



# Cancer Hospice Caregivers' Self-care Behaviors

## *The Role of Caregiving Tasks, Burden, and Mental Health*

Djin L. Tay, PhD, RN ○ Maija Reblin, PhD ○ Eli Iacob, PhD ○  
Kristin G. Cloyes, PhD, MN, RN ○ Megan C. Thomas Hebdon, PhD, DNP, RN, FNP-C ○  
Miranda Reynaga, BS ○ Kathi Mooney, PhD, RN ○ Lee Ellington, PhD

Cancer hospice family caregivers provide intensive support for patients at the end of life, sometimes at the expense of self-care. This secondary analysis examined the role of caregiving burden, activities of daily living, and mental health on self-care behaviors among cancer hospice family caregivers. Logistic regression models were adjusted for sociodemographic and caregiver characteristics, and model fit was evaluated with Hosmer-Lemeshow tests. Participants (N = 86) were mostly women (n = 62, 72.09%), White (n = 76, 88.37%), and spousal caregivers (n = 44, 51.16%). Almost half reported not getting enough rest (47.67%), time to exercise (47.67%), or time to slow down and rest when feeling ill (46.51%). Caregivers with better mental health

reported being more likely to have enough time to exercise (adjusted odds ratio [OR<sub>adj</sub>], 1.15, [1.05, 1.26]; P = .004), rest (OR<sub>adj</sub>, 1.11, [1.01, 1.22]; P = .031), and slow down when ill (OR<sub>adj</sub>, 1.16, [1.04, 1.30]; P = .010). Controlling for sociodemographic and caregiver characteristics, men caregivers had 88% lower odds of being able to rest when ill (OR<sub>adj</sub>, 0.12, [0.03, 0.52]; P = .005) compared with women. Number of care tasks, not caregiving burden, was associated with self-care behaviors. Findings provide a preliminary understanding of factors related to caregiver self-care and have implications for increased assessment of caregiver mental health and self-care needs to better support family-oriented hospice care.

**Djin L. Tay, PhD, RN**, is assistant professor, College of Nursing, University of Utah, Salt Lake City.

**Maija Reblin, PhD**, is associate professor, Cancer Control and Population Health Sciences, University of Vermont Cancer Center, Burlington.

**Eli Iacob, PhD**, is assistant professor, College of Nursing, University of Utah, Salt Lake City.

**Kristin G. Cloyes, PhD, MN, RN**, is professor, School of Nursing, Oregon Health & Science University, Portland.

**Megan C. Thomas Hebdon, PhD, DNP, RN, FNP-C**, is assistant professor, School of Nursing, University of Texas at Austin.

**Miranda Reynaga, BS**, is PhD student, Department of Psychology, University of Michigan, Ann Arbor.

**Kathi Mooney, PhD, RN**, is distinguished professor, University of Utah; and co-leader, Cancer Control and Population Sciences, Huntsman Cancer Institute, Salt Lake City, UT.

**Lee Ellington, PhD**, is professor, College of Nursing, University of Utah, Salt Lake City.

Address correspondence to Djin L. Tay, PhD, RN, College of Nursing, University of Utah, 10 S 2000 E, Salt Lake City, UT 84112 (djin.tay@nurs.utah.edu).

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### KEY WORDS

cancer, caregivers, hospice care, mental health, self-care

Cancer caregivers provide hands-on assistance, nursing care, and care coordination to patients,<sup>1</sup> and a third of cancer caregivers provide 20 or more hours of care per week—an amount comparable with caregivers of other conditions.<sup>2</sup> Hospice family caregivers (HFCs) bear the overwhelming responsibility for end-of-life care, which is emotionally and physically burdensome and characterized by complex, high-intensity care.<sup>3,4</sup> High caregiving burden has been associated with lower engagement in self-care among caregivers of advanced cancer patients,<sup>5</sup> and research supports that mental health toll on caregivers' physical health may be stronger for cancer caregivers compared with caregivers of older adults in the general population.<sup>2</sup>

