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Health Behaviors Among Baby Boomer Informal Caregivers

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Purpose of the Study: This study examines health-risk behaviors among "Baby Boomer" caregivers and non-caregivers. **Design and Methods:** Data from the 2009 California Health Interview Survey of the state's non-institutionalized population provided individual-level, caregiving, and health behavior characteristics for 5,688 informal caregivers and 12,941 non-caregivers. Logistic regression models were estimated separately for four individual health-risk behaviors—smoking, sedentary behavior, and regular soda and fast-food consumption—as well as a global health-risk measure. **Results:** Controlling for psychological distress and personal characteristics and social resources such as age, gender, income and education, work and marital status, and neighborhood safety, caregivers had greater odds than non-caregivers of overall negative health behavior and of smoking and regular soda and fast-food consumption. We did not observe significant differences in odds of negative behavior related to stress for spousal caregivers and caregivers in the role for longer periods of time or those providing more hours of weekly care compared with other caregivers. **Implications:** Our study found evidence that Baby Boomer caregivers engage in poor health behaviors that are associated with exposure to caregiving. Baby Boomer caregivers may be at risk for certain behavioral factors that are associated with disability and chronic illness.

Key Words: Caregiving—Informal, Behavior, Caregiver stress, Stress and coping, Nutrition, Exercise

Baby Boomers, persons born between the years of 1946 and 1964, are exhibiting worrying health trends. Although age-specific mortality rates and the proportion of Baby Boomers reporting poor or fair health declined substantially from 1982 to 1997, recent findings indicate significantly worse outcomes in chronic conditions such as obesity, diabetes, and cardiovascular disease (Martin, Freedman, Schoeni, & Andreski, 2009). Baby Boomers exhibit higher obesity rates and have been obese for longer periods of their lives compared with earlier generations (Leveille, Wee, & Iezzoni, 2005). Moreover, Baby Boomers have high rates of metabolic syndrome (Ford, Giles, &

Dietz, 2002), which increases the risk for diabetes and for cardiovascular disease and mortality for middle-aged men (Lakka et al., 2002).

Behavioral risk factors may have something to do with these increasingly poor health outcomes. For instance, physical inactivity and being overweight, among other behaviors or characteristics, contribute to chronic illness (Manson, Skerrett, Greenland, & VanItallie, 2004). Additionally, a World Bank study found that certain behavioral risk factors contributed significantly to years of lost life among 40- to 59-year-olds in high-income countries—5% of lost years of life was attributable to low fruit and vegetable intake, 5% to physical inactivity, and 31% to smoking among men (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006).

Although behavioral factors such as avoiding smoking, managing weight, and engaging in physical activity are essential to avoiding disability, many U.S. Baby Boomers are not engaging in healthy behaviors. Approximately 22% of 45- to 64-year-old adults are smokers (Centers for Disease Control and Prevention, 2009), and adults aged 55–64 years exhibit eating habits associated with poor nutritional quality (Davis, Murphy, Neuhaus, Gee, & Quiroga, 2000). Epidemiological research also indicates rising soda portion sizes, ranging from 12 to 20 fluid ounces (oz), among Americans (Nielsen & Popkin, 2003). The *2008 Physical Activity Guidelines for Americans* indicate that "medium activity" (150–300 min of moderate-intensity activity or 75–150 min of vigorous-intensity physical activity per week) conveys substantial health benefits, but many Americans have low levels of physical activity (Department of Health and Human Services, 2008).

Informal caregiving might be an additional cause for concern for Baby Boomers. The burden of caregiving is significant and well documented, and over 10 million adults over the age of 50—primarily Baby Boomers—care for an aging parent (MetLife, 2011). An estimated 3.3 million U.S. adults provided unpaid, informal care for a spouse in the past 12 months, and the percentage of 50- to 64-year-olds providing informal care is growing (National Family Caregivers Association, 2011). However, there is limited research to date regarding the combination of smoking, physical activity, and diet among caregivers—including Baby Boomer caregivers. Some studies have shown that caregivers engage in fewer health-promoting self-care behaviors (Acton, 2002), including their amount of exercise (Janevic & Connell, 2004). Compared with non-caregivers,

certain adults caring for family members from multiple generations are less likely to exercise regularly but smoke marginally more cigarettes (Chassin, Macy, Seo, Presson, & Sherman, 2009).

However, other earlier studies had insignificant findings. One study observed that caregivers did not significantly reduce their use of preventive services and did not report a higher number of missed meals, missed doctor appointments, missed flu shots, or higher levels of smoking (Burton, Newsom, Schulz, Hirsch, & German, 1997). Another study found that caregivers did not significantly differ from non-caregivers on 10 of 13 health practices or on the total number of positive health behaviors (Scharlach, Midanik, Runkle, & Soghikian, 1997).

