



## CAREGIVING ANXIETY AND DEPRESSION: THE ROLE OF DEMOGRAPHICS AND CAREGIVING CHARACTERISTICS

**Henry Egbuchiem<sup>1\*</sup>, MD, Adeleye A. Adaralegbe<sup>2</sup>, PhD, Khuzeman Abbasi<sup>3</sup>, MD,  
Evaristus Chinonye Ezema<sup>4</sup>, MD, MSc, FMCA, Maureen G. Boms<sup>5</sup>, MBCh, MPH,  
Nnenna Ann Ukoha<sup>6</sup>, BSc, MBBS and Akepi Oshobe<sup>7</sup>, MD.**

<sup>1</sup>Everest Foundation Scholar, Los Angeles, California, United States of America.

<sup>2</sup>Department of Allied Health Sciences, University of Connecticut, Storrs.

<sup>3</sup>Institute for Health, Health Care Policy and Aging Research, Rutgers University, New Jersey, United States of America.

<sup>4</sup>Essen Medical Group, Bronx, New York.

<sup>5</sup>School of Public Health, University of Alabama, Birmingham.

<sup>6</sup>Royal Cross Methodist Hospital, Ugwueke, Nigeria.

<sup>7</sup>Ashtabula County Medical Center, Ashtabula, Ohio, USA.

**\*Corresponding Author: Henry Egbuchiem**

Everest Foundation Scholar, Los Angeles, California, United States of America.

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### ABSTRACT

Medical advancement and recent improvement in health care services have led to an increase in the population of older adults worldwide. This increase resulted in a rise in the prevalence of chronic diseases which necessitates the need for caregiving. The numerous burdens of caregiving and the long-term effects of providing care are known, especially with respect to the development of anxiety and depression among caregivers. In addition to evaluating the influence of sociodemographic factors on caregiving, this study examined how the types of caregiving provided is associated with anxiety and depression. We analyzed data from the 3rd iteration (Cycle 3) of the Health Information National Health Survey Trends 5 (HINTS 5) representing a cohort of about 3439 respondents. A Pearson's Chi square correlation was used to evaluate the bivariate relationship between respondents' demographic information, caregiving characteristics, depression and anxiety. We used a multivariable logistic regression model to examine the relationship between statistically significant predictors with depression and anxiety. The goodness-of-fit of the multivariate model was then assessed using the Hosmer and Lemeshow Test. The mean age of respondents in the study is 56.93±16.9 years, of which anxiety and depression were significantly associated with younger age (OR=0.98, p <0.05), female gender (OR=1.67, p <0.05), being White (OR=1.74, p <0.05), earning less than \$50,000, and being single/divorced/widowed. Even though provision of caregiving to individuals with multiple conditions, one's child, and a friend were associated with anxiety and depression, caregiving for patients multiple conditions was the only significant predictor of depression and anxiety. This study sheds light on the influence of demographic factors on caregiving burden, with emphasis on mental health of caregivers. We hope that future policy developments would be geared towards better protecting caregivers and creating preventive measures based on already established factors to mitigate the development of anxiety and depression among caregivers.

**KEYWORDS:** Caregiving, Depression, Anxiety, Elderly, Mental, Health.

### INTRODUCTION

Caregiving in its simplest form is the act of providing physical and emotional needs for others. The National Alliance for Caregiving estimates that about 29% (65.7 million) of the United States adult population, involving over 31% of all U.S households, served as family caregivers for an ill relative or a relative with a disability in 2011.<sup>[1]</sup> Even though 65.7 million Americans are currently directly or indirectly involved in caregiving,

there is still an increase demand for more caregivers. This increase is a result of the unique demographics of the aging populations and the medical advancement of the recent years.<sup>[2]</sup> Several studies elucidated the numerous burdens of caregiving and the long-term effects of providing care.<sup>[3-6]</sup> Broadly speaking, caregiver's burden can be described as both perceived and observable<sup>[7]</sup>, and it is defined as the strain or load borne by a person who cares for a chronic condition, person with disability, or

family member who is an older adult.<sup>[8]</sup> This burden has been described as multidimensional responses to physical, psychological, emotional, social, and financial stressors associated with the care giving experience.<sup>[9]</sup>