Self-care behaviors are actions that maintain a state of health and well-being.<sup>6</sup> According to Orem's<sup>6</sup> self-care theory, deficits in self-care occur when care demands (such as caregiving burden and intensity) outweigh self-care ability. Self-care can include *maintaining* general health such as engaging in physical activity or getting enough rest, or *managing* current health issues, such as regularly taking medications for chronic conditions.<sup>6</sup> Studies support that self-care behaviors vary by sex,<sup>7</sup> age and income,<sup>8</sup> cultural attitudes toward caregiving,<sup>9</sup> and situational factors such as employment,<sup>10</sup> social support, and access to health care



resources during caregiving.<sup>9-11</sup> Previous research with advanced cancer caregivers and other caregiver populations have indicated a strong association between caregiving burden and behaviors associated with *maintaining* health such as lower fruit and vegetable consumption, and less overall engagement in self-care, in addition to mental health status.<sup>2,5,11</sup> In other caregiving populations, caregiving burden has also been observed to negatively impact medication and dietary adherence among diabetic caregivers<sup>12</sup> and treatment for acute health conditions,<sup>13</sup> suggesting that caregiving may pose a barrier for maintaining and managing health needs. This is important as caregivers' needs are seldom assessed in practice and caregiver-focused interventions are inadequately implemented across settings.<sup>14</sup>

Thus, the purpose of this study was to describe the prevalence of self-care behaviors (*health maintenance and management*) among cancer HFCs and examine the influence of demographics, caregiving characteristics, and mental health on HFCs' engagement in self-care behaviors. Specifically, we hypothesized that greater perceived caregiver burden and lower mental health would be associated with lower engagement in health maintenance and management behaviors.

## METHODS

This secondary data analysis examined baseline data from  $N = 86$  HFCs of patients with cancer from 4 states (Florida, Massachusetts, Ohio, and Utah). Adult kin and nonkin HFCs were recruited from home hospices for the study between May 1, 2018, and March 3, 2020. Hospice patients included any primary diagnosis of cancer—most common diagnoses of patients cared for by HFCs in this sample included cancers of the lung, breast, pancreas, and brain. This study was approved by the University of Utah Institutional Review Board. Informed consent was obtained from participants before administering questionnaires. Details of the recruitment process and other measures are reported elsewhere.<sup>15</sup>

## Measures

### Participant Characteristics

Baseline questionnaires assessed HFCs' age, sex, marital status, race, ethnicity, employment status, and caregiver characteristics (relationship to patient, co-residence with patient). HFCs' provision of support in 8 activities of daily living (ADLs) was also assessed: feeding, toileting, selecting clothes, grooming, continence care, dressing, bathing, and ambulating/transferring. Caregivers' overall physical health<sup>16</sup> and comorbidities (Charlson Comorbidity Index) were assessed as well.<sup>17</sup>

### Self-care

To reduce participant burden, 6 binary items (yes/no) from a study conducted by Schulz and colleagues<sup>18</sup> were used

to assess self-care behaviors. *Health maintenance* items included “I have enough time to exercise,” “I am getting enough rest in general,” and “I am able to slow down and get enough rest when I am sick,” and *health management* items included “I forget to take my medication,” “I have enough time to go to the physician,” and “I have missed at least one physician appointment in the last six months.” The Kuder-Richardson test for binary variables showed that internal consistency for the health maintenance and health management behavior items were 0.79 and 0.66, respectively, for the sample.

### Caregiver Burden

Perceived caregiver burden was assessed with the 12-item Zarit Burden Interview,<sup>19</sup> a scale using Likert-type responses ranging from “never” to “almost always,” with scores ranging from 0 to 48 and higher scores indicating greater burden. Scores higher than 13 suggest the presence of caregiving burden.<sup>20</sup> The internal consistency of the Zarit Burden Interview for this sample was  $\alpha = .89$ .

### Mental Health

Mental health was assessed with the mental health subscale (4 items) of the Patient-Reported Outcomes Measurement Global scale using  $T$  scores,<sup>16</sup> which reference a standardized population mean of 50 and an SD of 10. Higher scores indicate better mental health. Internal consistency of the mental health subscale in this sample was acceptable (Cronbach  $\alpha = 0.786$ ).

### Analysis

Descriptive statistics and multivariable logistic models were used for the analysis. For participants with less than 30% missing responses, mean scores based on available items were imputed. Adjusted odds ratios, 95% confidence intervals, and  $P$  values were reported. In addition, Hosmer-Lemeshow tests were conducted to assess the goodness of fit of models, and Nagelkerke's pseudo- $R^2$  was reported. Significance was set at  $P < .05$ . All analyses were conducted in SPSS version 27.

