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Title
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Permalink
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Journal
Journal of Aging and Health, 34(6-8)

ISSN
0898-2643

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Publication Date
2022-10-01

DOI
10.1177/08982643221085106

Peer reviewed

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HHS Public Access
Author manuscript
J Aging Health. Author manuscript; available in PMC 2022 December 14.

Published in final edited form as:
J Aging Health. 2022 October ; 34(6-8): 1005–1015. doi:10.1177/08982643221085106.

Neighborhood Characteristics and Caregiver Depressive Symptoms in the National Study of Caregiving (NSOC)

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Abstract

Objectives: We examined the association between neighborhood characteristics and depressive symptoms in a population-based sample of dementia caregivers.

Methods: Data came from the 2017 National Health and Aging Trends Study (NHATS) and National Study of Caregiving (NSOC). The sample included 956 caregivers of those with dementia. Linear regression was used to examine associations between neighborhood physical disorder (NPD), neighborhood social cohesion, and depressive symptoms, and to test the moderating effect of social support on these relations.

Results: Results suggested that having friends and family (1) to talk to buffered the effect of high NPD and low cohesion on depressive symptoms, (2) to help with daily activities buffered the effect of low cohesion on depressive symptoms, and finally, (3) to help with care had a protective effect on depressive symptoms if social cohesion was high.

Discussion: Neighborhood contextual characteristics and social support interact to affect caregiver depressive symptoms in complex ways.

Keywords

Informal caregivers; social determinants of health; depression

The older population in the U.S. is growing rapidly and accompanying this dramatic growth is the number of family and unpaid caregivers of those with dementia or Alzheimer's disease (Roberts et al., 2018). While caregiving may be associated with positive rewards and feelings of satisfaction, caregiving challenges may place caregivers at risk for significant health problems (Cheng, 2017; Yaffe et al., 2002). Further, research indicates that caregivers are less likely to engage in preventive health behaviors (Schulz et al., 1997), which is problematic given that research also suggests caregiving is associated with decrements in

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Declaration of Conflicting Interests: The authors declare that there is no conflict of interest.

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immunity measures (Roth et al., 2019), greater cardiovascular reactivity, and slower wound healing (Kiecolt-Glaser et al., 1995). Caring for an adult with a chronic condition like dementia contributes to psychiatric morbidity in the form of higher prevalence and incidence of depressive and anxiety disorders (Salim et al., 2015; Schulz et al., 1997). Caregivers of people with dementia often have greater emotional and physical burden compared to caregivers of older adults who have other health conditions (Family Caregiver Alliance, 2016). Hence, caregiving has become a public health issue and will become increasingly prominent with the aging of the baby boomer generation (Talley & Crews, 2007).

Much of the research on dementia caregiving centers on individual- and family-level factors associated with stress; fewer studies are focused on the neighborhoods in which caregiving takes place or the social context of caregiving (Beach, Kinnee, & Schulz, 2019), which can be strongly impact caregivers (Rote et al., 2017). Additionally, social determinants of health do not discriminate caregivers from non-caregivers; that is, contextual factors such as neighborhoods affect both caregivers and non-caregivers alike. Ecological-contextual theories of caregiving suggest that neighbors and the surrounding context can be important sources of support for caregivers (Aneshensel et al., 2007; Cagney et al., 2013). When the surrounding environment is stressful, this can exacerbate the stress of dementia caregiving.

Communities with high levels of crime and lack of community resources (e.g., community centers, libraries) can contribute to poor health and mental health for caregivers. Brummett and collgeagues (2005) found that among those living in neighborhoods with high levels of crime, compared to non-caregivers, dementia caregivers had higher levels of fasting plasma glucose and hemoglobin A1c, the underlying mechanism responsible for diabetes and associated with increased mortality (Pan et al., 1986). Specifically, neighborhood physical disorder (e.g., graffiti, litter/garbage, number of vacant homes) can limit older adults' participation in various activities such as walking (Clarke et al., 2011; Latham & Clarke, 2018). Neighborhood physical disorder is related to fears of victimization which may limit caregivers' desire to leave the house for support, or go to the care recipient's home to provide support (Lorenc et al., 2012). Further, perceptions that one is unsafe in a neighborhood may result in psychological distress, both directly and indirectly, through a reduced sense of control and increased sense of helplessness (Hill & Angel, 2005; Ross & Jang, 2000) which may intensify caregiver stress. Deficits in the built environment- including inadequate sidewalks and transportation -may lead to greater stress for caregivers and dissuade them from wanting to be outside with their loved ones (Mendes de Leon et al., 2009) while safe sidewalks or greenspace may be positively associated with well-being (van den Berg et al., 2015).

Neighborhood social cohesion is characterized by the presence of trusting relationships among individuals who may not otherwise have close emotional ties (Sampson et al., 1997). Living in a community where neighbors trust each other has been hypothesized to support "loose" interpersonal connections that have many positive structural benefits (Putnam, 2000), including better access to social and health services (Hendryx & Ahern, 2001; Matsaganis & Wilkin, 2015). That is, the presence of loose ties in the neighborhood might facilitate knowledge about and access to healthcare and support for caregivers. Theories around collective efficacy and social disorganization provide mechanisms for how

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neighborhood characteristics influence health. Because collective efficacy captures norms and expectations, neighborhood social cohesion is thought to contribute to older adults' health by reinforcing health-related behaviors, including leaving the home and acting as a buffer against stressful situations (Cagney et al., 2009).