To further explore health behaviors of Baby Boomer caregivers, the present study used a representative statewide survey and adapted a theoretical stress model (Vitaliano et al., 2002) to examine smoking, sedentary behavior, and eating habits among Baby Boomer caregivers. The proposed model posits several pathways that might separately or jointly influence health behaviors, the first of which is exposure to stress. Stress may lead people to seek out pleasurable stimuli (Zillman & Bryant, 1985) and raises hormone levels that over time may alter health behaviors (Vitaliano, Zhang, & Scanlan, 2003). Stress exposure among younger adults, for instance, has been associated with higher consumption of sweets, including soda (Elfhag, Tholin, & Rasmussen, 2008), and high-fat and high-caloric food (Zellner et al., 2006). Stress has also been associated with lower levels of physical activity and increased rates of smoking among working adults (Ng & Jeffery, 2003).

Psychological distress resulting from exposure to caregiving is the second potential pathway to poor health behavior. Distress is negative affect or depressed mood, hassles, burden, and absence of positive experiences in response to chronic stress (Vitaliano et al., 2002). Researchers have observed associations between psychological distress and eating, including sugar and soda consumption (Shi, Taylor, Wittert, Goldney, & Gill, 2010), as well as smoking (Pratt, Dey, & Cohen, 2007). One study found that adults with high stress levels have higher depression levels and lower participation in sports activities (Wijndaelea et al., 2007).

Personal or social resources may also affect distress and health behaviors. Women are more likely to engage in stress-induced eating (Greeno & Wing,

1994), and income is negatively associated with depression levels (Schulz, Tompkins, & Rau, 1988) as well as health behaviors such as smoking, physical activity, and diet; additionally, education and occupation may influence health behavior (Laaksonen, Prattala, Helasoja, Uutela, & Lahelma, 2003). Married persons have better psychological well-being compared with those who are single (Shapiro & Keyes, 2008). Although employment may function as a type of personal resource, it may also create "negative spillover" from the workplace to the household, causing psychological distress (Riley & Bowen, 2005). Additionally, individuals living in less socially cohesive neighborhoods are more likely to smoke and less likely to exercise (Clark et al., 2008).

Caregiving itself involves chronic stress and psychological distress (Schulz & Sherwood, 2008), and different types or amounts of caregiving may involve varying levels of stress exposure. For instance, spousal caregivers provide the most all-inclusive care (Pinquart & Sorensen, 2003b) and are at risk for psychological distress (Pruchno & Potashnik, 1989) and less nutritious eating (Connell, 1994). Moreover, the number of stressors experienced by spousal caregivers explained roughly one quarter of their depression and one half of their stress levels (Vedhara, Shanks, Anderson, & Lightman, 2000). Although there is some evidence that burden and distress levels do not differ among caregivers caring for biologically related family members compared with in-laws (Pinquart & Sorenson, 2011), caregiver strain is associated with the caregiver living situation (Deimling, Bass, Townsend, & Noelker, 1989). At the same time, the amount or level of caregiving provided are negatively associated with exercise (Sisk, 2000) and health-risk behaviors (Burton, Zdaniuk, Schulz, Jackson, & Hirsch, 2003).

In this study, we were interested in testing for associations between caregivers' exposure to stress and negative health behaviors, controlling for psychological distress, and personal and social resources. The negative health behaviors we examined were smoking, sedentary behavior, regular soda and fast-food consumption, as well as global, negative health behavior. For the present study, we developed three separate hypotheses to test, based on Vitaliano's stress model:

- Controlling for other factors, caregivers will be more likely than non-caregivers to engage in negative health behavior (H1);

- Controlling for other factors, spousal caregivers will be more likely than other caregivers to engage in negative health behavior (H2); and
- Controlling for other factors, more weekly caregiver hours and a greater total duration of caregiving time will each be associated with negative health behavior (H3).

Design and Methods

Study Data

Study data are from the 2009 California Health Interview Survey (CHIS), the largest statewide, population-based survey in the nation. The survey employs a multistage sampling design, using a random-digit-dial sample of landline and cellular (stratified by area code) telephone numbers from 44 geographic sampling strata to randomly select households. Within each household, an adult respondent (aged 18 and older) was randomly selected. Surveys were conducted in English, Spanish, Chinese (Mandarin and Cantonese), Vietnamese, and Korean.

Study Sample

In 2009, CHIS surveyed 47,614 adults and 12,324 teens and children in more than 49,000 households, with oversampling of Los Angeles and San Diego Counties. The sample is representative of California's non-institutionalized population, with certain racial and ethnic subgroups sampled at higher rates than other groups. The survey includes respondent information from 18,629 adults of the Baby Boomer generation, individuals born between 1946 and 1964. The ages of these adults in 2009 ranged from 45 to 63 years. Two analytic samples were used to assess the association of caregiving with health behaviors. The first sample had 18,629 Baby Boomers and was used to test H1, whereas the second sample involved 5,688 Baby Boomer caregivers and was used to test H2 and H3.

