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## Depression and Anxiety of Care Partners During the Emergency Department Visit of Older Adults with Cognitive Impairment

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### ABSTRACT

|                     |   |
|---------------------|---|
| <b>Introduction</b> | Older adults with cognitive impairment (CI) are more likely to visit the emergency department (ED) than those without CI. They are also more likely to suffer poor outcomes after an ED visit. Family and friends who serve as care partners contribute significant time and resources to the care of these patients and may need particular attention to their emotional needs during and after the ED encounter. In this study, we examined the association between patient and care partner characteristics on care partner depression and anxiety at the time of the ED visit.  |
| <b>Methods</b>      | Baseline data from 640 patient-care partner dyads who were enrolled in a two-site randomized controlled trial at New York University Lagone Health and Indiana University. The goal of the trial was to evaluate a tailored collaborative care management program to reduce readmissions of ED patients older than 75 years with CI and reduce care partner burden. Eligible patients were ED patients aged $\geq 75$ years with CI as measured by the Mini-Cog or the proxy-reported Short Informant Questionnaire on Cognitive Decline in the Elderly and a planned discharge home. Eligible care partners were self-identified or identified by the patient. We collected patient and care partner demographics, care partner-reported patient medical and psychiatric history, daily needs of the patient, and patient-care partner relationship. We used descriptive statistics and logistic regression to identify factors associated with symptoms of depression or anxiety in care partners, as assessed by Patient Health Questionnaire (PHQ-9) and General Anxiety Disorder (GAD-7) scores, respectively. |
| <b>Results</b>      | Depression and anxiety data were available on all 640 care partners. In total, 251 (39.2%) had depression as measured by a score of $\geq 5$ on the PHQ-9 and 299 (46.7%) had anxiety based on a score $\geq 5$ on the GAD-7. Patient functional impairment (OR 1.04, 95% CI 1.01, 1.07), behavioral and psychological symptoms (OR 1.08, 95% CI 1.04, 1.13) and care partner social support (OR 0.91, CI 0.88, 0.95) were significantly associated with care partner depression. Similarly, patient functional impairment (OR 1.04, 95% CI 1.01, 1.07), behavioral and psychological symptoms (OR 1.11, 95% CI 1.07, 1.16) and care partner social support (OR 0.94, CI 0.90, 0.97) were also significantly associated with care partner anxiety as was patient race ( $p=0.041$ ).  |
| <b>Conclusion</b>   | Care partners of older adults with CI who present to the ED demonstrate depression and anxiety, but discharge from the ED represents an opportunity to focus on integration of care partners into aftercare in a well-informed, supportive fashion.   |

## INTRODUCTION

Family members and friends who provide care (hereafter called care partners) are critically important to the ongoing support of older adult patients with cognitive impairment (CI) and are vulnerable to negative physical and psychological health outcomes including anxiety and depression.<sup>1-4</sup> However, little is known about care partner anxiety and depression at the time of patient visit to the emergency department (ED).

The ED visit can represent a “sentinel event” for an older adult with CI – a harbinger of worsening function or cognition.<sup>5-7</sup> When older adults visit the ED, they often have complex medical conditions, a long ED visit, and the need for highly coordinated care upon discharge.<sup>8</sup> Given the complex physical and psychosocial needs of older adults with CI in the ED, it is important to understand factors impacting their care partners’ anxiety and depression when the patient is presenting to the ED. Understanding those factors may help providers support patients and care partners by addressing patient symptoms and tending to the unmet physical, mental and social needs of the care partners.

In this study, we analyzed the data from the Program of Intensive Support in Emergency Departments for Care Partners of Cognitively Impaired Patients (POISED) study to investigate the relationship of care partner depression and anxiety with both care partner and patient factors. POISED is a large two-site randomized clinical trial testing the impact of a collaborative care management protocol based on assessing root causes for ED admission of cognitively impaired patients, and their care partners, with the aim of reducing readmissions.<sup>9</sup> The purpose of this study is to assess the impact of dyad characteristics on care partner depression and anxiety at the time of ED encounter.