Several factors such as medical or physical health concern, secondary strains (in employment, finances, relationships and quality of life), mental health concerns particularly depression and anxiety, appear to play major roles in the wellbeing of caregivers.<sup>[10]</sup> Studies also show a correlation between caregiving and the development of depression and anxiety.<sup>[11-14]</sup> Hence the need to not only understand the factors that influence the development of depression and/or anxiety among caregivers but also find ways to mitigate these factors. In a cross-sectional study conducted in southwest Ethiopia, the prevalence of depression among caregivers of patients with severe mental illness was found to be 19%<sup>[15]</sup>, another study carried out in Egypt showed that female caregivers in a psychiatric clinic who specifically took care of patients with mental disorders had an even higher prevalence depression, 34%.<sup>[16]</sup>

Studies have shown that the relationship between caregivers and the person they provide care for influences the quality of life of caregivers. Researchers in Singapore<sup>[6]</sup> reported that spousal caregivers had a significantly low life quality when compared to adult children caregivers. The study further elucidated that a non-immediate family caregiver had better overall wellbeing as opposed to immediate family members (spouse and adult children caregivers). Immediate family caregivers who utilized formal caregiving in addition to the care they provide also reported a poorer self-rated general health. The authors concluded that a better understanding between caregivers and formal caregiving institutions is necessary.

Aside from the relationship between caregivers and their recipient, other factors such as age, gender, socioeconomic status, educational level, and hours of caregiving, have been shown to influence the caregiving burden.<sup>[10]</sup> For instance, a Greek study reported that caregivers who are depressed and or have anxiety usually share the following traits: female gender, caring for male patients with lung cancer, caring for non-surgical patients, cohabiting with patients, being younger than their patients, having a private means of transportation to a hospital, having previous care experience, and possessing an increased degree of general burden.<sup>[17]</sup> Another Brazilian cross-sectional study described depression, age greater than 60 years, recent patient crises, contact days, number of family members receiving care, and having no help with caregiving as predictors of caregiving.<sup>[18]</sup>

From the foregoing, we sought to explore how sociodemographic factors of caregiving characteristics influence the subsequent development of depression or anxiety among caregivers in our study population. We

will further assess any relationship between the medical diagnoses<sup>[19]</sup> of the patients and caregivers developing depression or anxiety or both. To the best of our knowledge, there are no studies that evaluate the relationship between the type of morbidity cared for and depression as well as anxiety. We also sought to evaluate if there is any significant change in the caregiving burden among individuals who provide care to patients with a single disease condition in comparison to those who care for patients with multiple illnesses. We believe that the findings from to this research questions have the propensity to cause policy changes concerning the health improvement for caregivers.

## METHODOLOGY

### Study Design

This study utilized data from the Health Information National Trends Survey (HINTS), a nationally representative survey administered every few years by the National Cancer Institute (NCI) since 2003. The survey provides a comprehensive assessment of the American public's current access to the use of information about cancer across the various cancer continuum from cancer prevention, early detection, diagnosis, treatment, and survivors. It has a target population of non-institutionalized individuals or people 18 years or older living in the United States. For this study we used the 3rd iteration (also known as Cycle 3) of the most recent HINTS 5 data set, where in addition to the standard HINTS content, special interest topics specifically on health behaviors such as dietary intake and attention to caloric consumption, sleep patterns, tobacco use and attitudes about e-cigarette use, and lifestyle guidelines were explored. HINTS 5 Cycle 3 data was collected between January 22 to April 3, 2019, with a goal of obtaining 3,500 questionnaires. Survey was conducted exclusively by mail and of the total of 14,730 questionnaires sent out, only 3,439 (23.3%) were completed, 43(0.3%) were refusals, 1,273 (8.6%) went undeliverable, and 9,975 (67.7%) were nonresponses.

### Sampling Method

The sample strategy for HINTS 5 Cycle 3 consisted of a two staged design. In the first stage, a stratified sample of addresses was selected from a file of residential addresses and for the second stage, an adult individual was selected within each sample household. The sample frame for this iteration of HINTS data was from a database of addresses used by Marketing Systems Group (MSG) to provide a random sample of addresses. The sample of addresses was stratified into 2 groups. The first was the addresses in areas of high concentration of minority populations and the second, addresses in areas of minority with low concentration. The high and low minority strata were formed using census tract level characteristics from the 2013-2017 American Community Survey data file. A more detailed sampling method have been described elsewhere.<sup>[20,21]</sup>