Measures

Caregiving.—We used a number of caregiving variables in the present study. One measure was caregiver status (1 = yes, 0 = no). Survey respondents were asked, "During the past 12 months, did you provide any such help to a family member or friend?" If necessary, respondents were told: "This may include help with baths, medicines, household chores, paying bills, driving to doctors' visits or

the grocery store, or just checking in to see how they are doing." We measured whether the caregiver lived with the care recipient (1 = yes, 0 = no). We also coded the number of care recipients to whom the caregiver provided care as 1, 2, or 3 or more care recipients. To compare spousal caregivers to adult child and other caregivers, we used the question, "What is this person's relationship to you?" We collapsed the original 14 response categories into four categories: spouse or partner, parent or parent-in-law, other relative, and nonrelative. We combined parent-in-laws with parents because adult children often receive help from their spouse when caring for a parent. We also measured the average number of hours of weekly caregiving and the duration of caregiving. Respondents were asked, "In a typical week, about how many hours [do/did] you spend, on average, helping your [care recipient]?" and "How long [have you been taking/did you take] care of your [care recipient] because of [his/her] disability or illness?" We coded the duration of caregiving in months.

Health Behavior Outcomes

Cigarette Smoking.—In order to assess current smoking status, we used a dichotomous outcome (1 = every day/some days, 0 = not at all) to identify respondents who had smoked 100 or more cigarettes in their lifetime and who had responded to the question, "Do you now smoke cigarettes every day, some days, or not at all?"

Sedentary Behavior.—We constructed a dichotomous measure of sedentary behavior (1 = yes, 0 = no), based on the Department of Health and Human Services physical activity guidelines. Using two constructed variables available in the survey, we deemed a respondent sedentary if at least one of the criteria were not met: (a) at least 3 days/week and 20 min/day of vigorous leisure activity (hard physical effort, such as aerobics, running, soccer, fast bicycling, or fast swimming) or (b) at least 5 days/week and 30 min/day of moderate leisure activity (activities that take moderate physical effort, such as bicycling, dancing, swimming, and gardening).

Eating Behaviors.—We examined two eating behaviors: regular soda intake and fast-food consumption. The 2009 CHIS did not ask respondents about portion sizes—but instead asked about the number of times these food items were consumed.

Modifying a procedure in a recent study (Babey, Jones, Yu, & Goldstein, 2009), we used a conservative estimate of 10 oz of soda per portion. Based upon the American Heart Association's recommended maximum weekly intake for sugar-sweetened beverages of 35 oz/week (Lloyd-Jones et al., 2010), we constructed a dichotomous variable (1 = 3.5 or more per week, 0 = less than 3.5 times per week), using the question, "During the past month, how often did you drink regular soda or pop that contains sugar?" We tabulated the fast-food measure from the question, "In the past 7 days, how many times did you eat fast food, including fast-food meals eaten at work, at home, or at fast-food restaurants, carryout or drive through?" We constructed a dichotomous variable (1 = one or more times per week, 0 = less than one time per week) because fast food consumed one or more times per week is associated with obesity (U.S. Department of Agriculture, 2010). A recent study (Van Wieren, Roberts, Arellano, Feller, & Diaz, 2011) used a similar measure.

Multidimensional Health Behavior Measure.— Multidimensional measures of health outcomes better detect differences between experimental comparison groups than do single-dimension measures (Shaw et al., 1997). Therefore, we created a composite health behavior index. Following the criteria of Scharlach's index of health behavior (Scharlach et al., 1997), we assigned one point for each of the four negative health behaviors (smoking, sedentary behavior, and regular soda and fast-food consumption) and then totaled the scores for each respondent. Following Scharlach, we considered certain respondents to be most at risk for poor health practices. In our study, respondents with three or more points were considered to have high scores and to be most at risk for global, negative health behavior (1 = score of ≥3, 0 = score of <3).

Personal Characteristics.—Race/ethnicity was categorized as non-Hispanic White, African American, Hispanic, Asian/Pacific Islander/Native Hawaiian, and American Indian/Alaskan Native/two or more races. We examined four relationship status types, which reflect potential availability of support to the caregiver: married, living with partner, widowed/separated/divorced, and never married. To achieve a relatively even distribution of responses, education was coded as less than high

school degree/no formal education, high school degree, some college, college degree, and MA/MS/PhD. Total annual household income before taxes was assessed using the 2008 federal poverty guidelines. Federal Poverty Level (FPL) was categorized as: 0%–99% FPL, 100%–199% FPL, 200%–299% FPL, and 300% or more FPL. To assess work status, we dichotomized employment into those who worked or did not work where 1 = part/full time and 0 = employed but not at work/not employed. Self-rated health is one of the most frequently used measures of overall general health (Eriksson, Unden, & Elofsson, 2001). In order to control for baseline differences in health that might have affected health behavior, we used respondents' ratings of their overall health on a 5-point scale from poor to excellent and collapsed the scale into three categories: excellent/very good, good, and fair/poor.