## RESULTS

Table 1 presents the descriptive statistics for the sample ( $N = 86$ ). Most HFCs in the sample were women (72.09%), either married or in a committed relationship (72.09%), and White ( $n = 76$ , 88.37%). Just over half were caring for a spouse or partner ( $n = 44$ , 51.16%). The mean (SD) age was 57.80 (14.34) years. Over three-quarters of HFCs resided with patients. Two-thirds of HFCs provided care for more than a year, and a large majority (84.88%) identified at least one other person assisting with care. Hospice family caregivers assisted with a mean (SD) of 4.53 (3.05) ADLs. Hospice family caregivers' physical and mental health were lower than the US population average



**TABLE 1** Characteristics of Cancer Hospice Family Caregivers (N = 86)

Items	n (%)
Demographic characteristics	
Age, mean (SD), y	57.80 (14.34)
Sex	
Women	62 (72.09)
Men	24 (27.91)
Marital status	
Married or in committed relationship	67 (77.91)
Single, separated, divorced, or widowed	19 (22.09)
Race	
American Indian or Alaska Native	1 (1.16)
Asian	1 (1.16)
Black or African American	4 (4.65)
Native Hawaiian or Pacific Islander	0 (0)
White	76 (88.37)
Multiple races	4 (4.65)
Ethnicity	
Hispanic/Latino	8 (9.30)
Non-Hispanic/Latino	78 (90.70)
Employment	
Not employed	35 (40.70)
Employed, part-time	15 (17.44)
Employed, full-time	36 (41.86)
Caregiver characteristics	
Relationship to patient	
Spouse/partner	44 (51.16)
Child	33 (38.37)
Other relative or friend	9 (10.47)
Co-residence	
Yes	67 (77.91)
No	19 (22.09)
Length of caregiving, y	

(continues)

**TABLE 1** Characteristics of Cancer Hospice Family Caregivers (N = 86), Continued

Items	n (%)
<1	33 (38.82)
1-5	37 (43.53)
5+	15 (17.65)
Identified at least 1 other person providing care	73 (84.88)
Comorbidities (Charlson Comorbidity Index)	
0	63 (73.26)
1-2	18 (20.93)
3-4	3 (3.49)
>5	2 (2.32)
Caregiving burden (Zarit Burden Interview), mean (SD)	16.82 (9.10)
Activities of daily living assisted by caregiver	
Feeding	44 (52.38)
Toileting	50 (58.14)
Selecting clothes	52 (60.47)
Grooming	45 (52.94)
Continence care	44 (53.01)
Dressing	53 (63.86)
Bathing	38 (45.24)
Ambulating/transferring	58 (69.05)
Self-rated health	
Physical health (PROMIS physical health), mean (SD)	44.11 (5.75)
Mental health (PROMIS mental health), mean (SD)	45.35 (8.34)
Health maintenance self-care behaviors	
Enough time to exercise	
Yes	44 (51.16)
No	41 (47.67)
Missing	1 (1.16)
Getting enough rest in general	

(continues)



**TABLE 1** Characteristics of Cancer Hospice Family Caregivers (N = 86), Continued

Items	n (%)
Yes	44 (51.16)
No	41 (47.67)
Missing	1 (1.16)
Able to slow down and get enough rest if sick	
Yes	40 (46.51)
No	40 (46.51)
Missing	6 (6.98)
Health management self-care behaviors	
Forget to take my medication	
Yes	16 (18.60)
No	68 (79.07)
Missing	2 (2.33)
Enough time to go to physician	
Yes	62 (72.09)
No	23 (26.74)
Missing	1 (1.16)
Missed at least 1 physician appointment in the past 6 mo	
Yes	29 (33.72)
No	57 (66.28)

Abbreviation: PROMIS, Patient-Reported Outcomes Measurement.

(mean, 44.11 and 45.35, respectively), with a quarter reporting at least 1 comorbidity. Hospice family caregivers reported a mean (SD) burden score of 16.82/48 (9.10), with 70.93% (n = 61) reporting a score of 13 or more, indicating the presence of burden. The median number of hospice days before study enrollment was 22 days (interquartile range, 22 days).