## Measures

Outcome variable was clinical depression and anxiety as a single dichotomous variable. Respondents were asked the question: “has a doctor or other health professional ever told you that you had depression or anxiety disorder?” Response was recorded as “Yes” or “No”. Predictors of depression or anxiety were provision of Caregiving, characteristics of the care provided, and sociodemographic variables. For ‘Provision of Caregiving’, respondents were asked if they provide caregiving or not and response was dichotomous ‘Yes’ or ‘No’. Those who provided caregiving were further asked about the relationship between them and the care recipient with the following choices: child/children, spouse/partner, parent, another family member, or a friend/other non-relative. Those who have multiple relationship with their care recipients were coded as ‘Multiple Relationship’. They were also asked if the caregiving they provide was professionally or not, and the number of hours they spend per week (continuous) in providing care. We categorized the number of hours per week into ‘0 – 20’, ‘21 – 40’, and ‘> 40 hours’.

Furthermore, care providers were asked about the kinds of medical conditions that they provide care for. These included cancers, Alzheimer’s disease/dementia, orthopedic/musculoskeletal issues, mental/behavioral issues, neurological/developmental conditions, chronic conditions e.g., hypertension, acute conditions, aging/age-related issues, not sure/don’t know, and other conditions. We categorized these conditions into: (i)

Medical, consisting of acute and chronic conditions as well age-related issues, (ii) Physical disabilities which included orthopedic/musculoskeletal and neurodevelopmental issues, (iii) Behavioral, consisting of dementia and mental/behavioral issues, (iv) Multiple conditions, (v) Other conditions, and (vi) Not sure of the conditions care is provided for. Lastly, sociodemographic characteristics (age, gender, household income, educational attainment, ethnicity, and relationship status) were dichotomized as shown in table 1.

## Data Analysis

All statistical analyses were performed using IBM SPSS version 27.0 and all estimates were evaluated for statistical significance based on 95% confidence intervals and  $p < 0.05$ . We calculated descriptive statistics for all variables, which was further stratified by depression and anxiety, the outcome variable. Furthermore, the bivariate relationship between the respondents’ demographic characteristics as well as caregiving characteristics and the outcome variable was explored using Pearson Chi-square correlations. Variables with statistically significant  $p$  value (i.e.,  $< 0.05$ ) were entered into multivariable logistic regression model. Odds ratios and corresponding 95 % confidence intervals were used to indicate significant variable. The goodness-of-fit of the final multivariate model was assessed using the Hosmer and Lemeshow Test.<sup>[22]</sup>

## RESULTS

**Table 1: Participants’ characteristics, stratified by Depression/Anxiety.**

Characteristics	Depression/Anxiety			X <sup>2</sup>	df	P
	Total (%)	Yes (%)	No (%)			
<b>Age (years): Mean (±SD)</b>	56.93 (±16.9)	53.54 (±16.1)	57.65 (±16.9)	7.26		<b>0.044</b>
<b>Gender</b>						
Female	2769 (51.2)	707 (25.5)	2062 (74.5)	60.44	1	<b>0.000</b>
Male	2074 (48.8)	337 (16.2)	1737 (83.8)			
<b>Ethnicity</b>						
Whites (Non-Hispanics)	3005 (63.0)	701 (23.3)	2304 (76.7)	10.59	1	<b>0.001</b>
Others	1767 (37.0)	341 (19.3)	1426 (80.7)			
<b>Household Income</b>						
< 50,000	2090 (44.3)	569 (27.2)	1521 (72.8)	55.75	1	<b>0.000</b>
> 50,000	2625 (55.7)	476 (18.1)	2149 (81.9)			
<b>Education</b>						
Below Bachelors	2802 (54.1)	634 (22.6)	2168 (77.4)	4.97	1	<b>0.027</b>
Bachelors or higher	2381 (45.9)	478 (20.1)	1903 (79.9)			
<b>Relationship status</b>						
Single/Divorced/Widowed	2363 (45.7)	596 (25.2)	1768 (74.8)	36.96	1	<b>0.000</b>
Married/Partnered	2806 (54.3)	512 (18.2)	2294 (81.8)			
<b>Provide Caregiving</b>						
Yes	813 (15.7)	224 (27.6)	589 (72.4)	22.26	1	<b>0.000</b>
No	4363 (84.3)	880 (20.2)	3483 (79.8)			

Table 1 shows the sociodemographic and caregiving characteristics of the participants stratified by the depression/anxiety. All of the sociodemographic predictors were statistically significantly predictors of

depression or anxiety. The mean age of participants in this study was 56.93±16.9 years, of which depression or anxiety was significantly associated with younger age (53.54±16.1 years). Slightly more than half, 51% and