Social Resources.—We chose neighborhood safety as a measure of social resources because safety is associated with physical activity levels (Suminski, Poston, Petosa, Stevens, & Katzenmoyer, 2005), smoking, and depression (Echeverria, Diez-Roux, Shea, Borrell, & Jackson, 2008). Respondents were asked, "Do you feel safe in your neighborhood all/most/some/none of the time?" and a dichotomous variable was constructed (1 = all or most of the time, 0 = some or none of the time).

Psychological Distress.—Psychological distress was measured using the Kessler (K6) scale, which assessed how often in the past 30 days respondents felt nervous, hopeless, restless, depressed, worthless, or that everything was an effort. The K6 scale was designed for use in the redesigned U.S. National Health Interview Survey and can be used to screen for serious mental illness in general populations (Kessler et al., 2002). Scores were categorized into low (0–5), moderate (6–12), and serious (13–24) distress levels because the optimal cut point for measuring serious psychological distress is a score of 13 (Kessler et al., 2003) and because in the 2009 CHIS moderate psychological distress was measured using scores from 6 to 12.

Statistical Analyses

Chi-square tests, *t* tests, and analysis of variance accounting for survey weights were used to assess the statistical significance of the bivariate relation-

ships between caregiver status and measures of health behaviors, personal resources, and psychological distress. We performed separate logistic regressions to model each of the four binomial outcome variables using Stata version 11. For each outcome, two separate models were fitted. The first model estimated the effects of caregiving on the relative odds of each outcome while controlling for personal and social resources and psychological distress. The second estimated the effects, among caregivers, of caregiver characteristics on the relative odds of each outcome while controlling for personal and social resources and psychological distress. Odds ratios with 95% confidence intervals were reported for the categorical outcomes from the logistic regressions. All the analyses were conducted on weighted CHIS data, and variances in all analyses were estimated using the Jackknife method with 80 replications to take into account the survey's complex sampling design.

Results

Table 1 presents descriptive statistics and health behaviors for Baby Boomer caregivers and non-caregivers. Caregivers were slightly older than non-caregivers ($p = .004$) and considerably more likely to be women ($p < .0001$) and to have higher education ($p < .0001$) and income levels ($p = .004$) but slightly less likely to work ($p = .007$). Caregivers reported marginally better health status ($p = .06$) compared with non-caregivers, whereas levels of reported distress among caregivers and non-caregivers were significantly different ($p = .01$). Caregivers were more likely to smoke than non-caregivers ($p = .002$), but the percentages were similar between caregivers and non-caregivers for sedentary behavior, soda and fast-food consumption, and poor global health behavior.

The caregiver–care recipient relationship was significantly related to personal characteristics and health behavior. The percentages of caregivers providing care to different types of care recipients significantly varied by race and ethnicity ($p = .001$). Spousal caregivers were less likely to be highly educated compared with adult children caregivers or caregivers of other relatives ($p < .001$). Additionally, a greater percentage of adult children caregivers had incomes at 300% or more of FPL compared with caregivers in other caregiver relationships ($p < .0001$). We also found significant differences in self-rated health ($p < .001$), psychological distress levels ($p = .003$), smoking behavior ($p = .0497$),

Table 1. Baby Boomer Personal Characteristics, Social Resources, Psychological Distress, and Health Behaviors—By Caregiver Status and By Caregiver Relationship Type