## METHODS

### *Study Design and Participants*

We used baseline assessments of all patient and care partner dyads enrolled in the POISED randomized controlled trial at New York University Lagone Health and Indiana University from March 2018-May 2021. Eligible patients included 640 ED patients aged  $\geq 75$  years with planned discharge home who screened positive for CI via the Mini-Cog or the proxy-reported Short Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE-S) randomized 1:1 to control (n=320) and intervention (n=320). Using predefined cutoff values, those who scored  $\leq 3/5$  on the Mini-Cog or  $>3.4$  on the IQCODE (for patients who could not complete the Mini-Cog) were approached for consent and enrollment along with their identified care partners. We excluded patients if they did not screen positive for CI, were younger than 75 years old, were admitted to the hospital after the ED visit, or did not consent to participation in the study. The institutional review boards (IRBs) at both sites reviewed and approved the POISED trial protocol.

### *Measurements*

We measured symptoms of care partner depression and anxiety using the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7). The PHQ-9 is a nine-item depression scale with a total score from 0 to 27, and the GAD-7 is a seven-item anxiety scale with a total score from 0 to 21. Both scales have good internal consistency and test–retest reliability, as well as convergent, construct, criterion, procedural, and factorial validity for the diagnosis of major depression disorder and generalized anxiety disorder in adults.<sup>10,11</sup> For this study, we identified depression as a score of  $\geq 5$  on the PHQ-9 and anxiety a score of  $\geq 5$  on the GAD-7. A score of  $\geq 10$  on either scale was considered moderate depression or anxiety, respectively.

Research associates with extensive experience working with older adults and their family members interviewed care partners during the emergency department visit if the care partner was present and available, or via phone within 48 hours of the ED discharge. They collected factors including comorbid conditions, mental health diagnoses, substance abuse, pre-existing diagnosis of dementia or Mild Cognitive Impairment, daily assistance requirements, and new injury, illness, or ED visits.<sup>9</sup> We also collected care partner characteristics, including education level, mean social support as measured by the MOS-5 and relationship to, cohabitation with, and frequency of contact with the patient. Additionally, we administered the Healthy Aging Brain Care (HABC) Monitor, which includes three patient symptom domains (cognitive, functional, and

behavioral/psychological symptoms), and care partner distress for each dyad.<sup>12</sup> Finally, we collected demographic information for both patient and care partner.

### Statistical Analysis

We tested the association between patient and care partner characteristics and care partner anxiety and depression using Chi-square tests for categorical variables and either two-sample T-tests or Wilcoxon Rank Sum tests for continuous variables. Tested variables with a p-value of less than 0.05 were included in a logistic regression model with care partner depression or anxiety as the binary outcome. Given observed collinearity between the HABC Monitor score and diagnosis of Alzheimer’s Disease and Mild Cognitive Impairment, we excluded these measures from all regression models. We used SAS v.9.4 for all analyses.

## RESULTS

PHQ-9 and GAD-7 scores were available on 640 care partners. Patients were more often female, White, and non-Hispanic. In total, 251 care partner (39.2%) scored  $\geq 5$  on the PHQ-9 for depression and 299 (46.7%) scored  $\geq 5$  on the GAD-7 for anxiety. No significant differences were found in care partner presence of depression or anxiety based on patient age, sex, medical history (other than psychiatric conditions), help from an in-home assistance program, or patient substance abuse history as reported by the care partner. Similarly, no differences in care partner anxiety or depression were found based on care partner age, sex, race, or education (**Table 1**). Hispanic care partners more often reported symptoms of depression and anxiety than non-Hispanic care partners as indicated by scores  $\geq 5$  on the PHQ-9 and GAD-7 (n=62, 48.8% versus n=189, 37.1% for depression and for n=70, 55.1% versus n=228, 53.0% for anxiety).