### Self-care Behaviors

We found that approximately half of HFCs in our sample reported challenges with maintenance self-care behaviors. With regard to health maintenance, not having enough time to exercise and not getting enough rest in general were each endorsed by approximately 48% of caregivers. Health management–related self-care behaviors were less frequently endorsed as challenges. Not being able to slow down to get enough rest when they were sick was endorsed

by 46.51% of caregivers, not having enough time to go to the physician was endorsed by 26.74% of caregivers, and missing at least 1 physician appointment in the past 6 months was endorsed by 33.72% of caregivers. Full statistics are shown in Table 1.

### Logistic Regression Models

Tables 2 and 3 present results from the adjusted logistic regression models. We did not adjust models for length of hospice enrollment because length of hospice enrollment was not a predictor of self-care outcomes in bivariate analyses. Contrary to our hypotheses, perceived caregiving burden was not associated with self-care behaviors. However, a 1-point increase in mental health was associated with increased odds of getting enough time to exercise (adjusted odds ratio [OR<sub>adj</sub>], 1.15, [1.05, 1.26]; *P* = .004), getting enough rest in general (OR<sub>adj</sub>, 1.11, [1.01, 1.22]; *P* = .031), being able to slow down when sick (OR<sub>adj</sub>, 1.16, [1.04, 1.30]; *P* = .010), and having enough time to go to the physician (OR<sub>adj</sub>, 1.12, [1.02, 1.24]; *P* = .023). In addition, male HFCs had 88% lower odds of reporting that they were able to slow down and rest when they got sick (OR<sub>adj</sub>, 0.12, [0.03, 0.52]; *P* = .005), after adjusting for age, race/ethnicity, co-residence, employment status, and self-reported physical health.

### Caregiving Tasks vs Caregiving Burden

As self-care theory posits that deficits in self-care occur when caregiving demands outweigh self-care ability,<sup>6</sup> and the work of others has shown that high-intensity caregiving is associated with burden,<sup>21</sup> we replicated the models to investigate whether engagement in caregiving tasks (ie, ADLs) predicted self-care behaviors in post hoc analyses. We found that, in addition to replicating the findings with mental health, increased provision of ADLs was associated with deficits in engaging in 5 of the 6 self-care behaviors (Tables 4 and 5).

## DISCUSSION

This study is one of the few that has examined self-care behaviors among HFCs of cancer patients, a population of caregivers that are often engaged in high-intensity caregiving and who endorse high levels of physical and emotional caregiving burden.<sup>22</sup> In this study, approximately half of HFCs reported challenges in engaging in health maintenance self-care, whereas a minority were unable to engage in health management self-care, highlighting a subset of HFCs that may be at risk for self-care deficit. By definition, health maintenance self-care behaviors may be more difficult to keep up during caregiving because they require daily or weekly activities, compared with health management that may require only yearly or emergent attention. As such, some of our participants may not yet have been in the situation to address health management, which



**TABLE 2** Logistic Regression Models for Odds of Cancer Hospice Family Caregivers' Health Maintenance–Related Self-care Behaviors

Characteristic	Time to Exercise (N = 85)				Enough Rest in General (N = 85)				Slow Down and Get Rest When Sick (N = 80)			
	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>
Age	1.00	0.95	1.05	0.999	1.04	0.98	1.10	0.159	1.03	0.97	1.10	0.287
Sex												
Women (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Men	0.63	0.20	1.99	0.432	0.93	0.27	3.25	0.907	0.12	0.03	0.52	<b>0.005</b>
Race												
White, non-Hispanic (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Non-White or Hispanic	0.37	0.09	1.58	0.180	2.51	0.46	13.84	0.291	0.77	0.15	4.07	0.756
Co-residence												
No (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Yes	0.51	0.13	1.98	0.331	0.63	0.16	2.58	0.525	0.41	0.08	1.99	0.268
Employed												
No (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Part-time	2.29	0.43	12.32	0.334	0.33	0.06	1.88	0.212	0.22	0.03	1.59	0.134
Full-time	4.09	0.79	21.24	0.094	0.34	0.06	2.01	0.236	0.29	0.04	1.95	0.201
Physical health	0.97	0.86	1.08	0.535	1.13	1.00	1.28	0.051	1.06	0.92	1.22	0.407
Caregiver burden	0.98	0.91	1.05	0.615	0.98	0.90	1.06	0.541	0.98	0.90	1.06	0.605
Mental health	1.15	1.05	1.26	<b>0.004</b>	1.11	1.01	1.22	<b>0.031</b>	1.16	1.04	1.30	<b>0.010</b>
H-L test	$\chi^2(7) = 2.401, P = .934$				$\chi^2(7) = 16.735, P = .019$				$\chi^2(8) = 8.591, P = .378$			
Nagelkerke R <sup>2</sup>	33.1%				45.4%				49.6%			
Classification	70.6%				78.8%				73.8%			

