



Self-reported physical and mental health of older adults: The roles of caregiving and resources

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ABSTRACT

Objectives: This study examined factors associated with self-reported physical and mental health, focusing on caregiving status and the availability of social supports and financial resources.

Methods: Two bivariate analyses were performed to examine the sociodemographic characteristics as well as perceived health outcomes among caregiving and non-caregiving participants. Two-equation probit models were used to determine independent predictors of self-reported physical and mental health, using data from 1071 community-based adults (≥ 60 years). An additional bivariate analysis was conducted to investigate the characteristics of caregivers who reported better physical health.

Results: Approximately 17% ($n = 183$) of respondents reported being caregivers, and those in caregiving roles tended to be ethnic minorities, married, and have telephone communication with family or friends on a daily basis. Better physical and mental health outcomes were common for caregivers and non-caregivers who reported having more resources (e.g., higher income, better preparedness for future financial need, higher satisfaction with transportation and housing, and no limitation of usual daily activities). However, sociodemographic and social support factors were not significantly associated with physical and mental health among caregivers, unlike their non-caregiver counterparts. In the probit model, caregivers were more likely to be physically healthy compared to non-caregivers (Coefficient = 0.34; p -value = 0.031). Compared with healthy non-caregivers ($n = 631$), healthy caregivers ($n = 141$) tended to be ethnic minorities, married, and have telephone communication with family or friends on a daily basis.

Conclusions: Findings suggest that preparing resources and maintaining strong social support systems may foster health status among older family caregivers.

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1. Introduction

The U.S. healthcare system is historically characterized by insufficient formal supports and services to meet the needs of caregivers. In recent years, policy has changed to provide better support to caregivers by strengthening informal supports. For example, the Older Americans Act of 2000 created the National Family Caregiver Support Program (NFCSP) to provide services and funds to assist family and friends to care for their beloved at home [1], and the Caregivers and Veterans Omnibus Health Services Act of 2010

helped the Department of Veterans Affairs support caregivers of veterans of wars in the form of cash assistance and counseling [1].

“Informal caregiver” and “family caregiver” are terms used to refer to an unpaid family member, friend, or neighbor who provides care to an individual with physical care needs or coping with disease [2]. Consistent with care recipients’ preferences, the majority of care delivered in the community is provided informally by friends and family members [3], which has been associated with reduced societal costs of care [4]. As a testament of the impact of the informal caregiving network, an estimated 42.1 million family caregivers provided informal care to friends and family members in 2009. The economic value of their unpaid contribution was estimated at approximately \$450 billion [1]. In this rapidly aging society, older adults have provided and will continue to provide a substantial amount of this informal care [5], yet less is known about older caregivers than about younger caregivers.

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Informal caregiving often requires substantial social support, financial resources, and a commitment from care providers that can result in physical, emotional, mental, and financial strain [5]. The stress of informal caregiving can negatively impact the health of informal caregivers, even in light of the potentially mediating positive experiences [6]. For example, some caregivers experience an increase in depression and anxiety [3,4], sleep disturbances [5], reduction in community involvement [7], and absenteeism from work [8].

Caregiving-related health outcomes and quality of life are associated with the extent and types of resources caregivers possess and caregivers' ability to manage caregiver stress and strain [9]. Informal caregivers of lower socioeconomic status sometimes exhibit poorer health status [10], while experiencing caregiving stress has been linked with a lack of environmental resources such as inadequate transportation [3] and housing instability. Receiving social support may positively affect caregiver's health. Informal caregivers with better family communication and community interactions were more likely to report having better health outcomes [11].

Few studies have examined statewide samples of older caregivers and non-caregivers in terms of physical and mental health outcomes considering a range of sociodemographic and resource factors. Therefore, the purposes of this study were to: (1) examine different and common factors associated with physical and mental health among caregivers and non-caregivers in terms of sociodemographics, social support, and resources; (2) identify factors associated with self-reported physical and mental health; and (3) explore the characteristics of caregivers who reported better physical health.

2. Methods

2.1. Data source

Data for this study were from the 2008 Aging Texas Well (ATW) Indicators Survey. Following legislative authority (EO RP 42) by the Texas Commission on Aging and Health, the ATW survey was conducted to evaluate and measure successful aging activities in older, community-dwelling Texans. This survey used the Random Digit Dialing technique. All Texans aged 60 years and older who had land-line telephones had an equal chance to be included in the sample. Designed to approximate the racial/ethnic distribution of Texans aged 60 years and older, Hispanics were oversampled in addition to those selected randomly. The overall cooperation rate – the percentage of people interviewed out of those who were contacted – was 40.3% [12]. The Texas A&M University Institutional Review Board granted approval for this study.

