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Caring for individuals with Dementia and CIND: Findings from the Aging, Demographics, and Memory Study

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Abstract

OBJECTIVES—To compare the characteristics and outcomes of dementia caregivers to caregivers of adults with cognitive impairment, not dementia (CIND).

DESIGN—Cross-sectional study

SETTING—In-home assessment for cognitive impairment and self-administered caregiving questionnaire.

PARTICIPANTS—169 primary family caregivers of participants in the ADAMS (Aging, Demographics, and Memory Study). ADAMS participants were age 71 or older drawn from the nationally representative Health and Retirement Study.

MEASUREMENTS—Neuropsychological testing, neurologic examination, clinical assessment and medical history were used to assign a diagnosis of normal cognition, CIND, or dementia. Caregiving measures included caregiving time, functional limitations, depressive symptoms, physical and emotional strain, caregiving rewards, caregiver health, and demographic characteristics.

RESULTS—Dementia caregivers spent approximately 9 hours/day providing care, compared to 4 hours/day among CIND caregivers ($p=0.001$). 44% of dementia caregivers exhibited depressive symptoms, compared to 26.5% of CIND caregivers ($p=0.033$). Physical and emotional strains were similar in both groups of caregivers. Regardless of the strains, nearly all caregivers reported some benefits from providing care. Emotional strain experienced by CIND caregivers was partially explained by behavioral problems ($p=0.01$) and difficulty with IADLs ($p=0.01$) in

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persons with CIND. For those with dementia, behavioral problems predicted caregiver emotional strain ($p < 0.001$) and depressive symptoms ($p = 0.01$).

CONCLUSIONS—While support services are available to dementia caregivers, CIND caregivers also expend considerable time and experience strains. The real caregiver burden of cognitive impairment in the US population may therefore be greatly underestimated if we focus exclusively on people who have reached the diagnostic threshold for dementia.

Keywords

Caregiving; mild cognitive impairment; dementia; aging

INTRODUCTION

Dementia affects a large and growing number of individuals and families in the U.S.[1,2] Informal caregivers spend significant time caring for those with dementia [3], which may allow those with dementia to remain at home longer and delay the need for nursing home care.[4] However, many dementia caregivers report higher levels of stress than caregivers of individuals without dementia [5], as well as higher levels of depression, higher demands on them as part of the caregiving experience, and stronger feelings of captivity in the caregiving role.[6,7] These adverse outcomes associated with caregiving for dementia patients may be due to feeling overloaded in the caregiving role, which in turn may compromise caregivers' own health and well-being. Feelings of overload have been shown to mediate the link between dementia and caregiver stress, as well as between dementia and caregiver health.[8]

Most of what we know about caregiving for cognitively impaired individuals pertains to individuals with dementia.[9] The majority of such studies have compared dementia caregivers to caregivers of individuals without dementia. No studies to date have specifically examined characteristics of caregivers and caregiver outcomes for those providing care to individuals with the diagnostic classification of cognitive impairment, not dementia (CIND).

CIND is cognitive impairment that does not reach the diagnostic threshold for dementia. It is important to examine caregiving issues related to those with CIND because: 1) CIND affects significantly more individuals in the United States than dementia [10]; 2) individuals with CIND may progress to dementia at a significantly higher rate (e.g., 10% – 15% per year vs. 1% – 2.5% among those who are cognitively normal [11–13]); and 3) CIND may lead to an increase in neuropsychiatric symptoms, increased disability, and decreased quality of life. [14,15]

CIND, particularly in a community-based sample, is heterogeneous in both clinical presentation and etiology. Although mild cognitive problems in those with CIND may lead to the need for some assistance or supervision on complex daily activities, by definition, individuals with CIND should not need a caregiver to assist with basic daily activities due to their cognitive impairment. However, physical and sensory limitations may add burden to the cognitively impaired individual such that they need more care than their cognitive status alone would suggest. In addition, physical and sensory limitation may directly lead to the need for assistance with more basic daily activities independent of cognitive impairment. [7,16,17]