|   | No Care Partner Depression (n=389) | Care Partner Depression (n=251) | P-value | No Care Partner Anxiety (n=341) | Care Partner Anxiety (n=299) | P-value |
|---|------------------------------------|---------------------------------|---------|---------------------------------|------------------------------|---------|
| <b>Patient Characteristics</b>  |                                    |                                 |         |                                 |                              |         |
| <b>Age</b>  |                                    |                                 | 0.441   |                                 |                              | 0.232   |
| 75-79   | 94 (24.2)                          | 64 (25.5)                       |         | 91 (26.7)                       | 67 (22.4)                    |         |
| 80-84   | 91 (23.4)                          | 70 (27.9)                       |         | 75 (22.0)                       | 86 (28.8)                    |         |
| 85-89   | 108 (27.8)                         | 58 (23.1)                       |         | 91 (26.7)                       | 75 (25.1)                    |         |
| $\geq 90$   | 96 (24.7)                          | 59 (23.5)                       |         | 84 (24.6)                       | 71 (23.7)                    |         |
| <b>Sex</b>  |                                    |                                 | 0.058   |                                 |                              | 0.074   |
| Female  | 267 (68.6)                         | 154 (61.4)                      |         | 235 (68.9)                      | 186 (62.2)                   |         |
| Male  | 122 (31.4)                         | 97 (38.6)                       |         | 106 (31.1)                      | 113 (37.8)                   |         |
| <b>Race</b>   |                                    |                                 | 0.708   |                                 |                              | 0.025   |
| African American  | 71 (19.0)                          | 42 (17.5)                       |         | 73 (22.4)                       | 40 (13.9)                    |         |
| Other   | 64 (17.1)                          | 47 (19.6)                       |         | 56 (17.2)                       | 55 (19.1)                    |         |
| White   | 239 (63.9)                         | 151 (62.9)                      |         | 197 (60.4)                      | 193 (67.0)                   |         |
| <b>Ethnicity</b>  |                                    |                                 | 0.018   |                                 |                              | 0.063   |
| Hispanic  | 31 (11.1)                          | 30 (19.5)                       |         | 27 (11.3)                       | 34 (17.6)                    |         |
| Not Hispanic  | 246 (88.8)                         | 124 (80.5)                      |         | 211 (88.7)                      | 159 (82.4)                   |         |
| <b>Prior diagnosis of cognitive impairment, care partner reported</b> |                                    |                                 | 0.006   |                                 |                              | 0.003   |
| MCI   | 101 (26.0)                         | 69 (27.5)                       |         | 85 (24.9)                       | 85 (28.4)                    |         |
| ADRD  | 129 (33.2)                         | 109 (43.4)                      |         | 112 (32.8)                      | 126 (42.1)                   |         |