2.2. Study sample

Data were collected from 1138 residents age 60 years and older and included sociodemographic characteristic, social support, and caregiving-related resource factors. Due to inadequate cell size, those who reported themselves as "other" race/ethnicity ($n = 48$) or did not have caregiving information ($n = 19$) were excluded. The final study sample included 1071 older Texas residents.

2.3. Measurement

2.3.1. Dependent variables

The current study explored two dependent variables: self-reported physical health and self-reported mental health. Respondents were asked, "Would you say that in general your physical/mental health is: excellent, very good, good, fair, or poor?"

Responses were subsequently recoded as poor or fair and good, very good, or excellent for the purpose of the study.

2.3.2. Correlates

2.3.2.1. Informal caregiving. Study respondents indicated whether they provided care for a family member, which was coded as a binary variable.

2.3.2.2. Sociodemographic characteristics. The respondents were asked about age (i.e., 60–69, 70–79, and 80 or older), race/ethnicity (i.e., non-Hispanic white, African American, and Hispanic), sex (i.e., male and female), marital status (i.e., divorced, widowed, separated, or never been married, and married), and education (i.e., less than high school or some high school, high school, and greater than high school).

2.3.2.3. Social support. Family communication and community interaction were used to assess levels of social support. Respondents were asked, "How often do you talk to your family members, friends, or neighbors over the telephone or face to face: daily, weekly, monthly, yearly, or never?" We dichotomized these variables into weekly or longer and daily. Respondents were also asked, "Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied with friends, family, neighbors, and others in your community?" dichotomizing it into less than very satisfied and very satisfied due to the distribution characteristics.

2.3.2.4. Caregiving-related resources. Respondents reported their income level using ranges (i.e., less than \$20,000, \$20,000–60,000, and greater than \$60,000). As a part of financial preparedness, we identified perceived financial preparedness (i.e., unprepared, somewhat prepared, and very prepared), perceived satisfaction with transportation (i.e., less than very satisfied and very satisfied), and perceived satisfaction with housing (i.e., less than very satisfied and very satisfied). Ability to perform daily activities was used to assess other aspects of caregiving-related resources. Respondents were also asked the question, "During the past 30 days, for about how many days did poor physical health keep you from your usual daily activities, work, or recreation?" Due to the characteristics of this variable, we dichotomized it into binary (i.e., none or ≥ 1 days).

2.4. Analysis strategy

Analyses were conducted with Stata 11 statistical software [13]. To assess the potential relationship between study variables, we performed two bivariate analyses and a multivariate (i.e., bivariate probit) regression. First, a bivariate analysis was conducted to examine the associations of sociodemographics, social support, and caregiving-related resources with informal caregiving. The second bivariate analysis was performed to investigate the associations of sociodemographic, social support, and resource factors with physical and mental health among caregivers and non-caregivers. Bonferroni corrections were used to adjust the significance level to 0.025 (i.e., $0.05/2$) by making two comparisons (i.e., caregivers relative to non-caregivers; self-reported physical health relative to self-reported mental health) [14]. Then, two-equation probit (*biprobit*) models were conducted to determine independent predictors of (1) self-reported physical health and (2) self-reported mental health, using robust estimation. The *biprobit* model fits the maximum-likelihood two equation probit models, making it possible for the models to accommodate the structure of correlated errors that may occur if there are unobservable or unmeasured factors between two dependent variables [15]. The underlying algorithm for bivariate probit estimation (95% confidence interval) is maximum likelihood estimation [15], and a Wald test was used to

Table 1Descriptive and bivariate results: the relationships among demographic and social support, resources, and informal caregiving ($n = 1071$).^a