Therefore, we conducted a study to assess caregiving in persons with CIND and dementia. We examined the amount of time spent providing care because it is an important indicator of burden. Although such studies have typically focused on active help (e.g., assistance with activities of daily living (ADLs) and/or instrumental activities of daily living (IADLs)), we also included general supervision because this is also an important role when caring for

someone with cognitive impairment. Based on more recent research suggesting that caregivers may also derive emotional and physical benefits from providing care, we also examined whether caregivers perceived any rewards from their caregiving experience. [18,19]

METHODS

We used data from the Aging, Demographics, and Memory Study (ADAMS) to study outcomes of CIND and dementia caregivers. ADAMS is a nationally representative community-based study of dementia in the United States that includes dementia and CIND caregivers.[20] The ADAMS sample was drawn from the larger Health and Retirement Study (HRS), an ongoing nationally representative cohort study of individuals born before 1954 that was designed to investigate the health, social, and economic implications of aging in the U.S. population.[20,21] (The HRS is a cooperative agreement between the National Institute on Aging and the University of Michigan. The HRS began in 1992, and has interviewed more than 30,000 individuals to date.)

To accomplish the ADAMS goal of obtaining clinical assessments on 850 individuals across the full range of cognitive ability, a stratified random sample of 1770 individuals was selected for participation in ADAMS based on a nationally representative sample of approximately 7,000 HRS respondents age 70 and older who completed either the 2000 or 2002 wave of the HRS. To achieve a sufficient number of ADAMS respondents across the full range of cognitive ability, the sample was stratified based on cognitive test scores in the HRS.[20,22] Respondents were each classified into one of five cognitive strata ranging from low to high cognition. For those who completed their own HRS interview, the HRS cognitive performance test scores were calculated using an abbreviated version of the modified Telephone Interview for Cognitive Status.[23–26] Respondents for whom their HRS interview was completed by proxy did not complete the cognitive performance tests; therefore, proxy respondent cognitive scores were classified using IQCODE scores [26,27]. The three highest cognitive strata were further stratified by age (70–79 years vs. 80 years) and sex to ensure adequate numbers in each subgroup. Additional details of the ADAMS sample design are described elsewhere.[20,22] A total of 856 individuals, 56% of the nondeceased target sample, participated in all phases of the ADAMS dementia assessment.

Assessments

A nurse and a neuropsychology technician assessed all participants at their residence for cognitive impairment. Full details of the assessment and diagnostic procedures are described elsewhere.[1,20] In brief, the following information about the participant was collected from a knowledgeable informant: chronological history of cognitive symptoms, medical history, current medications, current neuropsychiatric symptoms, measures of severity of cognitive and functional impairment, and family history of memory problems. The participant completed a battery of neuropsychological measures (which included measures of verbal and visual immediate and delayed memory, language, attention, orientation, executive function, praxis, and reading ability), a depression measure, a standardized neurologic examination, a blood pressure measurement, collection of buccal DNA samples for apolipoprotein E (*APOE*) genotyping, and a 7-minute, videotaped segment covering portions of the cognitive status and neurologic examinations. We also sought medical record releases to obtain relevant neuroimaging and laboratory results from participants' physicians. All information collected during the in-home assessment was reviewed and preliminary research diagnoses regarding cognitive status were assigned in case conferences at Duke University that were attended by the study investigators with expertise in dementia and the nurse and neuropsychology technician who conducted the assessment.

A consensus expert panel of neuropsychologists, neurologists, geropsychiatrists, and internists reviewed all information collected during the in-home assessment and assigned final diagnoses. The consensus panel reviewed each case and assigned a diagnosis in two stages, first without and then with medical records. Diagnoses were assigned within three general categories: normal cognitive function, CIND, and dementia. The consensus panel used clinical judgment to assign the final diagnosis, but the diagnoses were anchored by the following criteria. Dementia diagnosis was based on guidelines from the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition* [28], and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* [29]; diagnoses of Alzheimer disease (AD) and other types of dementia were based on currently accepted criteria.[30–33] The definition of CIND and its subtypes was based on the accumulated clinical experience of a group of researchers common to ADAMS and 3 other epidemiologic studies of dementia. [1,10,20,34–36] CIND was defined prior to ADAMS on the basis of analyses of both neuropsychological data and assessment of daily function of participants with this diagnosis in our other studies.[35,36] Criteria for CIND are: cognitively not normal but not demented, self and/or informant report of problems with cognition of daily activities, or performance on neuropsychological measures that was both below expectation and at least 1.5 SDs below published norms on any test.