	Non-caregivers	Caregivers				
	Total	Total	Spouse	Adult child	Other relative	Nonrelative
	(N = 12,941)	(N = 5,688)	(N = 454)	(N = 3,160)	(N = 975)	(N = 1,099)
Personal characteristics						
Age** (range = 45–63; $M \pm SD$)	53.10 ± 0.07	53.59 ± 0.11	54.9 ± 0.4	53.6 ± 0.1	53.2 ± 0.4	53.3 ± 0.3
Race/ethnicity***,††						
Non-Hispanic White	51.5	63.1	63.0	66.4	58.2	57.4
African American	6.3	6.0	2.4	4.9	7.3	9.8
Hispanic	27.5	19.5	23.5	17.5	23.2	20.8
Asian/Hawaiian/PI	12.8	8.5	8.7	9.6	6.2	6.9
Alaska Native/AI/two or more races	1.9	2.9	2.5	1.5	5.1	5.1
Gender*** (% women)	47.4	59.8	59.9	59.4	64.0	57.1
Education***,††						
Postgraduate degree (MA/MS/PhD)	14.4	16.0	10.2	18.1	16.8	11.1
College degree	23.3	25.4	23.5	28.0	23.7	19.2
Some college	21.9	28.1	34.4	27.5	25.0	30.4
High school degree	22.3	20.8	20.7	18.2	21.9	28.2
<High school	18.2	9.8	11.2	8.3	12.6	11.1
FPL**,*,†,††						
0%–99% FPL	11.7	8.8	13.8	7.3	9.6	11.1
100%–199% FPL	15.1	13.8	14.5	10.5	16.7	21.7
200%–299% FPL	13.2	11.9	14.9	11.3	11.6	13.2
300% FPL	60.0	65.4	56.8	71.0	62.1	53.9
Marital status*						
Married	69.4	65.6	83.3	69.8	61.8	48.1
Living with partner	5.5	6.3	5.0	4.8	6.9	11.0
Widowed/separated/divorced	16.1	19.9	11.3	16.7	27.2	27.0
Never married	9.0	8.2	0.4	8.8	4.2	13.9
Employment status*,*,†						
Working	71.5	67.8	62.7	70.4	62.4	67.0
Not working	28.5	32.2	37.3	29.6	37.6	33.0
Self-rated health†						
Excellent/very good	48.6	52.2	52.5	55.8	41.8	50.5
Good	29.2	28.4	22.8	27.3	36.1	26.8
Fair/poor	22.2	19.4	24.7	16.9	22.1	22.8
Social resources						
Neighborhood safety						
Safe some/none of the time	6.9	6.6	7.2	6.4	5.9	7.4
Safe all/most of the time	93.1	93.4	92.8	93.6	94.1	92.6
Psychological distress						
Distress level*,†						

(Table continues on next page)

Table 1. *(Continued)*

	Non-caregivers	Caregivers				
	Total	Total	Spouse	Adult child	Other relative	Nonrelative
	(N = 12,941)	(N = 5,688)	(N = 454)	(N = 3,160)	(N = 975)	(N = 1,099)
Low	82.7	79.4	72.6	82.5	71.4	80.0
Moderate	14.2	16.0	18.5	13.9	21.3	16.6
Serious	3.1	4.6	8.9	3.6	7.3	3.4
Health behaviors						
Current smoker***,+ (% yes)	12.9	16.0	21.6	13.9	16.3	19.9
Sedentary behavior (% no)	80.3	79.5	80.2	79.3	79.5	79.5
Drank soda 3.5 or more times per week (% yes)	12.8	14.6	14.1	12.6	17.2	18.5
Ate fast food one or more times in past week (% yes)	56.9	59.4	63.1	57.5	61.4	62.2
Engaged in three or more poor health behaviors (% yes)	14.5	16.7	18.0	15.3	18.2	19.2

Notes: Data are from the 2009 California Health Interview Survey and are weighted. AI = American Indian; FPL = Federal Poverty Level; PI = Pacific Islander.

* $p < .05$; ** $p < .01$; *** $p < .001$ for the statistical significance of the bivariate relationships between caregiver status and measures of health behaviors, personal resources, and psychological distress.

+ $p < .05$; ++ $p < .01$; +++ $p < .001$ for the statistical significance of the bivariate relationships between spousal and other caregiver relationship type and measures of health behaviors, personal resources, and psychological distress.

and working status ($p = .04$) across caregiver relationship categories.

Table 2 presents bivariate correlations between selected study variables. Correlations between study variables were low with the exception of several health behavior variables, including the composite poor health behavior measure, excessive soda consumption, and smoking status. The distress variable and the health behavior variables had correlations of .15 or lower.

Table 3 shows results for the first multivariate model of the effect of caregiver status on health behaviors. Largely consistent with H1, the odds of overall poor health behavior were nearly 1.3 times as great among caregivers compared with non-caregivers ($p = .02$), controlling for all other covariates. The odds of smoking ($p = .001$) and regular soda ($p = .001$) and fast-food consumption ($p = .02$) ranged from 1.2 to 1.4 times as great for caregivers compared with non-caregivers, controlling for all other covariates.

Table 4 shows results for the second multivariate model that estimated the effect of caregiving characteristics on the health behaviors of Baby Boomer caregivers. Results showed that, contrary to H2, controlling for all other factors, the odds of overall and individual negative health behaviors were not significantly higher among spousal caregivers, compared with adult child, other relative, and nonrelative caregivers. For H3, we did not find significant associations between an additional hour of weekly or additional month of total caregiving and any of the health-related behavior outcomes, after controlling for all other factors.