Variables	Non-caregivers ($n = 888$) % (n)	Caregivers ($n = 183$) % (n)	Total ($n = 1071$) % (n)
Demographic factors			
Age			
60–69	44.7 (393)	53.6 (97)	46.2 (490)
70–79	35.8 (315)	32.0 (58)	35.2 (373)
≥80	19.5 (171)	14.4 (26)	18.6 (197)
Race/ethnicity**			
Non-Hispanic white	71.8 (629)	60.2 (109)	69.8 (738)
African American	7.31 (64)	14.4 (26)	8.5 (90)
Hispanic	20.9 (183)	25.4 (46)	21.7 (229)
Sex			
Male	29.9 (266)	31.7 (58)	30.3 (324)
Female	70.1 (622)	68.3 (125)	69.8 (747)
Marital status*			
Not married ^b	50.4 (445)	40.4 (74)	48.7 (519)
Married	49.6 (438)	59.6 (109)	51.3 (547)
Education			
<High school	19.7 (169)	16.7 (28)	18.6 (197)
High school	35.0 (301)	37.5 (63)	34.3 (364)
>High school	45.3 (389)	45.8 (77)	47.1 (500)
Social support			
Family communication (on the phone)**			
≥Weekly	26.8 (237)	17.0 (31)	25.1 (268)
Daily	73.2 (647)	82.9 (151)	74.9 (798)
Satisfaction with the community interaction			
<Very satisfied	33.3 (293)	32.8 (60)	33.2 (353)
Very satisfied	66.7 (588)	67.2 (123)	66.8 (711)
Resources			
Income			
<\$20,000	39.1 (259)	37.7 (55)	38.8 (314)
\$20,000–60,000	39.5 (262)	45.9 (67)	40.7 (329)
>\$60,000	21.4 (142)	16.4 (24)	20.5 (166)
Future financial need			
Unprepared	19.0 (166)	26.4 (48)	20.3 (214)
Somewhat prepared	44.6 (389)	40.1 (73)	43.8 (462)
Very prepared	36.4 (317)	33.5 (61)	35.9 (378)
Satisfaction with transportation			
<Very satisfied	32.9 (288)	29.7 (54)	32.4 (342)
Very satisfied	67.1 (586)	70.3 (128)	67.6 (714)
Satisfaction with housing			
<Very satisfied	26.5 (234)	24.9 (45)	26.2 (279)
Very satisfied	73.5 (650)	75.1 (136)	73.8 (786)
Limitation of usual daily activities			
None	68.9 (591)	68.4 (121)	68.8 (712)
Yes	31.1 (267)	31.6 (56)	31.2 (323)

^a Fisher's exact Chi²-test.^b Not married included divorced, widowed, separated, or never been married.* $p < 0.05$.** $p < 0.01$.

evaluate goodness-of-fit in the final model. An additional bivariate analysis was performed to investigate the characteristics of study participants in terms of caregiving activities and physical health status (i.e., healthy caregivers, unhealthy caregivers, healthy non-caregivers, and unhealthy non-caregivers) using Fisher's exact test.

3. Results

Of the 1071 participants in the survey, approximately 17% ($n = 183$) reported they provided informal care (Table 1). Providing informal care (compared to not providing care) was more common among African American (14.4% compared to 7.3%) and Hispanic respondents (25.4% compared to 20.9%) than among non-Hispanic white counterparts (60.2% compared to 71.8%). Higher proportions of caregivers were married (59.6% compared to 49.6%) and had telephone communication with family or friends on a daily basis (82.9% compared to 73.2%).

Table 2 shows the associations between covariates and physical and mental health among non-caregivers and caregivers.

Non-caregivers tended to report better physical and mental health if they were non-Hispanic white, married, and had education higher than high school. They also tended to report better physical and mental health when they were very satisfied with their level of community interaction, their transportation, and housing; had higher income, perceived themselves as very prepared for future financial need, and did not report having limitation of usual daily activities. Caregivers, on the other hand, tended to report better physical health when they reported being very prepared with future financial need, very satisfied with transportation, very satisfied with housing, and did not report limitation of usual daily activities. Each of these estimated relationships were significant at the 0.01. Caregivers also tended to report better mental health when they had higher income, reported being very satisfied with housing, and did not report limitation of usual daily activities, all at the significance level of 0.05.

Table 3 shows factors associated with physical and mental health status, after controlling for informal caregiving, sociodemographic, social support, and resource factors. The first set of columns displays the estimated probabilities of older adults being physically healthy (i.e., "excellent/very good/good" compared to "poor/fair"). Providing informal care was significantly related to an increased probability of being physically healthy (Coefficient = 0.336; p for trend 0.031). Similarly, older adults were likely to be more physically healthy if they were more educated (i.e., high school graduate and >high school) compared to less educated (i.e., <high school) (Coefficient = 0.548; p for trend <0.001 and Coefficient = 0.731; p for trend <0.001, respectively). Higher income (i.e., \$20,000–60,000 and \$60,000+ compared to <\$20,000) (Coefficient = 0.307; p for trend 0.028 and Coefficient = 0.498; p for trend 0.011, respectively), being very prepared for future financial need (Coefficient = 0.378; p for trend 0.027), and being very satisfied with transportation (Coefficient = 0.675; p for trend <0.001) were significantly associated with having better physical health. Those who reported any days of being unable to perform their usual daily activities in the last month were less likely to report better physical health (Coefficient = -0.944; p for trend <0.001).