Informants present at the assessment were asked to complete a questionnaire about their caregiving role. Of 549 participants with CIND or dementia, 464 individuals completed the caregiving questionnaire, for a response rate of 85%. In the present study, we only examined caregiving data from family members who indicated they were the primary caregiver for those with either cognitive impairment without dementia (CIND) or dementia. The primary caregiver endorsed a question asking whether they were the person most responsible for providing care to the care recipient. This resulted in a sample of 169 caregivers (71% were caregivers for those with dementia and 29% were caregivers for individuals with CIND). The caregiving questionnaire included questions about difficulty with ADLs and IADLs, as well as self-reported measures of depressive symptoms, physical strain, emotional strain, positive aspects of the caregiving experience, time spent providing active help (i.e., assistance with ADLs and IADLs), time spent providing supervision, and demographic characteristics.

All study procedures were approved by the Institutional Review Boards at Duke University Medical Center and the University of Michigan, and informed consent was obtained from study participants or their surrogates.

Measures

Time spent providing active help and supervision—Caregivers indicated the number of days during the preceding month that they provided active help to their family member because of his/her health or memory problem, as well as the number of hours per day that he/she usually helps. A similar set of questions was asked to ascertain the extent to which caregivers supervised family members to ensure safety, provide reassurance, or to make sure that nothing went wrong. Data are reported as number of hours per month.

Activities of daily living (ADLs) and instrumental activities of daily living (IADLs)—Caregivers reported whether his/her family member had difficulty with six ADLs: getting across a room, dressing, bathing, eating, getting out of bed, and using the toilet and five IADLs: preparing meals, grocery shopping, making telephone calls, taking medications, and managing money. We calculated scale scores for ADLs ($\alpha=.83$) and IADLs ($\alpha=.76$) by summing “Yes” responses to the items.

Depressive symptoms—Respondents reported how they felt during the past week based on five items (“depressed,” “happy,” “lonely,” “enjoyed life,” and “sad”) from the Center for Epidemiological Studies of Depression (CES-D) scale, endorsed as Yes or No. We summed the responses to create a scale score ($\alpha=.84$) ranging from 0–5; higher values indicate higher numbers of depressive symptoms.

Physical and Emotional Strain—Caregivers rated the extent to which they experienced physical strain (3 items, $\alpha=.86$) and emotional strain (3 items, $\alpha=.91$) as part of their caregiver role. These questions were taken from the Caregiver Health Effects Study.[37] Scale scores were calculated separately for physical and emotional strain by taking the mean across the three items; higher values indicate higher levels of strain.

Caregiving rewards or benefits—Caregivers answered five items developed for use in the ADAMS to indicate a variety of caregiving rewards, including feeling useful, feeling closer to the care recipient, feeling good about him/herself, feeling able to handle most problems, and feeling that the care he/she was providing prevented the care recipient from getting worse.[38,39] Scale scores were calculated by summing the number of “Yes” responses to the caregiving rewards/benefits items ($\alpha=.66$).

Caregiver Health—Caregiver health was assessed in terms of self-rated overall health using a 5-point Likert-type rating scale ranging from Poor to Excellent.