|   |             |             |        |             |             |        |
|---|-------------|-------------|--------|-------------|-------------|--------|
| <b>Comorbid Conditions, care partner reported</b>             |             |             |        |             |             |        |
| Hypertension  | 279 (71.7)  | 194 (77.3)  | 0.117  | 245 (71.8)  | 228 (76.2)  | 0.205  |
| Diabetes  | 107 (27.5)  | 83 (33.1)   | 0.133  | 93 (27.3)   | 97 (32.4)   | 0.153  |
| Cancer  | 123 (31.6)  | 80 (31.9)   | 0.947  | 99 (29.0)   | 104 (34.8)  | 0.119  |
| Chronic Lung Disease  | 70 (18.0)   | 48 (19.1)   | 0.719  | 59 (17.3)   | 59 (19.7)   | 0.429  |
| Coronary Artery Disease                                       | 89 (22.9)   | 61 (24.3)   | 0.678  | 81 (23.8)   | 69 (23.1)   | 0.840  |
| Congestive Heart Failure                                      | 77 (19.8)   | 56 (22.3)   | 0.485  | 64 (18.8)   | 69 (23.1)   | 0.180  |
| Stroke/TIA  | 105 (27.0)  | 75 (29.9)   | 0.471  | 93 (27.3)   | 87 (29.1)   | 0.609  |
| Arthritis   | 249 (64.0)  | 172 (68.5)  | 0.240  | 226 (66.3)  | 195 (65.2)  | 0.778  |
| Osteoporosis  | 113 (29.0)  | 89 (35.5)   | 0.089  | 106 (31.1)  | 96 (32.1)   | 0.781  |
| <b>Prior Mental Health Diagnoses, care partner reported</b>   |             |             |        |             |             |        |
| Depression  | 135 (34.7)  | 123 (49.0)  | <0.001 | 112 (32.8)  | 146 (48.9)  | <0.001 |
| PTSD  | 16 (4.1)    | 14 (5.6)    | 0.392  | 14 (4.1)    | 16 (5.4)    | 0.457  |
| Schizophrenia   | 1 (0.3)     | 5 (2.0)     | 0.026  | 1 (0.3)     | 5 (1.7)     | 0.071  |
| Bipolar Disorder  | 5 (1.3)     | 2 (0.8)     | 0.562  | 4 (1.2)     | 3 (1.0)     | 0.837  |
| Patient needs help with everyday needs, care partner reported | 324 (83.3)  | 226 (90.8)  | 0.008  | 278 (81.5)  | 272 (91.6)  | <0.001 |
| Past year, received in-home assistance                        | 128 (32.9)  | 82 (32.7)   | 0.951  | 114 (33.4)  | 96 (32.1)   | 0.722  |
| Past year, any new illnesses                                  | 175 (45.2)  | 94 (37.5)   | 0.502  | 161 (47.5)  | 108 (36.1)  | 0.004  |
| Past year, any new injuries                                   | 239 (61.6)  | 142 (56.6)  | 0.206  | 214 (62.9)  | 167 (55.8)  | 0.068  |
| Past year, been to the ED                                     | 152 (39.4)  | 76 (30.8)   | 0.028  | 124 (36.7)  | 104 (35.3)  | 0.708  |
| <b>HABC Monitor, Mean (SD)</b>                                |             |             |        |             |             |        |
| Total Score   | 24.1 (16.0) | 35.9 (15.5) | <0.001 | 22.6 (15.6) | 35.7 (15.6) | <0.001 |
| Cognition Subscale  | 6.5 (5.2)   | 9.1 (5.3)   | <0.001 | 6.2 (5.3)   | 9.0 (5.1)   | <0.001 |
| Function Subscale   | 10.3 (8.5)  | 15.4 (8.6)  | <0.001 | 9.7 (8.3)   | 15.2 (8.6)  | <0.001 |
| Behavioral & Psychological Symptoms Subscale                  | 7.3 (5.6)   | 11.4 (6.1)  | <0.001 | 6.7 (5.4)   | 11.4 (6.1)  | <0.001 |
| <b>Care partner Characteristics</b>                           |             |             |        |             |             |        |
| Mean Age (SD)   | 60.7 (12.1) | 59.6 (13.3) | 0.291  | 60.7 (12.2) | 59.8 (13.0) | 0.362  |
| <b>Sex</b>  |             |             | 0.075  |             |             | 0.270  |
| Female  | 272 (70.3)  | 196 (78.1)  |        | 241 (71.1)  | 227 (75.9)  |        |
| Male  | 114 (29.5)  | 55 (21.9)   |        | 97 (28.6)   | 72 (24.1)   |        |
| Other   | 1 (0.3)     | 0 (0.0)     |        | 1 (0.3)     | 0 (0.0)     |        |
| <b>Race</b>   |             |             | 0.222  |             |             | 0.096  |
| African American  | 74 (19.3)   | 42 (16.9)   |        | 72 (21.4)   | 44 (14.9)   |        |
| Other   | 63 (16.4)   | 54 (21.8)   |        | 58 (17.3)   | 59 (19.9)   |        |
| White   | 247 (64.3)  | 152 (61.3)  |        | 206 (61.3)  | 193 (65.2)  |        |
| <b>Ethnicity</b>  |             |             | 0.015  |             |             | 0.035  |
| Hispanic  | 65 (16.8)   | 62 (24.7)   |        | 57 (16.8)   | 70 (23.5)   |        |
| Not Hispanic  | 321 (83.2)  | 189 (75.3)  |        | 202 (83.2)  | 228 (76.5)  |        |
| <b>Education</b>  |             |             | 0.389  |             |             | 0.053  |
| Less than High School   | 12 (3.1)    | 9 (3.6)     |        | 7 (2.0)     | 14 (4.7)    |        |
| Completed High School   | 50 (12.8)   | 31 (12.4)   |        | 50 (14.7)   | 31 (10.4)   |        |