The second set of columns in Table 3 shows the estimated probabilities of older adults being mentally healthy (i.e., "excellent/very good/good compared" to "poor/fair"). Informal caregiving was not associated with self-reported mental health. African Americans were less likely to report having better mental health than their non-Hispanic white counterparts (Coefficient = -0.531; p for trend 0.037). Female respondents reported better mental health than male respondents (Coefficient = 0.498; p for trend 0.005) and more educated respondents (i.e., high school graduate and >high school) reported better mental health than respondents with less than a high school education (Coefficient = 0.774; p for trend <0.001 and Coefficient = 0.661; p for trend 0.002, respectively). Being very satisfied with one's community interaction increased the likelihood of being mentally healthy (Coefficient = 0.359; p for trend 0.034). Those who reported having a higher income (i.e., \$20,000–60,000; >\$60,000) also reported better mental health than lower-income respondents (Coefficient = 0.988; p for trend 0.004). Being very prepared with future financial need was also associated with better mental health (Coefficient = 0.535; p for trend 0.024). Having any days of being unable to perform their usual daily activities decreased the probability of having better mental health (Coefficient = -1.106; p for trend 0.001). The Wald test of independent equations ($\rho = 0$) between physical and mental health had $\chi^2_{df} = 20.73(1)$ (p for trend <0.0001), implying that the two equations are strongly correlated.

Table 4 shows the characteristics of study participants in terms of caregiving activities and physical health status (i.e., healthy caregivers, unhealthy caregivers, healthy non-caregivers, and unhealthy non-caregivers). Compared with healthy

Table 2Descriptive and bivariate results: the relationships among demographic and social support, resources, and being physically or mentally healthy in terms of caregiving activities ($n = 1071$).