Discussion

Using an adaptation of a theoretical stress model by Vitaliano and colleagues (2002), our study had several noteworthy findings regarding Baby Boomer caregiving and health behaviors. First, caregivers largely had greater odds of engaging in negative health behaviors—smoking and regular soda and fast-food consumption. These findings are clinically relevant because fast-food portion sizes are high in energy content, averaging as much as 1,000 calories per meal (Dumanovsky, Nonas, Huang, Silver, & Bassett, 2009) or half of a standard 2,000-calorie daily diet. Both regular fast-food and soda intake are known correlates of obesity (Babey et al., 2009; Rosenheck, 2008). Although caregiving was not associated with greater odds of sedentary behavior, our results suggest that

Table 2. Bivariate Correlations for Selected Study Variables Among Baby Boomer Caregivers (N = 5,688)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. CG hours per week												
2. CG months	.05											
3. Lives with CG	.27	.17										
4. Current smoker	.03	.05	.09									
5. Sedentary behavior[a]	.02	.02	.03	−.02								
6. Soda[b]	−.02	.02	.00	.18	.01							
7. Fast food[c]	−.03	−.03	.02	.04	.07	.20						
8. Poor health behavior[d]	.01	.01	.03	.50	.15	.71	.33					
9. Age	.04	.05	.01	−.09	.00	−.11	−.08	−.11				
10. Gender	.11	−.02	−.01	−.09	.10	−.16	−.08	−.11	.01			
11. Neighborhood safety	.02	−.01	.04	−.04	.01	−.01	−.02	−.01	.09	−.05		
12. Working status	−.04	.03	.01	−.02	−.04	−.03	.00	−.03	−.08	−.14	.08	
13. Distress	.04	.01	.07	.15	.01	.09	.02	.11	−.11	.08	−.18	−.19

Notes: Data are from the 2009 California Health Interview Survey and are weighted. CG = caregiver.
[a]Did not meet activity guidelines, that is, did not meet criteria for minimum recommended level of either moderate physical activity (5 days/week and 30 min/day) or vigorous physical activity (3 days/week and 20 min/day) for adults.
[b]Consumed soda 3.5 or more times per week.
[c]Consumed fast food one or more times per week.
[d]Engaged in three or more negative health behaviors, that is, currently smoked, did not meet recommended minimum physical activity guidelines for adults, consumed soda 3.5 or more times per week, and consumed fast food one or more times per week.

caregivers may be globally at risk for excess morbidity stemming from the accumulation of poor health habits. Excess morbidity has been shown to be associated with increased disability-adjusted life years (Reynolds, Saito, & Crimmins, 2005).

Second, according to the proposed stress model, our results suggest that psychological distress among caregivers is not an independent predictor of negative health behavior. We did observe a significant bivariate relationship between caregiver status and distress levels, which corroborates earlier findings (Dura, Stukenberg, & Kiecolt-Glaser, 1991; Pinquart & Sorensen, 2003b). However, in the multivariate logistic model, the distress variable was no longer statistically significant. These results

contradict those of an earlier, smaller study in which caregiver depression was significantly correlated with lower levels of self-care (Connell, 1994) and those of a study of a health promotion program in which those less depressed at baseline had higher program retention rates compared with those more depressed at baseline (Castro, Wilcox, O'Sullivan, Baumann, & King, 2002).

Third, the type of relationship between the caregiver and the care recipient was not associated with increased odds of poor health behavior. Perhaps, counter to our hypothesis, spousal caregiving brings about positive health benefits to the spousal caregiver (Beach, Schulz, Yee, & Jackson, 2000). However, we noted significantly different

Table 3. Adjusted Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Logistic Regressions Estimating the Effect of Caregiver Status on the Odds of Baby Boomers Engaging in Negative Health Behaviors (N = 18,629)

Characteristic	Current smoker		Sedentary[a]		Soda[b]		Fast food[c]		Poor health behaviors[d]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Caregiver (reference = no)	1.36	1.14–1.61	0.94	0.80–1.11	1.41	1.16–1.73	1.17	1.03–1.34	1.27	1.04–1.56

Notes: Data are from the 2009 California Health Interview Survey and are weighted. The model is adjusted for age, race, gender, education, Federal Poverty Level, marital and employment status, self-rated health, neighborhood safety, and psychological distress level.
[a]Did not meet activity guidelines, that is, did not meet criteria for minimum recommended level of either moderate physical activity (5 days/week and 30 min/day) or vigorous physical activity (3 days/week and 20 min/day) for adults.
[b]Consumed soda 3.5 or more times per week.
[c]Consumed fast food one or more times per week.
[d]Engaged in three or more negative health behaviors, that is, currently smoked, did not meet recommended minimum physical activity guidelines for adults, consumed soda 3.5 or more times per week, and consumed fast food one or more times per week.