|   |             |             |        |             |             |        |
|---|-------------|-------------|--------|-------------|-------------|--------|
| Some College  | 79 (20.3)   | 62 (24.7)   |        | 67 (19.6)   | 74 (24.8)   |        |
| College Graduate  | 110 (28.3)  | 70 (27.9)   |        | 105 (30.8)  | 75 (25.1)   |        |
| Graduate Degree   | 130 (33.4)  | 69 (27.5)   |        | 105 (30.8)  | 94 (31.4)   |        |
| Other   | 8 (2.1)     | 10 (4.0)    |        | 7 (2.0)     | 11 (3.7)    |        |
| <b>Relationship to patient</b>  |             |             | 0.003  |             |             | 0.055  |
| Spouse/ Partner   | 67 (17.2)   | 55 (21.9)   |        | 62 (18.2)   | 60 (20.1)   |        |
| Child   | 257 (66.1)  | 177 (70.5)  |        | 224 (65.7)  | 210 (70.2)  |        |
| Other Relative/Friend   | 65 (16.7)   | 19 (7.6)    |        | 55 (16.1)   | 29 (9.7)    |        |
| <b>Care partner lives with the patient</b>  | 156 (40.1)  | 140 (55.8)  | <0.001 | 140 (41.1)  | 156 (52.2)  | 0.005  |
| <b>Frequency of seeing patient</b>  |             |             | <0.001 |             |             | 0.01   |
| Daily   | 194 (49.9)  | 166 (66.4)  |        | 171 (50.2)  | 189 (63.4)  |        |
| Several times a week  | 93 (23.9)   | 47 (18.8)   |        | 76 (22.3)   | 64 (21.5)   |        |
| Weekly  | 56 (14.4)   | 18 (7.2)    |        | 53 (15.5)   | 21 (7.0)    |        |
| Less than weekly  | 46 (11.8)   | 19 (7.6)    |        | 41 (12.0)   | 24 (8.0)    |        |
| <b>Social Support (MOS 5)</b>   | 76.4 (22.8) | 62.4 (27.2) | <0.001 | 76.0 (23.2) | 65.1 (26.8) | <0.001 |
| *MCI – mild cognitive impairment; ADRD – Alzheimer’s Disease and other related dementia; TIA – transient ischemic attack; HABC – healthy aging brain care |             |             |        |             |             |        |

Care partner reported data on previous patient diagnosis of depression was associated with both care partner anxiety and depression ( $p < 0.01$ ). When the patient needed help with everyday tasks, lived with the care partner, or saw the care partner daily, the care partner more often had depression or anxiety. Higher (worse) HABC Monitor scores were linearly correlated with care partner depression or anxiety symptoms ( $p < 0.01$ ). Care partners with greater social support, as demonstrated by the Medical Outcomes Study Social Support Survey (MOS-5), less often self-reported symptoms of depression or anxiety.

Patient functional impairment (OR 1.04, 95% CI 1.01, 1.07), behavioral and psychological symptoms (OR 1.08, 95% CI 1.04, 1.13) and care partner social support (OR 0.91, CI 0.88, 0.95) were significantly associated with care partner depression (**Table 2**). Similarly, patient functional impairment (OR 1.04, 95% CI 1.01, 1.07), behavioral and psychological changes (OR 1.11, 95% CI 1.07, 1.16) and care partner social support (OR 0.94, CI 0.90, 0.97) were also significantly associated with care partner anxiety. Patient race was a significant factor for anxiety ( $p = 0.041$ ).