	Non-caregivers								Caregivers							
	Self-reported physical health				Self-reported mental health				Self-reported physical health				Self-reported mental health			
	Poor/fair	Good/very good/excellent	Total	$Pr < \chi^2$	Poor/fair	Good/very good/excellent	Total	$Pr < \chi^2$	Poor/fair	Good/very good/excellent	Total	$Pr < \chi^{2a}$	Poor/fair	Good/very good/excellent	Total	$Pr < \chi^{2a}$
Demographic factors																
Age																
60–69	49.8	42.8	44.8	0.570	53.1	43.8	44.7	0.195	54.8	53.2	53.6	1.000	57.1	53.3	53.6	1.000
70–79	29.9	38.3	35.9		27.2	36.7	35.8		31.0	32.4	32.0		28.6	32.3	32.0	
≥80	20.3	18.9	19.3		19.8	19.5	19.5		14.3	14.4	14.4		14.3	14.4	14.4	
Race/ethnicity																
Non-Hispanic white	50.4	80.4	71.8	<0.001	39.8	75.4	72.0	<0.001	58.5	60.7	60.2	0.967	42.9	61.7	60.2	0.297
African American	10.8	5.8	7.2		13.3	6.6	7.2		14.6	14.3	14.4		14.3	14.4	14.4	
Hispanic	38.8	13.8	21.0		47.0	18.1	20.8		26.8	25.0	25.4		42.9	24.0	25.4	
Sex																
Male	26.4	31.4	29.9	0.142	28.6	29.9	29.8	0.796	35.7	30.5	31.7	0.572	35.7	31.4	31.7	0.769
Female	73.6	68.6	70.1		71.4	70.1	70.2		64.3	69.5	68.3		64.3	68.6	68.3	
Marital status																
Not married ^b	60.1	46.4	50.3	<0.001	67.5	48.6	50.4	0.001	45.2	39.0	40.4	0.479	50.0	39.6	40.4	0.573
Married	39.9	53.6	49.7		32.5	51.4	49.6		54.8	61.0	59.6		50.0	60.4	59.6	
Education																
<High school	41.6	10.2	19.2	<0.001	60.5	14.9	19.1	<0.001	23.8	13.0	15.5	0.253	28.6	14.4	15.5	0.327
High school	31.6	35.3	34.2		19.8	35.6	34.2		33.3	35.3	34.8		35.7	34.7	34.8	
>High school	26.8	54.6	46.6		19.8	49.4	46.7		42.9	51.8	49.7		35.7	50.9	49.7	
Social support																
Family communication (on the phone)																
≥Weekly	29.6	25.6	26.8	0.224	35.7	25.8	26.8	0.051	17.1	17.0	17.0	1.000	35.7	15.5	17.0	0.067
Daily	70.4	74.4	73.2		64.3	74.2	73.2		82.9	83.0	83.0		64.3	84.5	83.0	
Satisfaction with the community interaction																
<Very satisfied	43.4	29.1	33.1	<0.001	47.6	31.7	33.2	0.004	38.1	31.2	32.8	0.455	57.1	30.8	32.8	0.071
Very satisfied	56.6	70.9	66.9		52.4	68.3	66.8		61.9	68.8	67.2		42.9	69.2	67.2	
Resources																
Income																
<\$20,000	63.1	28.5	39.1	<0.001	82.5	34.4	39.0	<0.001	52.9	33.0	37.7	0.099	71.4	34.1	37.7	0.011
\$20,000–\$60,000	27.6	44.9	39.6		15.9	42.1	39.6		38.2	48.2	45.9		14.3	49.2	45.9	
>\$60,000	9.4	26.6	21.3		1.6	23.5	21.5		8.8	18.8	16.4		14.3	16.7	16.4	
Future financial need																
Unprepared	38.7	11.3	19.1	<0.001	51.2	15.7	19.1	<0.001	42.9	21.4	26.4	0.006	50.0	24.4	26.4	0.097
Somewhat prepared	44.8	44.5	44.6		34.2	45.6	44.6		40.5	40.0	40.1		35.7	40.5	40.1	
Very prepared	16.5	44.2	36.3		14.6	38.7	36.4		16.7	38.6	33.5		14.3	35.1	33.5	
Satisfaction with transportation																
<Very satisfied	61.5	21.6	32.9	<0.001	68.4	29.4	32.9	<0.001	57.1	21.4	29.7	0.000	42.9	28.6	29.7	0.360
Very satisfied	38.5	78.4	67.1		31.7	70.6	67.1		42.9	78.6	70.3		57.1	71.4	70.3	
Satisfaction with housing																
<Very satisfied	41.9	20.1	26.3	<0.001	51.2	23.7	26.3	<0.001	41.5	20.0	24.9	0.007	53.9	22.6	24.9	0.019
Very satisfied	58.1	79.9	73.7		48.8	76.3	73.7		58.5	80.0	75.1		46.2	77.4	75.1	
Limitation of usual daily activities																
None	40.4	79.6	68.8	<0.001	37.3	72.0	68.9	<0.001	40.5	75.7	68.4	0.000	16.7	72.1	68.4	<0.001
Yes	59.6	20.5	31.2		62.7	28.0	31.1		59.5	24.3	31.6		83.3	27.9	31.6	

^a Fisher's exact χ^2 -test.^b Not married included divorced, widowed, separated, or never been married; bold numbers are statistically significant when using more demanding significance level (0.025 rather than 0.05) because we made two comparisons.

Table 3

Estimated probability of being physically or mentally healthy, bivariate probit specification ($n = 746$).

Variables	Self-reported physical health	Self-reported mental health
Informal caregiving		
Yes (vs. no)	0.336* (0.156)	0.034 (0.207)
Demographic factors		
Age (vs. 60–69)		
70–79	0.253 (0.131)	0.059 (0.18)
≥80	0.102 (0.174)	0.082 (0.248)
Race/ethnicity (vs. non-Hispanic white)		
African American	−0.095 (0.202)	−0.531* (0.254)
Hispanic	−0.121 (0.143)	−0.213 (0.190)
Sex (vs. male)		
Female	0.217 (0.131)	0.498** (0.177)
Marital status (vs. not married ^a)		
Married	−0.059 (0.125)	−0.007 (0.167)
Education (vs. <high school)		
High school	0.548** (0.156)	0.774** (0.200)
>High school	0.731** (0.172)	0.661** (0.209)
Social support		
Family communication (on the phone) (vs. ≥weekly)		
Daily	0.028 (0.137)	0.271 (0.180)
Satisfaction with the community interaction (vs. <very satisfied)		
Very satisfied	0.018 (0.129)	0.359* (0.169)
Resources		
Income (vs. <\$20,000)		
\$20,000–60,000	0.307* (0.139)	0.393* (0.189)
>\$60,000	0.496* (0.195)	0.988** (0.344)
Future financial need (vs. unprepared)		
Somewhat prepared	0.131 (0.139)	0.344 (0.187)
Very prepared	0.378* (0.171)	0.535* (0.237)
Satisfaction with transportation (vs. <very satisfied)		
Very satisfied	0.675** (0.125)	0.118 (0.163)
Satisfaction with housing (vs. <very satisfied)		
Very satisfied	−0.019 (0.138)	0.117 (0.179)
Limitation of usual daily activities (vs. none)		
Yes	−0.944** (0.115)	−1.106** (0.175)
Constant	−0.587 (0.257)	0.203 (0.343)