Behavior problems—We measured behavioral problems with the Neuropsychiatric Inventory (NPI), a widely used measure administered to informants to obtain information about the presence, frequency (4-point scale), and severity (3-point scale) of symptoms in 10 neuropsychiatric domains in the study participant. We calculated the total number of domains with clinically significant problems defined as frequency*severity > 4.[40–42]

Cognitive Status—Cognitive assessment measures reported in this paper are the Clinical Dementia Rating Scale (CDR)[43], the Dementia Severity Rating Scale (DSRS)[44], and the Mini-Mental State Exam (MMSE)[45]. The DSRS is completed by an informant and assesses the presence and severity of impairment in 12 cognitive and functional domains. Scores range from 0 to 54, with higher scores reflecting more impairment. The CDR scale assesses the severity of dementia; scores range from 0–5 with higher scores indicating more impairment. The CDR score is based on information collected from both the informant and the respondent. In ADAMS, the final CDR score was assigned at the initial case conferences at Duke University (described above) after all assessment information was reviewed. The MMSE is a 22-item cognitive performance test; scores range from 0 to 30 with higher scores indicating better functioning.

Demographic characteristics—Caregiver demographic characteristics, including age, gender, race, education, and marital status were obtained via self-report as part of the caregiver survey. Care recipient demographic characteristics were obtained during the ADAMS assessment.

Statistical Analysis

We compared demographic characteristics, time spent caregiving, and outcomes between groups of dementia and CIND caregivers using chi-square tests, *t*-tests and analysis of variance. We conducted secondary analyses to examine selection bias among individuals with and without caregivers using *t*-tests. We examined which ADLs and IADLs may be related to depressive symptoms and rewards among caregivers using linear regression. Our

criterion for statistical significance for all analyses was $p < 0.05$. We conducted all analyses using SAS software, version 9.2 (SAS Institute, Cary, North Carolina).

Role of the Funding Source

The National Institute on Aging had no role in the collection, management, analysis, and interpretation of the data or manuscript preparation.

RESULTS

Tables 1–2 show caregiver and care recipient characteristics, respectively. Caregivers were most often female family members of the care recipient and most likely to be the care recipient's child. Caregiver demographic characteristics were quite similar between CIND and dementia caregivers. Care recipients with dementia had higher levels of dementia severity based on the Clinical Dementia Rating (CDR; $t(167)=-7.42$, $p < 0.0001$), and showed significantly higher levels of cognitive impairment based on their MMSE scores ($t(157)=10.16$, $p < 0.0001$) compared with CIND care recipients. Care recipients with dementia had difficulty with more daily functions (ADLs, $t(167)=-3.09$, $p=0.0024$; IADLs, $t(167)=-6.72$, $p < 0.0001$) than those with CIND, and this result holds after adjusting for a previous history of heart disease, diabetes, stroke, and cancer ($F(5,159)=3.25$, $p=0.008$). Based on other information collected at the assessment, difficulty with ADLs for those with CIND was due to physical or sensory problems, not cognitive problems. Some of the difficulties with IADLs were also attributed to physical problems. However, care recipients with dementia were more likely to need help with all of the other activities, and particularly with all of the IADLs. A very high proportion of individuals with dementia had difficulty with these activities.

Table 3 shows caregiving outcomes. Approximately the same proportion of dementia vs. CIND caregivers performed active help for care recipients, but caregivers of those with dementia reported spending more hours per month providing active help compared to CIND caregivers ($t(139)=-3.01$, $p=.003$). Dementia caregivers spent approximately 9 hours/day providing care, compared to 4 hours/day among CIND caregivers ($p=0.001$). Dementia caregivers were more likely to report having depressive symptoms ($\chi^2(1)=4.55$, $p=0.033$) than CIND caregivers, although there were no statistically significant differences with regard to physical strain, or positive caregiving perceptions. Table 4 presents results from multiple regression analyses performed to understand the extent to which care recipients' difficulty with ADLs/IADLs, cognitive status, and behavioral problems were related to caregivers' time spent caregiving, emotional strain, and depressive symptoms. For those with CIND, behavioral problems and IADL difficulties predicted emotional strain in their caregivers ($p=0.01$, both). For those with dementia, behavioral problems predicted caregiver emotional strain ($p<0.001$) and depressive symptoms ($p=0.01$).