Abbreviations: H-L test, Hosmer-Lemeshow test; OR<sub>adj</sub>, adjusted odds ratio; ref, reference; Sig, significance.  
<sup>a</sup>Bolded values indicate significance at the P < .05 level.

may explain the lower prevalence of impact on health management behaviors. However, neglecting regular health maintenance can increase the likelihood for the need to manage emergent health issues and cumulative effects of neglecting self-care,<sup>23</sup> and health maintenance such as exercise has been identified by caregivers as a self-care priority.<sup>24</sup>

Similar to findings in other cancer and noncancer caregiving populations, our findings supported the association between mental health and self-care.<sup>5,11,12,25</sup> This is important

as cancer and hospice caregiving is associated with great emotional distress,<sup>26,27</sup> and research suggests poorer mental health predicts later caregiving burden regardless of the time spent in caregiving.<sup>28,29</sup> Burden is also highly subjective, with nonlinear associations with caregiving intensity.<sup>21</sup> This may partially explain why, in contrast to the findings of others,<sup>5</sup> we did not observe associations of self-care with caregiving burden in this sample. More research is needed to identify the psychological mechanisms



**TABLE 3** Logistic Regression Models for Odds of Cancer Hospice Family Caregivers' Health Management–Related Self-care Behaviors

Characteristic	Forget to Take Medication N = 84				Enough Time to Go to Physician N = 85				Missed at Least 1 Physician Appointment in the Last 6 mo N = 86			
	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>
Age	1.03	0.97	1.10	0.315	1.00	0.95	1.05	0.855	1.04	0.98	1.10	0.231
Sex												
Female (ref)	—	—	—		—	—	—		—	—	—	
Male	3.10	0.63	15.37	0.165	1.25	0.38	4.13	0.715	2.00	0.52	7.68	0.315
Race												
White, non-Hispanic (ref)	—	—	—		—	—	—		—	—	—	
Non-White or Hispanic	0.61	0.11	3.46	0.577	1.35	0.32	5.77	0.686	0.32	0.07	1.52	0.153
Co-residence												
No (ref)	—	—	—		—	—	—		—	—	—	
Yes	0.46	0.08	2.81	0.400	0.40	0.11	1.49	0.170	0.25	0.05	1.31	0.102
Employed												
No (ref)	—	—	—		—	—	—		—	—	—	
Part-time	2.91	0.43	19.64	0.274	1.11	0.23	5.26	0.898	1.27	0.26	6.18	0.765
Full-time	0.82	0.11	6.19	0.844	2.79	0.55	14.26	0.217	0.36	0.06	2.03	0.246
Physical health	1.00	0.87	1.15	0.992	0.97	0.86	1.10	0.634	0.96	0.84	1.08	0.466
Caregiver burden	1.02	0.94	1.11	0.624	1.02	0.95	1.10	0.550	1.08	1.00	1.16	0.063
Mental health	0.92	0.82	1.03	0.158	1.12	1.02	1.24	<b>0.023</b>	0.93	0.85	1.02	0.108
H-L test	$\chi^2(8) = 4.005, P = .857$				$\chi^2(7) = 11.127, P = .133$				$\chi^2(8) = 3.956, P = .861$			
Nagelkerke R <sup>2</sup>	21.2%				20.8%				36.6%			
Classification	79.8%				74.1%				70.9%			

Abbreviations: H-L test, Hosmer-Lemeshow test; OR<sub>adj</sub>, adjusted odds ratio; ref, reference; Sig, significance.  
<sup>a</sup>Bolded values indicate significance at the P < .05 level.

that facilitate or impair caregiver engagement in self-care behaviors.