^a Not married included divorced, widowed, separated, or never been married; Wald test of $\rho = 0$; $\chi^2(1) = 20.74$; $p < 0.0001$; Numbers in parentheses represent robust standard errors.

* $p < 0.05$.

** $p < 0.01$.

non-caregivers ($n = 631$), healthy caregivers ($n = 141$) tended to be ethnic minorities (p for trend < 0.01), be married (p for trend < 0.01), and have telephone communication with family or friends on a daily basis (p for trend < 0.05).

4. Discussion

Approximately 17% of older Texans reported providing informal care. Those in caregiving roles tended to be ethnic minorities (i.e., African Americans, Hispanics), married, and have frequent

telephone communication with family or friends. The caregiving rate found in our study appears comparable to other studies including similar age-related characteristics [16,17]. For example, in a recent national study, about 14% ($n = 1461$) of the study participants were caregiving adults aged 65 or older [16]. Better physical and mental health were common among both caregivers and non-caregivers who reported more resources (e.g., higher income), while demographic and social support factors were not significantly associated with physical and mental health among caregivers unlike their non-caregiving counterparts. The current study indicates that caregivers were more likely to report better physical health compared to non-caregivers after controlling for informal caregiving status, sociodemographics, social support, and resources. Caregivers who reported better physical health were significantly or marginally likely to have more frequent family communication and be very satisfied with their level of community interaction compared to their counterparts (i.e., unhealthy caregivers, healthy non-caregivers, and unhealthy non-caregivers).

Although a prior study found older caregivers usually experience poorer perceived health [18], one interesting finding of this study is the positive association between informal caregiving and self-reported physical health. A recent meta-analysis found that perceived physical health among caregivers remained stable over time and informal caregiving does not necessarily reduce physical health [6]. Our further investigation found that caregivers with better physical health were married and communicated daily with family on the telephone relative to non-caregivers with better physical health. These healthy caregivers tended to report better mental health compared to unhealthy caregivers and unhealthy non-caregivers. When it comes to the potentially positive health aspects of providing informal care among older adults, we postulate that familial support system associated with care provision (marriage, close contact with family members) is potentially positive aspect of being a caregiver, and may be associated with decreased mental health issues (and thus increased physical health). Given that negative effects of caregiving on physical health are mostly found among psychologically distressed, older caregivers [10], we recognize the importance of offering caregivers either physical or mental health services and supports as the relationship between somatic and psychological health implies that better health in one domain is associated with better health in the other domain.

The relationship among race/ethnicity, perceived health, and informal caregiving is also worth explicating further. A larger proportion of African American and Hispanic participants reported being caregivers compared to non-Hispanic whites. This finding is consistent with previous literature showing caregiving as more prevalent among ethnic minorities [19]. A cross-sectional study found that African-Americans were 30% more likely to be caregivers; and were more likely to assist friends than their white counterparts [17]. Cultural influences and the availability of caregiving-related resources may explain these racial/ethnic differences in informal caregiving. Culturally, non-Hispanic whites value individualism and self-reliance, and as such tend to use only immediate family members (e.g., spouses) in their caregiving networks. Other racial/ethnic groups are more likely to have a varied group of extended helpers (e.g., friends, church members) based on values about reciprocity, familial obligations, and a sense of responsibility for providing informal care [20]. Types of coping may be particularly appealing or useful among cultural subgroups of caregivers. Black/African American and Hispanic/Latino caregivers are more likely than non-Hispanic white caregivers to engage in religious-based coping, which has been shown to decrease depressive symptoms and reduce the need for depression intervention [21]. Non-Hispanic whites may have more caregiving-related resources at their disposal, such as higher monetary resources for