We also examined which ADLs and IADLs may be related to depressive symptoms and rewards among caregivers. Using linear regression models incorporating ADLs and IADLs as predictors of depressive symptoms and rewards, respectively, we found that providing care for someone who needs help with toileting was associated with lower feelings of rewards ($\beta=-.200$, $p=0.017$) and higher levels of depressive symptoms ($\beta=.244$, $p=.025$). Caring for someone who needs help managing money was associated with higher levels of rewards ($\beta=.231$, $p=.018$), and caring for someone who needs help with taking medications was related to lower levels of depressive symptoms ($\beta=-.243$, $p=.023$).

We also examined whether there may be a selection bias based on those who indicated they were a caregiver compared to individuals who did not report they were a caregiver or for whom no one completed the informant questionnaire, using data from the HRS prior to the

ADAMS assessment. Results indicated that among demented individuals, there was no significant difference in ADLs or IADLs based on whether there was a caregiver. Among those with CIND, individuals with a caregiver had more difficulty with IADLs than individuals who did not have a caregiver or for whom no one completed the informant questionnaire ($t(239) = -2.52, p = .012$).

DISCUSSION

We conducted the present study to compare caregiver characteristics and outcomes between family caregivers of individuals with CIND and dementia. The ADAMS data used for this study are unique because they permit the examination of caregiving for individuals with dementia, as well as for nondemented individuals who are cognitively impaired. A minority of the participants with CIND had someone meeting our definition of caregiver, but a fairly high proportion of these individuals had difficulty with some basic ADLs. Even though these difficulties were due to non-cognitive problems, they contributed to the surprising finding that primary caregivers of individuals with CIND also spend considerable amounts of time caring for their family members. CIND caregivers are experiencing many of the burdens of caregiving known to be challenges for dementia caregivers. Care recipients' behavioral and neuropsychiatric problems and difficulty with IADLs seems to explain why both CIND and dementia caregivers experience emotional strain. The finding that dementia caregivers were more likely to report depressive symptoms seems related to care recipients' behavioral and neuropsychiatric problems. The person with CIND may seem more like his/her typical self whereas the person with dementia may seem like a different person. Our findings are generally consistent with prior research on strains associated with caregiving. [46,47]

In addition to examining caregiving burden, we also assessed caregiving rewards. Almost all caregivers for both groups reported some rewards from their caregiving experience, viewing oneself as more efficacious in a number of ways, such as feeling closer to the care recipient and/or feeling in control over the recipient's well-being. This extends prior research that has also shown that caregivers may experience benefits rather than just strains. [38,39,48]

Implications

For individuals with CIND who require assistance, caregivers may be struggling with many challenges that are well-known as issues for dementia caregivers, and therefore appropriate resources should be recommended and made available to CIND caregivers. CIND caregivers provide a great deal of informal assistance to older family members and should be afforded services and supports available to dementia caregivers (if they are not already). Medicare and other paid help services may not be available without a dementia diagnosis. A more comprehensive service system would be of benefit to both dementia and CIND patients and their caregivers. Among those with CIND that convert to dementia, there is a period of caregiving expense and strain prior to the diagnosis of dementia. Some individuals with CIND may have marked medical and physical problems that demand medical attention, and the cognitive problems of individuals with CIND may be overshadowed by these other health conditions. However, this subset of individuals with CIND may require additional assistance to manage their health conditions and to do some daily activities due both to physical problems and mild cognitive problems.

The real societal cost of cognitive impairment and dementia may be greatly underestimated if estimates of caregiver burden are limited to care recipients who have reached the diagnostic threshold for dementia. Supporting CIND caregivers may reduce burdens of caregiving, sustain their ability to provide care, and prevent or postpone institutional placement of their impaired family member.

This study also has some limitations worth noting. The cross-sectional design warrants caution when interpreting cause/effect relationships. Another limitation is the relatively small sample size of CIND caregivers. Not all participants with CIND needed assistance from a caregiver and therefore those with CIND in the present study may exhibit more cognitive or physical limitations. Inferences from these results should not be directed at all individuals with CIND but rather to those with CIND who require caregiving. Lastly, the time estimates provided by caregivers may reflect the caregiver's feelings of distress and not the precise amount of time spent performing the task.