55.7%, of the participants were females and have an annual income above \$50,000, respectively. Being female (25.5%) was associated with higher depression or anxiety when compared to males (16.2%), whereas earning a higher income is significantly related to lower depression and anxiety. Respondents were mainly non-Hispanic Whites (63%) and being white (23.3%) also significantly predicted a higher depression/anxiety than

other ethnicities (19.3%). More than half (54%) were married or in a co-habiting relationship and earned below bachelor's degree, but being married (18%) was associated with lower depression or anxiety compared to being single, divorced, or widowed (25%). Only about 16% of the respondents provide caregiving and the provision of care was associated with a higher rate of depression or anxiety ( $p = 0.0000$ ).

**Table 2: Caregiving characteristics, stratified by Depression/Anxiety.**

Characteristics	Depression/Anxiety			X2	df	P
	Total (%)	Yes (%)	No (%)			
<b>Care Recipient's Condition</b>						
Medical						
Yes	99 (13.1)	19 (19.2)	80 (80.8)	3.19	1	0.087
No	657 (86.9)	182 (27.7)	475 (72.3)			
Behavioral						
Yes	104 (13.8)	26 (25.0)	78 (75.0)	0.156	1	0.811
No	652 (86.2)	175 (26.8)	477 (73.2)			
Physical Disability						
Yes	73 (10.0)	15 (20.5)	58 (79.5)	1.51	1	0.265
No	683 (90.0)	186 (27.2)	497 (72.8)			
Other Conditions						
Yes	74 (10.0)	20 (27.0)	54 (73.0)	0.01	1	0.891
No	682 (90.0)	181 (26.5)	501 (73.5)			
Not Sure of Condition						
Yes	37 (4.9)	7 (18.9)	30 (81.1)	1.17	1	0.343
No	719 (95.1)	194 (27.0)	525 (73.0)			
Multiple Conditions						
Yes	369 (48.8)	114 (30.9)	255 (69.1)	6.85	1	<b>0.011</b>
No	387 (51.2)	87 (22.5)	300 (77.5)			
<b>Hours spent per week on Caregiving</b>						
0 – 20	436 (64.0)	115 (26.4)	321 (73.6)	1.22	2	0.543
21 – 40	99 (14.5)	31 (31.3)	68 (68.7)			
> 40	146 (21.4)	37 (25.3)	109 (74.7)			
<b>Caregivers Relationship to Recipients</b>						
Child						
Yes	148 (18.2)	30 (20.3)	118 (79.7)	4.81	1	<b>0.032</b>
No	665 (81.8)	194 (29.2)	471 (79.8)			
Parent						
Yes	210 (25.8)	58 (27.6)	152 (72.4)	0.00	1	1.000
No	603 (74.2)	166 (27.5)	437 (72.5)			
Another family						
Yes	80 (9.8)	22 (27.5)	58 (72.5)	0.000	1	1.000
No	733 (90.2)	202 (27.6)	531 (72.4)			
Friend						
Yes	45 (5.5)	19 (42.2)	26 (57.8)	5.14	1	<b>0.038</b>
No	768 (94.5)	205 (26.7)	563 (73.3)			
Multiple Relationship						
Yes	85 (10.5)	22 (25.9)	63 (74.1)	0.133	1	0.798
No	728 (89.5)	202 (27.7)	526 (72.3)			
<b>Provide Care Professionally</b>						
Yes	80 (9.9)	19 (23.8)	61 (76.3)	0.388	1	0.596
No	726 (90.1)	196 (27.0)	530 (73.0)			

Table 2 shows the bivariate relationship between the characteristics of caregiving by respondents and depression/anxiety. Only provision of caregiving to individuals with multiple conditions ( $p = 0.011$ ), to one's

child ( $p=0.032$ ), and to a friend ( $p=0.038$ ) were statistically significantly relationship with depression or anxiety. Higher depression or anxiety rate was observed when care was given to a friend (42%) compared to non-

friends (27%) while a lower rate was found among those who give care to their child (20%) vs when the relationship was not parent to child (29%). There was no statistically significant difference in depression or

anxiety based on the number of hours spent weekly on providing caregiving and formal caregiving or provision of care as a profession.