Table 4Descriptive and bivariate results: the characteristics of caregivers who are physically healthy compared to their counterparts ($n = 1068$).^a

Variables	Caregivers physically healthy ($n = 141$) % (n)	Caregivers physically unhealthy ($n = 42$) % (n)	Non-caregivers physically healthy ($n = 631$) % (n)	Non-caregivers physically unhealthy ($n = 254$) % (n)	Total ($n = 1068$) % (n)
Mental health**					
Poor/fair	2.1 (3)	26.2 (11)	1.9 (12)	28.6 (72)	9.2 (98)
Good/very good/excellent	97.9 (138)	73.8 (31)	98.1 (619)	71.4 (180)	90.8 (968)
Demographic factors					
Age					
60–69	53.2 (74)	54.8 (23)	42.8 (268)	49.8 (125)	46.3 (490)
70–79	32.4 (45)	30.9 (13)	38.3 (240)	29.9 (75)	35.3 (373)
≥80	14.4 (20)	6 (14.3)	18.9 (118)	20.3 (51)	18.4 (195)
Race/ethnicity**					
Non-Hispanic white	60.7 (85)	58.5 (24)	80.4 (501)	50.4 (126)	69.8 (736)
African American	14.3 (20)	14.6 (6)	5.8 (36)	10.8 (27)	8.4 (89)
Hispanic	25.0 (35)	26.8 (11)	13.8 (86)	38.8 (97)	21.7 (229)
Sex					
Male	30.5 (43)	33.7 (15)	31.4 (198)	26.4 (67)	30.2 (323)
Female	59.5 (98)	64.3 (27)	68.6 (433)	73.6 (187)	69.8 (745)
Marital status**					
Not married ^b	39.0 (55)	45.2 (19)	46.4 (291)	60.1 (152)	48.6 (517)
Married	61.0 (86)	54.8 (23)	53.6 (336)	39.9 (101)	51.4 (546)
Education**					
<High school	12.9 (18)	23.8 (10)	10.2 (64)	41.6 (104)	18.5 (196)
High school	35.3 (49)	33.3 (14)	35.3 (221)	31.6 (79)	34.3 (363)
>High school	51.8 (72)	42.9 (18)	54.6 (342)	26.8 (67)	47.2 (499)
Social support					
Family communication (on the phone) [*]					
≥Weekly	17.0 (24)	17.1 (7)	25.6 (161)	29.6 (75)	25.1 (267)
Daily	83.0 (117)	82.9 (34)	74.4 (467)	70.4 (178)	74.9 (796)
Satisfaction with the community interaction**					
<Very satisfied	31.2 (44)	38.1 (16)	29.1 (183)	43.4 (108)	33.1 (351)
Very satisfied	68.8 (97)	61.9 (26)	70.9 (446)	56.6 (141)	66.9 (710)
Resources					
Income**					
<\$20,000	33.0 (37)	52.9 (18)	28.5 (131)	63.1 (128)	38.9 (314)
\$20,000–60,000	48.2 (54)	38.2 (13)	44.9 (206)	27.6 (56)	40.7 (329)
>\$60,000	18.8 (21)	8.8 (3)	26.6 (122)	9.4 (19)	20.4 (165)
Future financial need**					
Unprepared	21.4 (30)	42.9 (18)	11.3 (70)	38.7 (96)	20.3 (214)
Somewhat prepared	40.0 (56)	40.5 (17)	44.5 (277)	44.8 (111)	43.8 (461)
Very prepared	38.6 (54)	16.7 (7)	44.2 (275)	16.5 (41)	35.8 (377)
Satisfaction with transportation**					
<Very satisfied	21.4 (30)	57.1 (24)	21.6 (135)	61.5 (152)	32.4 (341)
Very satisfied	78.6 (110)	42.9 (18)	78.4 (490)	38.5 (95)	67.6 (713)
Satisfaction with housing**					
<Very satisfied	20.0 (28)	41.5 (17)	20.1 (126)	41.9 (106)	26.1 (277)
Very satisfied	80.0 (112)	58.5 (24)	79.9 (502)	58.1 (147)	73.9 (785)
Limitation of usual daily activities**					
None	75.7 (106)	40.5 (15)	79.6 (494)	40.4 (95)	68.7 (710)
Yes	24.3 (34)	59.5 (22)	20.5 (127)	59.6 (140)	31.3 (323)

^a Fisher's exact Chi²-test.^b Not married included divorced, widowed, separated, or never been married.^{*} $p < 0.05$.^{**} $p < 0.01$.

the purchase of assistance (e.g., privately paid help) rather than relying on family members or friends [22].