In sum, this study highlights important issues that should be considered when treating patients with CIND and referring family caregivers for resources. Our study reveals high levels of caregiver burden associated with CIND, which is more common than dementia in the US. It is therefore possible that the caregiver burden associated with cognitive impairment is far higher than previously assumed and caregiver supports should not be limited to caregivers of those with a dementia diagnosis.

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Table 1

Family Caregiver Characteristics

| | Combined | Dementia | CIND | Comparison |
|--------------------------------|--------------------|--------------------|--------------------|------------|
| N | n=169 | n=120 | n=49 | p-value |
| Age | 60.4 (\pm 14.1) | 60.1 (\pm 14.4) | 61.3 (\pm 13.4) | .62 |
| Female Sex | 73.7% | 70.6% | 81.3% | .16 |
| Race | | | | .67 |
| Non-Hispanic White | 67.1% | 65.6% | 70.8% | |
| Non-Hispanic Black | 21.6% | 21.9% | 20.8% | |
| Hispanic | 10.2% | 11.8% | 6.3% | |
| Education | | | | .94 |
| < 12 years | 17.3% | 16.7% | 18.8% | |
| 12 years | 36.9% | 37.5% | 35.4% | |
| > 12 years | 45.8% | 45.8% | 45.8% | |
| Married | 70.2% | 70.0% | 70.8% | .92 |
| Relationship to Care Recipient | | | | .45 |
| Spouse | 26.0% | 23.3% | 32.7% | |
| Child | 53.3% | 55.0% | 49.0% | |
| Other Family Member | 20.7% | 21.7% | 18.4% | |
| Live with Care Recipient | 62.5% | 60.8% | 66.7% | .48 |

CIND refers to Cognitive Impairment, Not Dementia

Table 2

Care Recipient Characteristics

| | Combined | Dementia | CIND | Comparison |
|----------------------------|-------------------|-------------------|-------------------|------------|
| N | n=169 | n=120 | n=49 | p-value |
| Age | 83.7 (\pm 4.5) | 84.5 (\pm 3.7) | 83.0 (\pm 6.0) | .13 |
| Sex | 76.4% | 71.4% | 74.7% | .75 |
| Race | | | | .67 |
| Non-Hispanic White | 82.0% | 78.1% | 85.8% | |
| Non-Hispanic Black | 11.7% | 14.1% | 9.4% | |
| Hispanic | 6.3% | 7.9% | 4.8% | |
| Education | | | | .32 |
| < 12 years | 49.1% | 54.4% | 43.9% | |
| 12 years | 30.5% | 32.1% | 28.9% | |
| > 12 years | 20.5% | 13.5% | 27.2% | |
| Married | 29.3% | 29.9% | 28.6% | .91 |
| DSRS | 16.0 (\pm 8.5) | 22.9 (\pm 7.9) | 9.3 (\pm 4.8) | <.001 |
| CDR | 1.2 (\pm 0.8) | 1.8 (\pm 0.8) | 0.5 (\pm 0.2) | <.001 |
| MMSE | 21.0 (\pm 4.6) | 15.4 (\pm 3.2) | 25.5 (\pm 3.0) | <.001 |
| Functional Limitations | | | | |
| ADLs | 2.9 (\pm 1.4) | 3.3 (\pm 1.2) | 2.5 (\pm 1.8) | .01 |
| IADLs | 3.1 (\pm 1.1) | 3.9 (\pm 0.9) | 2.4 (\pm 1.3) | <.001 |
| Neuropsychiatric Symptoms* | 34.0% | 30.3% | 37.5% | .46 |

CIND refers to Cognitive Impairment, Not Dementia. DSRS is the Dementia Severity Rating Scale. CDR is the Clinical Dementia Rating. MMSE is the Mini-Mental State Exam. ADLs are Activities of Daily Living and IADLs are Instrumental Activities of Daily Living.