| <b>Table 2. Logistic regression results for care partner depression and anxiety<sup>1</sup> among care partners of older adults with cognitive impairment in the emergency department</b> |                                    |                |                                 |                |
|---|------------------------------------|----------------|---------------------------------|----------------|
|   | <b>Care Partner Any Depression</b> |                | <b>Care Partner Any Anxiety</b> |                |
|   | <b>OR<sup>2</sup> (95% CI)</b>     | <b>P-value</b> | <b>OR<sup>2</sup> (95% CI)</b>  | <b>P-value</b> |
| <b>Patient Characteristics</b>  |                                    |                |                                 |                |
| <b>Race</b>   |                                    | 0.612          |                                 | 0.041          |
| Black   | 1.18 (0.70, 1.97)                  | 0.541          | 0.54 (0.32, 0.92)               | 0.022          |
| Other   | 0.81 (0.45, 1.48)                  | 0.502          | 0.65 (0.36, 1.17)               | 0.148          |
| White (reference)   | 1.00                               |                | 1.00                            |                |
| <b>Past year, any new illnesses</b>   | 0.79 (0.54, 1.17)                  | 0.243          | 0.68 (0.46, 1.00)               | 0.047          |
| <b>Past year, been to the ED</b>  | 0.91 (0.61, 1.35)                  | 0.626          | 1.42 (0.96, 2.10)               | 0.078          |
| <b>Needs help with everyday tasks</b>   | 0.86 (0.47, 1.57)                  | 0.616          | 1.07 (0.59, 1.94)               | 0.832          |
| <b>Care partner reported depression</b>   | 1.23 (0.82, 1.85)                  | 0.326          | 1.22 (0.81, 1.84)               | 0.345          |
| <b>Care partner reported psychiatric problems</b>   | 0.89 (0.58, 1.38)                  | 0.612          | 0.90 (0.58, 1.40)               | 0.647          |
| <b>HABC Monitor</b>   |                                    |                |                                 |                |
| Cognition Subscale  | 1.02 (0.98, 1.07)                  | 0.355          | 1.02 (0.98, 1.06)               | 0.388          |

|  |                   |        |                   |        |
|--|-------------------|--------|-------------------|--------|
| Function Subscale                          | 1.04 (1.01, 1.07) | 0.006  | 1.04 (1.01, 1.07) | 0.004  |
| Behavioral/Psychological Symptoms Subscale | 1.08 (1.04, 1.13) | <0.001 | 1.11 (1.07, 1.16) | <0.001 |
|  |                   |        |                   |        |
| <b>Care partner Characteristics</b>        |                   |        |                   |        |
| <b>Ethnicity</b>                           |                   |        |                   |        |
| Hispanic                                   | 1.27 (0.71, 2.29) | 0.427  | 1.04 (0.58, 1.88) | 0.886  |
| <b>Relationship to patient</b>             |                   | 0.085  |                   | 0.431  |
| Spouse/ Partner                            | 2.02 (0.91, 4.48) | 0.086  | 0.92 (0.43, 1.98) | 0.830  |
| Child                                      | 2.11 (1.09, 4.06) | 0.026  | 1.25 (0.69, 2.29) | 0.465  |
| Other relative (reference)                 | 1.00              |        | 1.00              |        |
| <b>Care partner lives with patient</b>     | 1.47 (0.81, 2.65) | 0.204  | 1.56 (0.86, 2.82) | 0.145  |
| <b>Frequency of seeing the patient</b>     |                   | 0.737  |                   | 0.102  |
| Daily                                      | 0.92 (0.41, 2.07) | 0.844  | 1.06 (0.48, 2.32) | 0.888  |
| Several times a week                       | 0.77 (0.36, 1.67) | 0.514  | 1.13 (0.54, 2.34) | 0.753  |
| Weekly                                     | 0.65 (0.27, 1.56) | 0.336  | 0.47 (0.20, 1.08) | 0.075  |
| Less than weekly                           | 1.00              |        | 1.00              |        |
| <b>Social Support</b> <sup>1</sup>         | 0.91 (0.88, 0.95) | <0.001 | 0.94 (0.90, 0.97) | 0.001  |

<sup>1</sup>Defined as  $\geq 5$  on the PHQ-9 and GAD-7  
<sup>2</sup>OR represents a 5-point change on these scales.  
HABC – healthy aging brain care

Similarly, when logistic regression was used to describe factors associated with moderate depression or anxiety, the behavioral and psychological symptoms subsale on the HABC Monitor and care partner social support (MOS 5) were most strongly associated with care partner depression and anxiety (**Table 3**).