**Table 3: Multiple Logistic Regression Model Between Participant's Characteristics, Caregiving, and Depression/Anxiety.**

Variables	B	OR	p
Provide Caregiving (Yes)	0.46	1.58	<b>0.000</b>
Age in years (continuous)	-0.02	0.98	<b>0.000</b>
Gender (Male)	-0.51	0.60	<b>0.000</b>
Ethnicity (Whites)	0.55	1.74	<b>0.000</b>
Household income (> \$50,000)	-0.57	0.57	<b>0.000</b>
Education (Bachelors or higher)	-0.13	0.88	0.131
Relationship status (Married/Partnered)	-0.27	0.76	<b>0.001</b>

Note. The goodness of fit the model was evaluated by Hosmer and Lemeshow Test;  $\chi^2 = 13.34$ ,  $df = 8$ ,  $p = 0.100$ .

In Table 3, the multiple logistic regression between depression/anxiety, provision of caregiving, and sociodemographic characteristics, only educational attainment did not statistically significantly predict depression or anxiety. The Hosmer and Lemeshow test showed that the model is a good fit ( $p > 0.05$ ). In this model, providing caregiving increases the odds of being depressed or anxious by 58% compared to not providing

caregiving and an increase in age by one year reduces the odds of depression or anxiety by 2%. Men were 40% less likely to be depressed or anxious compared to their female counterparts with the same characteristics. Also being non-Hispanic White was associated with a 74% increase in the odds of depression or anxiety compared to other ethnicities of the same age, gender, income, education, relationship, and caregiving status. Earning an annual income of more than \$50,000, attaining a bachelor's or higher degree, and being married were associated with lower likelihood of being depressed or anxious.

**Table 4: Multiple Logistic Regression Model Between Demographic and Caregiving Characteristics, and Depression/Anxiety.**

Variables	B	OR	p
Caregiving for multiple conditions	0.55	1.74	<b>0.004</b>
Caregiving to child	-0.42	0.66	0.181
Caregiving to friend	-0.20	0.82	0.729
Age in years (continuous)	-0.02	0.98	<b>0.007</b>
Gender (Male)	-0.38	0.69	0.073
Ethnicity (Whites)	0.67	1.95	<b>0.001</b>
Household income (> \$50,000)	-0.70	0.50	<b>0.001</b>
Education (Bachelors or higher)	-0.24	0.79	0.2322
Relationship status (Married/Partnered)	-0.45	0.64	<b>0.041</b>

Note. The goodness of fit the model was evaluated by Hosmer and Lemeshow Test;  $\chi^2 = 9.37$ ,  $df = 8$ ,  $p = 0.312$ .

The provision of caregiving to a person with multiple conditions, age, ethnicity, gender, relationship status were statistically significantly predictors of depression or anxiety in the multiple logistic regression (Table 4). Participants who provide care to individuals with multiple conditions have a 75% higher likelihood of suffering from depression or anxiety than those who do not. Likewise, non-Hispanic Whites were two times more likely to be depressed or anxious when compared to their non-White counterparts. Contrastingly, earning an income of more than \$50,000 lowers the likelihood of depression or anxiety by half. Additionally, being married reduces the odds of depression or anxiety by 36%.

## DISCUSSION

From the analysis and results of the data from our population study, we observed a distinct association between sociodemographic factors and depression in caregiver adults.<sup>[10,17,18]</sup> All sociodemographic predictors were statistically significant; thus, we were able to draw from the data-specific interconnections. In terms of the participants' traits or characteristics, we found many different factors might have affected caregiving. We observed that depression or anxiety was significantly lower with increasing age in caregiving considering other demographic factors were held constant (Table 3). However, bivariate analysis showed depression or anxiety to be associated with a younger mean age. This shows a complex relationship that exists between the age of caregivers and depression or anxiety. Previous studies also reported a mixed relationship, for instance, two studies demonstrated that caregivers were most likely to

be depressed when they are younger.<sup>[13,17]</sup> On the other hand, another study highlighted that family caregivers who were younger had the opposite effect and were less likely to be anxious or depressed due to increase in self-esteem.<sup>[12]</sup> Lower depression or anxiety rates with increasing age may be due to the fact that older caregivers were more likely than younger caregivers to be patients' close family. Filial piety may very well play a big role in the dynamics of caregiving in family structure and sense of obligation.<sup>[5,11]</sup>