Caregivers facing multiple demands on their time may neglect their own needs when caring for patients with increased dependency. This is supported by our post hoc analyses that observed increased provision of ADLs was associated with the lack of engagement in both health maintenance–related and health management–related self-care. Our findings align with findings of others that

suggest that caring for patients with poorer functional status and greater caregiving needs is detrimental for caregivers' well-being<sup>30</sup> and has implications for the need to better support home hospice caregivers in their caregiving tasks.

Although research supports positive health outcomes associated with caregiving in the broader population,<sup>31</sup> studies have supported that caregivers providing high-intensity care and who cared for spouses were mostly likely to experience negative health outcomes such as developing increased



**TABLE 4** Relationship Between ADLs and Odds of Cancer Hospice Family Caregivers' Health Maintenance–Related Self-care Behaviors

Characteristic	Time to Exercise (N = 81)				Enough Rest in General (N = 81)				Slow Down and Get Rest When Sick (N = 78)			
	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>
Age	0.99	0.94	1.05	0.707	1.04	0.98	1.10	0.188	1.01	0.95	1.08	0.762
Sex												
Women (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Men	0.75	0.23	2.42	0.628	1.18	0.32	4.36	0.805	0.13	0.03	0.57	<b>0.007</b>
Race												
White, non-Hispanic (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Non-White or Hispanic	0.43	0.10	1.86	0.257	2.38	0.45	12.75	0.311	0.77	0.15	4.01	0.761
Co-residence												
No (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Yes	0.50	0.13	1.97	0.319	0.65	0.15	2.90	0.577	0.34	0.06	1.94	0.226
Employed												
No (ref)	—	—	—	—	—	—	—	—	—	—	—	—
Part-time	2.29	0.42	12.41	0.337	0.31	0.05	1.83	0.194	0.24	0.03	1.86	0.173
Full-time	5.00	0.87	28.58	0.072	0.37	0.06	2.47	0.304	0.33	0.04	2.72	0.300
Physical health	0.94	0.83	1.06	0.326	1.13	0.99	1.29	0.075	1.03	0.89	1.19	0.683
ADLs	0.82	0.68	0.98	<b>0.033</b>	0.81	0.66	0.99	<b>0.036</b>	0.76	0.60	0.95	<b>0.018</b>
Mental health	1.17	1.06	1.30	<b>0.003</b>	1.23	1.02	1.25	<b>0.025</b>	1.21	1.06	1.37	<b>0.004</b>
H-L test	$\chi^2(8) = 14.171, P = .077$				$\chi^2(7) = 6.081, P = .638$				$\chi^2(8) = 10.168, P = .253$			
Nagelkerke R <sup>2</sup>	38.1%				49.7%				54.3%			
Classification	71.6%				77.8%				78.2%			

Abbreviations: ADLs, activities of daily living; H-L test, Hosmer-Lemeshow test; OR<sub>adj</sub>, adjusted odds ratio; ref, reference; Sig, significance.  
<sup>a</sup>Bolded values indicate significance at the P < .05 level.

needs for medications, as well as increased severity of cardiovascular, arthritic, and pain conditions, and that women caregivers are at a greater risk for these negative health outcomes.<sup>23,32</sup> However, this study observed that male HFCs had lower odds of being able to slow down when they got sick regardless of perceived burden and engagement in ADLs. As men and women had similar mental health and caregiving burden scores in this sample,<sup>15</sup> this finding has implications for the potential lack of social support networks for male HFCs during end-of-life caregiving, as well as other

factors such as awareness for the need of self-care or competing demands such as employment.

Over half of Medicare decedents (50.4%) die on hospice care,<sup>33</sup> and in the general population, home has surpassed hospitals as the most common site of death among decedents who died of natural causes.<sup>34</sup> As the rates of home hospice continue to grow, so too will the burden on end-of-life caregivers who assume the majority of daily care of dying patients. Future research should investigate the long-term health implications associated with lack of self-care,



**TABLE 5** Relationship Between ADLs and Odds of Cancer Hospice Family Caregivers' Health Management–Related Self-care Behaviors

