. Finally, variables were self-reported and possibly biased by social desirability, and the SF-12 represents a very general measure of physical health quality of life. Future study of caregivers’ health may seek to replicate findings with more specific, objective markers of health. Assessing biomarkers, such as genome expression, proinflammatory cytokines and telomerase activity, will improve our understanding of biological mechanisms by which caregivers’ health is affected by the caregiving experience.

This study provides novel information regarding cancer caregivers’ long-term physical health decline, with the longest follow-up to date of caregivers’ physical health following providing care to a loved one with cancer. Notably, only caregivers’ higher depressive symptoms predicted their accelerated physical health decline from 2 to 8 years following the patients’ diagnosis. Providing effective, targeted, and timely psychosocial care for cancer caregivers around the time of their relative’s diagnosis and treatment may help to prevent premature health decline among this important yet vulnerable population.

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CONFLICTS OF INTEREST DISCLOSURES

The authors made no disclosure.

AUTHOR CONTRIBUTIONS

Kelly M. Shaffer: project conceptualization, development of methodology, formal data analysis, resource provision, data management, writing (drafting and revision), visualization, and manuscript supervision. Youngmee Kim: conceptualization, development of methodology, investigation process, resource provision, data management, writing (drafting and revision), visualization, manuscript supervision, and funding acquisition. Charles S. Carver: conceptualization, revision and editing, and manuscript supervision. Rachel S. Cannady: investigation process, data management, revision and editing, project administration, and funding acquisition.

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