* Percentage with at least one clinically significant neuropsychiatric symptom.

Table 3

Descriptive Statistics: Caregiving Types and Outcomes

| | Combined | Dementia | CIND | Comparison |
|-----------------------------------|-----------------|-----------------|-----------------|------------|
| | n=169 | n=120 | n=49 | p-value |
| Active Help – % | 90.6% | 89.2% | 93.9% | .34 |
| Active Help – Number of Hours | 236.5 (±267.2) | 278.7 (± 285.3) | 133.7 (± 181.9) | .001 |
| Supervision – % | 82.3% | 85.8% | 73.5% | .06 |
| Supervision – Number of Hours | 291.3 (± 279.1) | 309.9 (± 283.4) | 231.5 (± 260.5) | .20 |
| Physical Strain – % Reporting | 65.5% | 69.1% | 57.9% | .23 |
| Physical Strain | 1.6 (± 0.6) | 1.7 (±0.6) | 1.6 (±0.6) | .32 |
| Emotional Strain – % Reporting | 70.8% | 73.6% | 64.1% | .27 |
| Emotional Strain | 1.8 (±0. 7) | 1.9 (± 0.7) | 1.6 (± 0.6) | .06 |
| Depressive Symptoms – % Reporting | 39.1% | 44.2% | 26.5% | .03 |
| Depressive Symptoms | 1.0 (± 1.5) | 1.1 (± 1.6) | 0.8 (± 1.5) | .21 |
| Caregiving Rewards – % Reporting | 98.8% | 98.3% | 100.0% | .36 |
| Caregiving Rewards | 4.1 (±1.2) | 4.1 (± 1.2) | 4.1 (± 1.1) | .92 |
| Caregiver Health | 3.2 (± 1.1) | 3.3 (±1.1) | 3.1 (± 1.2) | .42 |

CIND refers to Cognitive Impairment, Not Dementia

Table 4

Multiple Linear Regression Analysis of Care Recipient's Difficulty with ADL and IADLs, Cognitive Status, and Behavioral Problems on Caregiver Outcomes

| Outcome | Predictor | Dementia | | | CIND | | |
|-------------------------------|-----------|----------|------|---------|----------|-------|---------|
| | | Estimate | S.E. | p-value | Estimate | S.E. | p-value |
| Active Help – Number of Hours | ADLs | -0.2 | 14.8 | 0.98 | 1.8 | 16.6 | .91 |
| | IADLs | 13.3 | 23.0 | 0.56 | 38.5 | 21.9 | .08 |
| | CDR | 59.0 | 27.1 | 0.03 | 36.5 | 151.7 | .81 |
| Emotional Strain | NPI | 32.2 | 20.3 | 0.11 | 8.2 | 35.3 | .81 |
| | ADLs | 0.06 | 0.04 | 0.09 | 0.0 | 0.1 | 0.97 |
| | IADLs | 0.09 | 0.05 | 0.09 | 0.2 | 0.1 | 0.01 |
| Depressive Symptoms | CDR | -0.08 | 0.06 | 0.17 | -0.3 | 0.42 | 0.43 |
| | NPI | 0.20 | 0.05 | <.001 | 0.3 | 0.1 | 0.01 |
| | ADLs | 0.06 | 0.07 | 0.36 | -0.09 | 0.13 | 0.49 |
| | IADLs | 0.06 | 0.11 | 0.56 | 0.12 | 0.17 | 0.48 |
| | CDR | -0.04 | 0.14 | 0.75 | -2.17 | 1.22 | 0.08 |
| | NPI | 0.31 | 0.10 | <.01 | 0.51 | 0.28 | 0.08 |

CIND refers to Cognitive Impairment, Not Dementia. ADLs are Activities of Daily Living and IADLs are Instrumental Activities of Daily Living. CDR is the Clinical Dementia Rating. NPI is the Neuropsychiatric Inventory; scores are based on the total number of clinically significant behavioral problems/neuropsychiatric symptoms. S.E. = Standard Error