Our finding that female gender is associated with higher odds of depression compared to the male gender was consistent with suggestions from other studies.<sup>[17]</sup> Men were also 40% less likely to be depressed or anxious than female caregivers (Table 3). This has clearly been shown in previous studies where female caregivers had a higher level of caregiving stress leading to anxiety and depression.<sup>[12,15,17,18]</sup> As expected, higher income depicted a lower depression and anxiety risk (OR = 0.57,  $p < 0.05$ ) which was similar to the reports by Chen et al and other authors.<sup>[5,12,18]</sup> Respondents who reported a higher education attainment and being married were also less likely to experience depression or anxiety. Although education was not statistically significant after considering other demographic factors (Table 3), other studies, however, have associated education with decreased likelihood of depression or anxiety and increased self-esteem.<sup>[5,12,15]</sup>

Caucasians were shown to have a high depression and/or anxiety, as White caregivers were observed to have a 74% higher likelihood of being depressed or anxious when compared to other ethnicities (OR=1.74,  $p<0.05$ ). Even though a meta-analytic study reported a somewhat contrasting result of higher rates of burden and depression among ethnic minorities due to stronger filial obligations and providing more care<sup>[11]</sup>, African-American caregivers were found to have lower rates of depression than White caregivers. This suggests the presence of other factors that may interplay with race among caregivers. Additionally, being in a cohabiting relationship was associated with lower risk of depression or anxiety (OR = 0.76,  $p<0.05$ ). We assume that being in a relationship may provide some form of comfort or emotional attachment and some obligation to provide care.

Our study further elucidate a significant positive association between the provision of caregiving and depression or anxiety. The provision of caregiving increases the odds of being depressed or anxious by 58% (Table 3), supporting evidence from other research that highlight significant stress that develops from caregiving. This stress is strongly associated with the development of anxiety and depression.<sup>[3-7, 9,12-16, 18]</sup> We investigated the relationship between caregiving characteristics such as type of medical condition cared for and the caregiver-patient relationship and the development of depression (Table 2). We found that depression or anxiety was more

likely among caregivers who cared for individuals with multiple health conditions and in a friendship relationship with the patient and less likely among those who cared for their child. Parents who care for their children had lower rates of depression or anxiety which may be due to a strong parent-child bond to care of one's child rather than an obligation.

In the regression model (Table 4), however, only caregiving for multiple health conditions predicted a higher depression or anxiety among the caregivers (OR=1.74,  $p<0.05$ ) signifying the important role that a patient's comorbidities may play in accumulated stress that leads to depression in caregivers. Despite several reports on the association between caregivers' comorbidities and depression, we found no study that examined the effect of patient's comorbidities on caregiver's depression and anxiety. Although, prior studies have shown that formal caregiving has a protective attribute to the caregiver's health due possibly to fewer hours of caregiving as well as less social isolation<sup>[5]</sup>, we found no statistically significant relationship between depression or anxiety and professional caregiving or number of hours of caregiving. Knowledge of these factors and characteristics that influence the development of depression or anxiety among caregivers might inform the design of future interventions aimed at improving the health of caregivers.

### Limitations

Despite the contribution of this study to further understand how caregiver's sociodemographic factors and patient's medical conditions are associated with depression or anxiety, this study has its limitations. First, as with other secondary data we encountered a constraint with the variables of interest. For instance, the outcome variable measured both depression and anxiety and it was impossible to assess both mental health variables separately. Second, being a cross-sectional study, we could not claim causality and it is difficult to affirm whether the outcome followed predictors in time or vice versa. However, being a population-based sample, the demography reflected the United States population. Regardless of the issues, the study adds to the literature of caregiver stress, and possible development of depression and anxiety. It also appears to be the first to further the understanding of the type of medical condition or multitude of conditions that may impact on the caregiving burden.

### CONCLUSION

For this present study, we can conclude based on our analysis of sociodemographic factors, that being female, being younger, and being White were associated with higher depression and anxiety as opposed to being married and having a cohabiting partner which lowers the risk. In addition, caring for a friend or a patient with multiple medical conditions were associated with higher rates of depression and anxiety whereas providing

caregiving to one's child was associated with lower rates. The rise in mental health illness is drastic with an obvious paucity in measures to stem the tide. Preventive measures which not only recognize the challenges of caregivers and the proactive roles they play, can be beneficial in addressing the long-term needs of caregivers. And if these preventive measures are formulated in form of a policy, they will go a long way to prevent the development of mental health illness among caregivers.

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