| <b>Table 3. Logistic regression results for moderate depression and moderate anxiety<sup>1</sup> among care partners of older adults with cognitive impairment in the emergency department</b> |   |                |   |                |
|--|---|----------------|---|----------------|
|  | <b>Care Partner Moderate or Severe Depression</b> |                | <b>Care Partner Moderate or Severe Depression Anxiety</b> |                |
|  | <b>OR (95% CI)</b>                                | <b>P-value</b> | <b>OR (95% CI)</b>  | <b>P-value</b> |
| <b>Patient Characteristics</b>   |   |                |   |                |
| <b>Race</b>  |   | 0.965          |   | 0.547          |
| Black  | 0.96 (0.50, 1.83)                                 | 0.897          | 0.96 (0.51, 1.80)   | 0.904          |
| Other  | 0.91 (0.43, 1.93)                                 | 0.801          | 1.42 (0.74, 2.70)   | 0.292          |
| White (reference)  | 1.00  |                | 1.00  |                |
| <b>Past year, any new illnesses</b>  | 0.94 (0.58, 1.53)                                 | 0.811          | 0.74 (0.47, 1.16)   | 0.184          |
| <b>Past year, been to the ED</b>   | 0.83 (0.50, 1.38)                                 | 0.466          | 1.19 (0.75, 1.87)   | 0.464          |
| <b>Needs help with everyday tasks</b>  | 1.06 (0.45, 2.49)                                 | 0.886          | 1.75 (0.74, 4.16)   | 0.203          |
| <b>Depression</b>  | 1.30 (0.78, 2.17)                                 | 0.318          | 1.16 (0.73, 1.85)   | 0.538          |
| <b>Psychiatric problems</b>  | 1.06 (0.62, 1.80)                                 | 0.836          | 0.96 (0.59, 1.57)   | 0.869          |
| <b>HABC Monitor</b>  |   |                |   |                |
| Cognition Subscale   | 1.03 (0.98, 1.09)                                 | 0.269          | 1.03 (0.98, 1.08)   | 0.266          |
| Function Subscale  | 1.02 (0.98, 1.05)                                 | 0.375          | 1.03 (1.00, 1.06)   | 0.070          |
| Behavioral/Psychological Symptoms Subscale   | 1.08 (1.04, 1.13)                                 | <0.001         | 1.09 (1.04, 1.13)   | <0.001         |
|  |   |                |   |                |
| <b>Care partner Characteristics</b>  |   |                |   |                |

|  |                   |        |                   |        |
|--|-------------------|--------|-------------------|--------|
| <b>Ethnicity</b>   |                   |        |                   |        |
| Hispanic   | 0.52 (0.24, 1.13) | 0.100  | 1.22 (0.64, 2.33) | 0.538  |
| <b>Relationship to patient</b>                               |                   | 0.126  |                   | 0.727  |
| Spouse/ Partner  | 1.33 (0.47, 3.78) | 0.594  | 1.32 (0.53, 3.28) | 0.556  |
| Child  | 2.10 (0.85, 5.17) | 0.108  | 1.36 (0.64, 2.90) | 0.425  |
| Other relative (reference)                                   | 1.00              |        | 1.00              |        |
| <b>Care partner lives with patient</b>                       | 1.34 (0.66, 2.73) | 0.416  | 0.95 (0.49, 1.81) | 0.864  |
| <b>Frequency of seeing the patient</b>                       |                   | 0.728  |                   | 0.358  |
| Daily  | 1.11 (0.40, 3.10) | 0.848  | 2.65 (0.91, 7.76) | 0.076  |
| Several times a week   | 0.85 (0.31, 2.33) | 0.756  | 2.04 (0.72, 5.76) | 0.179  |
| Weekly   | 0.62 (0.19, 2.05) | 0.432  | 1.83 (0.57, 5.82) | 0.309  |
| Less than weekly   | 1.00              |        | 1.00              |        |
| <b>Social Support (MOS 5)<sup>1</sup></b>                    | 0.90 (0.86, 0.94) | <0.001 | 0.94 (0.90, 0.98) | <0.001 |
| <sup>1</sup> Defined as ≥10 on the PHQ-9 and GAD-7           |                   |        |                   |        |
| <sup>2</sup> OR represents a 5-point change on these scales. |                   |        |                   |        |
| HABC – healthy aging brain care                              |                   |        |                   |        |

## DISCUSSION

This study represents an important examination of factors associated with care partner symptoms of depression and anxiety as assessed during the patient ED visit, which may represent a precarious moment in the patient’s medical trajectory. We observed significant presence of care partner anxiety and depression when the patient was in the ED and care partner anxiety and depression were associated with patient functional impairment and behavioral and psychological changes and care partner social support.