Characteristic	Forget to Take Medication N = 79				Enough Time to Go to Physician N = 81				Missed at Least 1 Physician Appointment in the Last 6 mo N = 81			
	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>	OR <sub>adj</sub>	Lower	Upper	Sig <sup>a</sup>
Age	1.03	0.97	1.10	0.328	0.98	0.93	1.04	0.554	1.03	0.97	1.09	0.403
Sex												
Female (ref)	—	—	—		—	—	—		—	—	—	
Male	2.94	0.60	14.45	0.185	1.36	0.40	4.61	0.618	1.61	0.40	6.44	0.503
Race												
White, non-Hispanic (ref)	—	—	—		—	—	—		—	—	—	
Non-White or Hispanic	0.73	0.13	4.19	0.726	1.33	0.31	5.78	0.706	0.40	0.08	1.93	0.252
Co-residence												
No (ref)	—	—	—		—	—	—		—	—	—	
Yes	0.46	0.08	2.77	0.397	0.35	0.09	1.44	0.146	0.29	0.06	1.54	0.148
Employed												
No (ref)	—	—	—		—	—	—		—	—	—	
Part-time	3.37	0.50	22.73	0.213	1.33	0.27	6.53	0.722	1.99	0.36	11.15	0.432
Full-time	1.38	0.17	11.39	0.768	2.31	0.40	13.22	0.348	0.71	0.10	4.85	0.728
Physical health	1.00	0.86	1.15	0.961	0.97	0.85	1.11	0.666	0.94	0.81	1.09	0.389
ADLs	1.06	0.86	1.32	0.574	0.811	0.66	0.99	<b>0.042</b>	1.34	1.08	1.68	<b>0.009</b>
Mental health	0.89	0.79	1.00	<b>0.046</b>	1.13	1.02	1.26	<b>0.020</b>	0.88	0.79	0.98	<b>0.020</b>
H-L test	$\chi^2(8) = 8.815, P = .358$				$\chi^2(8) = 3.817, P = .873$				$\chi^2(8) = 4.711, P = .788$			
Nagelkerke R <sup>2</sup>	24.5%				27.4%				45.7%			
Classification	79.7%				71.6%				76.5%			

Abbreviations: ADLs, activities of daily living; H-L test, Hosmer-Lemeshow test; OR<sub>adj</sub>, adjusted odds ratio; ref, reference; Sig, significance.  
<sup>a</sup>Bolded values indicate significance at the P < .05 level.

particularly among male HFCs; those providing a greater amount of daily, hands-on care; and caregivers with poorer mental health.

**Limitations**

This study is limited by the small sample size, nonrandom selection of participants, lack of a noncaregiver comparison population, and cross-sectional design. Although the

racial and ethnic representation in this sample was similar to the national hospice patient population in the United States,<sup>35</sup> the large proportions of non-Hispanic White and female participants is a limitation to generalizability. Relatedly, findings regarding male HFCs' self-care should be interpreted with caution because of the smaller representation of male caregivers in this sample. Hospice family caregivers may have also engaged in other forms of self-care or





have other caregiving assistance not examined in the current study. Hospice family caregivers may also have competing demands such as work or other considerations such as physical limitations that were not assessed in this study, and future research should examine these factors within larger samples of working caregivers for adequately powered analyses of work-related demands. Although we assessed self-reported caregiving duration, not all HFCs may have been caregiving at the onset of patients' illness, and we did not assess for the illness severity of patients. Furthermore, there was heterogeneity in types of cancer diagnoses, which further prevented us from including these contexts as covariates. Finally, future examination of the directionality of the associations identified in this study is required because of the cross-sectional design.

## CONCLUSIONS

Principles of hospice and palliative care acknowledge the importance of the family context and well-being for family caregivers and individuals at the end of life.<sup>36</sup> Understanding the impact of mental health and caregiving intensity on self-care behaviors can help hospice clinicians prompt further screening into the need for respite, social work evaluation, and other supportive hospice services. This study also suggests that male and more task-burdened caregivers may need to be assessed for their ability to care for their own health conditions, including respite during times of illness, taking personal medications, and keeping doctors' appointments—which has implications for potential areas of caregiver assessment. Future studies should also expand examination of self-care behaviors using a longitudinal design, explore moderating and mediating relationships between self-care and outcomes such as mental health and caregiving burden, and study potential interactions of sex, and race and ethnicity.

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