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Table 4. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Logistic Regression Estimating the Effects of Baby Boomer Caregiver Characteristics on the Odds of Engaging in Negative Health Behaviors (N = 5,688)

Characteristic	Current smoker OR	Current smoker 95% CI	Sedentary[a] OR	Sedentary[a] 95% CI	Soda[b] OR	Soda[b] 95% CI	Fast food[c] OR	Fast food[c] 95% CI	Poor health behaviors[d] OR	Poor health behaviors[d] 95% CI
Care relationship (reference = spouse)										
Adult child	0.74	0.36–1.54	1.05	0.62–1.78	0.83	0.39–1.76	0.73	0.47–1.13	0.80	0.37–1.77
Other relative	0.63	0.29–1.36	0.90	0.51–1.61	0.82	0.36–1.85	0.82	0.52–1.27	0.66	0.30–1.47
Nonrelative	0.82	0.37–1.82	1.01	0.58–1.74	0.87	0.35–2.17	0.76	0.48–1.22	0.67	0.27–1.65
Caregiving intensity										
Number of caregiving hours per week	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00
Number of months of caregiving	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00	1.00	1.00–1.00
Number of care recipients (reference = 1)										
2	0.96	0.66–1.40	0.91	0.66–1.25	0.87	0.56–1.37	1.02	0.82–1.28	1.09	0.75–1.60
3	1.40	0.84–2.33	0.82	0.51–1.33	1.54	0.94–2.52	1.01	0.74–1.37	1.63	1.00–2.65
Living situation (reference = lives with care recipient)										
Does not live with care recipient	1.37	0.90–2.08	1.11	0.79–1.56	0.83	0.55–1.25	1.02	0.82–1.27	0.99	0.62–1.56
Age (in years; range = 45–63)	0.96	0.93–0.99	1.00	0.98–1.02	0.95	0.92–0.98	0.97	0.95–0.99	0.95	0.92–0.98
Gender (reference = men)										
Women	0.54	0.42–0.71	1.79	1.43–2.24	0.34	0.25–0.47	0.68	0.55–0.83	0.47	0.35–0.64
Race/ethnicity (reference = non-Hispanic White)										
African American	1.23	0.75–2.04	1.31	0.81–2.10	1.63	0.82–3.22	1.85	1.17–2.91	1.99	1.04–3.78
Hispanic	0.64	0.39–1.05	1.07	0.69–1.65	1.07	0.64–1.78	1.27	0.93–1.75	0.77	0.50–1.18
Asian/Hawaiian/PI	0.69	0.33–1.46	0.79	0.44–1.42	1.25	0.51–3.03	1.37	0.94–1.99	0.98	0.42–2.27
Alaska Native/AI/two or more races	0.72	0.36–1.45	1.12	0.50–2.52	1.81	0.98–3.37	1.82	0.94–3.52	1.58	0.89–2.82
Education (reference = MA/MS/PhD)										
College degree	1.83	1.04–3.21	1.03	0.76–1.40	3.15	1.72–5.79	1.14	0.88–1.49	3.36	1.80–6.29
Some college	2.78	1.86–4.15	1.42	1.05–1.92	3.80	2.20–6.55	1.56	1.26–1.94	3.84	2.21–6.70
High school degree	3.36	2.07–5.46	1.31	0.80–2.16	5.31	3.00–9.42	1.95	1.46–2.61	5.47	3.09–9.69
<High school	3.71	1.93–7.13	0.86	0.40–1.86	7.84	3.28–18.75	1.59	0.99–2.54	6.46	2.84–14.70
FPL (reference = 300% FPL)										
0%–99% FPL	1.31	0.72–2.38	1.10	0.65–1.84	0.92	0.50–1.71	0.53	0.36–0.77	0.82	0.43–1.59
100%–199% FPL	1.26	0.80–1.99	1.34	0.75–2.38	1.03	0.65–1.65	0.80	0.63–1.03	1.28	0.82–2.00
200%–299% FPL	1.12	0.71–1.77	0.87	0.58–1.30	1.34	0.78–2.31	0.95	0.69–1.29	1.38	0.85–2.23
Marital status (reference = married)										
Living with partner	3.18	2.11–4.79	0.95	0.67–1.36	1.12	0.60–2.07	0.92	0.64–1.33	1.72	1.11–2.66
Widowed/separated/divorced	2.08	1.40–3.11	0.87	0.61–1.24	2.24	1.42–3.54	1.37	1.06–1.78	2.52	1.65–3.83
Never married	1.37	0.89–2.11	0.85	0.52–1.38	0.75	0.48–1.17	1.00	0.73–1.38	0.90	0.59–1.35
Self-reported health (reference = excellent/very good)										
Good	1.28	0.90–1.84	2.59	1.77–3.78	1.48	1.00–2.18	1.39	1.13–1.71	1.67	1.15–2.43
Fair/poor	1.72	1.01–2.93	1.94	1.28–2.96	1.17	0.63–2.16	1.20	0.85–1.69	1.86	1.01–3.42