The overall incidence of depression and anxiety noted in our data was higher than that reported in other studies. Previous investigations noted depression in 11-34% of care partners and anxiety in 24-44% of care partners,<sup>2,13</sup> as compared to our findings of 39.2% and 46.7%, respectively. It should be noted that our data is representative of only those dyads who consented to participate and may not be representative of all ED patients with CI and their care partners. However, it is unsurprising that depression and anxiety of care partners was found to be even higher in this ED population; our data highlight the overwhelming need for care partner support, particularly in the ED setting. The fact that our data were collected during the COVID-19 pandemic could also have contributed to higher than previously reported rates of depression and anxiety.<sup>14-16</sup>

In bivariate testing, we found a strong correlation between patient diagnosis of depression, dementia, or MCI and care partner symptoms of depression and anxiety. Similarly, much of the focus of the HABC-Monitor is on patient physical impairment, and changes in behaviors and symptoms, including psychiatric symptoms. Thus, an observed strong correlation between HABC monitor score and care partner depression and anxiety is not surprising. Other studies similarly demonstrated an association between care partner depression and anxiety and patient physical impairment and psychiatric and behavioral syndromes.<sup>13,17,18</sup> Intuitively, it makes sense that patient diminished physical capability and neuropsychiatric symptoms would increase the burden on the care partner, sometimes resulting in depression and anxiety. Targeting behaviors identified as problematic with specific medications and home health care workers to track and respond to those behaviors may be one way to reduce the burden to care partners. Furthermore, that approach could be used in the ED as part of a comprehensive assessment and care plan.

Interestingly, previous investigations noted worsening care partner anxiety with male sex of the patient,<sup>2</sup> female sex of care partner,<sup>2,13,19</sup> and spousal relationship of the care partner to the patient,<sup>2,19</sup> whereas this study did not share those findings. The differences in our findings could reflect which patients and care partners presented to the ED and were therefore screened for inclusion in the study. It could be that for unclear reasons, certain types of care partners were more likely to bring patients to the ED. Further investigation could focus on patient and care partner factors leading to the decision to go to the ED as opposed to engaging alternative care

options, and specifically how those changed with care partner depression and anxiety. Additionally, the other studies noted did not focus exclusively on older adults, which may account for some of the differences noted.

As with other studies, greater social support was correlated with less care partner anxiety and depression.<sup>20</sup> Our findings in this regard suggest a potential ED intervention to offer help to care partners, such as ED referral of the care partner to support groups or counseling resources. The MOS-5 used here is a brief, five question survey, that can be easily administered in the ED setting to care partners of older adults. A low score could be addressed with information about resources available to care partners or a social work consultation as well as discharge planning that would support both patients and care partners.

### **Limitations**

The main limitation of this study is that it relies on subjective care partner report of patient symptoms and medical history. Depending on the care partner relationship with the patient, the reported symptoms and history may be more or less accurate. Furthermore, because of the nature of the study we were able to only show associations, but not causation between care partner anxiety and depression scores and the factors examined.

### **CONCLUSION**

This study demonstrated significant depression and anxiety in the care partners of older adults with cognitive impairment who presented to the ED. Our data further suggest that by targeting problematic patient symptoms and offering resources suggested by the MOS-5, healthcare providers may be able to impact care partner wellbeing. Furthermore, a focus on integration of cognitive assessment into discharge planning could be a way to support care partners.

### **KEYWORDS**

Emergency department, cognitive impairment, dementia, caregivers, depression, anxiety

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### **CONFLICTS OF INTEREST**

Several measures used in this research were developed by coauthors and were used without conditions in this study.



Dr. Boustani serves as a chief Scientific Officer and co-Founder of BlueAgilis; and the Chief Health Officer of DigiCare Realized, Inc. He has equity interest in Blue Agilis, Inc; DigiCare Realized, Inc; Preferred Population Health Management LLC; and MyShift, Inc (previously known as RestUp, LLC). He serves as an advisory board member for Acadia Pharmaceuticals; Eisai, Inc; Biogen; and Genentech. These conflicts have been reviewed by Indiana University and has been appropriately managed to maintain objectivity.

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