Social support factors were also associated with better health outcomes, which is in line with the previous literature [23]. Those who were very satisfied with the community interaction were likely to report better mental health. Our bivariate analysis indicated that healthy caregivers tended to be married and have telephone communication with family or friends on a daily basis compared to healthy non-caregivers. A prior study also suggested positive impacts of family communication on health behaviors and outcomes [24]. More frequent communication with family or friends may lead to tighter bonds, which can alter social structures to meet members' needs by mobilizing adequate information and support in later in life [25]. Nevertheless, the multiple regression analyses found no social support factors were significantly associated with physical and mental health among caregivers. Future studies should further examine how informal caregiving could moderate the relationships between social support and health outcomes.

The current study found that having more resources was indicative of better physical and mental health among study participants, which is consistent with the previous research [26]. It is not surprising that having higher income and being better prepared for future financial need were positively associated with reporting better physical and mental health, while having limitation of usual daily activities was negatively associated with physical and mental health. In later life, lower financial status can represent barriers to healthy eating and access to physical resources. A low socioeconomic status (SES) can prevent older adults from purchasing healthy, relatively expensive foods and increase their chance of eating calorically dense fast food [27]. However, transportation and housing, which are closely associated with financial status and represent essential resources in later lives, were differently related to health status. Higher satisfaction with transportation was associated with better physical health, while satisfaction with housing was not associated with mental or physical health status. Despite the elusive links between satisfaction with transportation and health among older adults, being satisfied with transportation can be translated into better access to desired people and places, psychological benefits of movement, exercise benefits, and involvement in the local community [28]. The non-significant relationship between satisfaction with housing and health in the current study is not consistent with previous literature [29] and requires further research. Moreover, multiple regression analysis in samples containing a larger proportion of older caregivers should investigate how these factors were predictive of caregiving activities among older adults.

This study has limitations. While this is one of the largest studies of caregiving conducted in Texas, the cross-sectional survey methodology used for the Aging Texas Well survey does not allow for examination of change over time among individual respondents. Thus, while we can identify characteristics associated with caregiving, we cannot draw conclusions about causality. There may be a selection bias in the current cross-sectional study where caregivers who are physically healthy are more likely to provide informal care. Moreover, despite our better-than-typical response rate in a community survey [30], caution is needed in generalizing the current study findings based on the 40.3% of the overall cooperation rate and the random digit dialing technique, which has been criticized because of its possible bias [31]. Next, this study does not fully address the way in which caregivers and care recipients are formally related (or not related). The type and quality of the relationship between caregivers and care recipients before care needs arise may impact whether or not one chooses to be an informal caregiver. The size of the caregiving network is also not addressed in this study. Often, a primary informal caregiver

works with other family and friends to make decisions and/or provide actual care. These additional caregivers have the potential to positively or negatively impact caregiver health, but were not captured in the Aging Texas Well survey. Moreover, all variables in this study were self-reported, which limits conclusions to the realm of caregiver perspective, an important but incomplete indicator of caregiver health. Lastly, the current study also lacked information about participants' employment status, which may affect caregiving activities, especially among younger cohorts within the older populations.

Despite these limitations, findings of the current study may help to identify caregiver's needs and policy actions to support older caregivers. The large database allowed us to describe characteristics associated with informal caregiving, and to explore the role of factors not usually examined in caregiving studies (e.g., the role of resources preparedness that can enable an older caregiver to continue in this role). Given caregiving has an important implications for physical and mental health, policy programs for supporting older caregivers should focus on their utilization of community networks and existing services to aid in their mental health. Ideally, older caregivers should be advised prior to the onset of caregiving responsibilities regarding financial and resource planning. These concerted efforts may improve health outcomes for caregivers, enable caregivers to maintain their roles longer, and delay nursing home admissions for care recipients.

Contributors

SA: analysis and interpretation of data, and writing of the manuscript; AH: interpretation of the data and writing of the manuscript; DM: interpretation of the data and writing of the manuscript; MS: organizing the study and editing the paper; MO: initiating, organizing the study, and editing the paper.

Competing interests

The authors declare that they have no conflicts of interests with respect to their authorship or the publication of this article.

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