(Table continues on next page)

Table 4. (Continued)

Characteristic	Current smoker		Sedentary[a]		Soda[b]		Fast food[c]		Poor health behaviors[d]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Neighborhood safety (reference = safe all/most of the time)										
Safe some/none of the time	1.37	0.72–2.60	1.29	0.71–2.33	1.81	0.79–4.16	0.95	0.63–1.44	1.81	0.87–3.77
Employment status (reference = working)										
Not working	0.89	0.61–1.30	0.98	0.73–1.30	1.10	0.71–1.69	1.04	0.84–1.29	0.97	0.65–1.45
Distress level (reference = low)										
Moderate	1.10	0.78–1.55	1.05	0.73–1.49	1.33	0.89–1.98	1.00	0.78–1.29	1.20	0.84–1.73
Serious	2.27	0.99–5.21	0.57	0.22–1.50	1.72	0.62–4.80	0.89	0.49–1.62	1.57	0.69–3.59

Notes: Data are from the 2009 California Health Interview Survey and are weighted. FPL = Federal Poverty Level; PI = Pacific Islander; AI = American Indian.
[a]Did not meet activity guidelines, that is, did not meet criteria for minimum recommended level of either moderate physical activity (5 days/week and 30 min/day) or vigorous physical activity (3 days/week and 20 min/day) for adults.
[b]Consumed soda 3.5 or more times per week.
[c]Consumed fast food one or more times per week.
[d]Engaged in three or more negative health behaviors, that is, currently smoked, did not meet recommended minimum physical activity guidelines for adults, consumed soda 3.5 or more times per week, and consumed fast food one or more times per week.

baseline levels of psychological distress among spousal and other caregivers. Higher distress levels among spousal caregivers may reflect smaller social networks and limited time and resources (Ostwald, 2009). Additionally, our hypothesis that more weekly hours of caregiving and longer duration of caregiving would generate more stress leading to poor behavior (H3) was not substantiated. But, others have also found mixed results with regard to the amount of caregiving and outcomes (Schulz, O'Brien, Bookwala, & Fleissner, 1995). We particularly expected that duration of caregiving would indicate increased chronic stress affecting behavior. However, our negative results may reflect what is described by the "trait hypothesis," which indicates that caregiver traits remain stable because caregivers learn to cope even as new demands arise (Pinquart & Sorensen, 2003a).

Like all studies, ours has limitations that are worth mentioning. First, the cross-sectional nature of the data prevents us from asserting causation from caregiving to health behavior. For example, it was possible that those who smoked, drank soda, or ate fast food regularly were more likely to be caregivers than non-caregivers. Also, negative behaviors, such as soda or fast-food consumption, may have increased respondents' distress levels, leading us to overestimate the magnitude of the stress–behavior relationship. However, we found significant results in a data set from a large representative sample of non-institutionalized Baby Boomers. Compared with studies with convenience samples of highly distressed caregivers, our study is less likely to overstate the negative health effects of caregiving.

Second, the number of caregiving measures available in the data set was limited and did not include measures commonly found in other caregiver surveys, such as the care recipient's dependency level, caregiver perceived burden level, self-esteem, self-concept, or coping style (Vedhara et al., 2000). If self-efficacy or coping style lowers other types of distress beyond what we measured with the Kessler K6, our results underestimated the association of distress and health behavior. However, we did include a widely used, validated measure of psychological distress that likely captured, in part, respondents' responses to stress.

Conclusion

To our knowledge, this study is the first to examine caregiving and health behaviors among

U.S. Baby Boomers. Given that California is the state with the country's largest population of Baby Boomers (U.S. Census Bureau, 2006), our findings can serve as a bellwether for Baby Boomer caregivers nationwide. We found that caregiving is associated with poor health behaviors that put Baby Boomer caregivers' health at risk in the long term. Therefore, addressing negative health behaviors among caregivers should become a priority for policy makers. Certain studies indicate that caregivers may lack social support (Ostwald, 2009) or may be too overburdened with responsibility to engage in health-promoting activities (Sisk, 2000). However, health promotion programs (Castro et al., 2002) may be of value to caregivers. The importance of addressing negative health behaviors among Baby Boomers cannot be overstated. The rising rates of obesity, cardiovascular disease, and diabetes in this population are cause for alarm, and the results from this study suggest that caregiving can contribute to the excess morbidity and mortality Baby Boomers are likely to face as they age in the coming decades.

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