Although neighborhood features may contribute to greater anxiety, stress, and depression for caregivers, social support may offset some of these negative consequences. Cohen (2004) posited that a positive relationship between social support and psychological well-being provides a buffer against burden and stress for caregivers by increasing the perception that resources are readily available. Social support is an interpersonal transaction and can be conceptualized in many ways, including network size and frequency of contact, support received and frequency of help from others, and general satisfaction with one's support network (Wills & Shinar, 2000). Different types of support- instrumental (e.g. tangible support), emotional (e.g. empathy or encouragement from others), or informational (e.g. advice or guidance)- can lead to different outcomes (Gottlieb & Bergen, 2010). For example, Leggett and colleagues (2021) found that having friends and family to talk to was linked to greater caregiving gains over and above other types of support (e.g., help around the house). Similarly, Halpern et al. (2017) also showed that different types of support was associated with differing outcomes for cancer caregivers.

To our knowledge, no study to date has examined the role of neighborhood physical disorder and social cohesion on dementia caregiver mental health using a large, nationally representative sample of caregivers. In the current study, we examine features of the neighborhood that seldomly have been examined in caregiver studies as well as how the social context may buffer against the stress of dementia caregiving. Our conceptual framework is guided by the literature on the social determinants of health as well as by the sociocultural stress and coping model (Knight & Sayegh, 2010) which highlights the impact of caregiving and sociocultural variables on caregiver health outcomes. It incorporates not only individual differences, but also protective resources, such as social support, as potential buffers against stressors. We hypothesize that neighborhood characteristics, including physical disorder and social cohesion, will be associated with caregiver depressive symptoms (Figure 1). Moreover, we hypothesize that the presence of different types of social support provides a buffer against the impact of deleterious neighborhood characteristics, including high physical disorder and low social cohesion.

Methods

Data Sources

Data were drawn from the 2017 National Study of Caregiving (NSOC) and National Health and Aging Trends Study (NHATS). NHATS is a nationally representative sample of Medicare beneficiaries 65 years of age and older that has been conducted yearly since 2011. During the NHATS in-person interview, participants were asked if an unpaid family member or non-family helper provided assistance with household chores, mobility, or self-care tasks. If yes, NHATS participants gave names of individuals who helped with such tasks. If more than five names were listed, five were randomly selected for inclusion in NSOC.

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Analytic Sample

As we sought to examine the relationship between neighborhood disorder and cohesion with depressive symptoms among caregivers of persons living with dementia, we selected caregivers of NHATS participants with probable or possible dementia. Classification of probable or possible dementia was based on report of a diagnosis, scores on the Ascertain Dementia 8 (AD8) questionnaire, and performance on other tests as described by Kasper and colleagues (2013a). Further, because neighborhood disorder was only reported for NHATS sample persons, we subset to caregivers who shared the same neighborhood as the person living with dementia, defined as living within 5 minutes of the person they were caring for. IRB approval was not needed as NSOC and NHATS data are publicly available datasets with no known identifiers.

Measures

Outcome.—Depressive symptoms were assessed via the Patient Health Questionnaire–2 (PHQ-2), which asked respondents how often in the past month they "had little interest or pleasure in doing things" and "felt down, depressed, or hopeless." Each item was assessed on a 4-point scale (*0=not at all, 1=several days, 2=more than half the days, 3=nearly every day*). Depressive symptoms were computed as the average of the two items (range=0–3); a higher mean score indicated greater level of depressive symptoms.

Neighborhood Characteristics.—Neighborhood physical disorder was derived from an environmental checklist completed by the NHATS interviewer prior to the in-person interview with the NHATS participant. Interviewers were asked, "When standing in front of the [respondent/sample participant]'s home/building, and looking around in every direction, how much of the following did you see?" The interviewer rated (*0 = none, 1 = a little, 2 = some, and 3 = a lot*) for the amount of: litter/trash on sidewalks, graffiti on walls, and number of vacant homes or stores in the area around the respondent's residence. The average value across the measures of physical disorder was computed (range = 0–3), with higher scores representing more neighborhood disorder. Social cohesion was assessed based on NHATS study participants' responses to three questions about their residential community: (a) people know each other well, (b) people are willing to help each other, and (c) people can be trusted; each answered on a 3-point scale (*0= do not agree, 1= agree a little, 2= agree a lot*). Items were averaged to create a total scale score; higher values indicated greater cohesion and more positive perceptions of community support. Both measures of neighborhood context are based on previously validated research and are commonly used in the literature (Cagney et al., 2009; Kasper & Freedman, 2014). Moreover, both measures provided varying perceptions of the neighborhood environment.

Social support.—We examined three measures of caregiver support: (a) having friends or family to talk to about important things in life, (b) having friends or family to help with daily activities such as running errands, and (c) having friends or family to help with care provision for the person with dementia (Freedman et al., 2019). All responses indicated whether or not the caregiver received the support [*yes* (1) or *no* (0)]. Given the strong positive relationships between measures of social support (i.e., Cramer's V ranged from 0.24–0.40; Akoglu, 2018); and in line with previous research utilizing NSOC social support

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measures (Leggett et al., 2021, Halpern et al., 2017), each measure of social support was examined separately in its own regression model.

Covariates.—We derived caregiver sex, age in years, education (less than high school, high school, some college or greater), relation to the care participant (spouse, adult child, other) and race (White, Black, Other). Caregivers' provision of activities of daily living (ADL) and mobility support and instrumental activities of daily living (IADL) support were also computed. Caregivers provided ADL and mobility support for up to 7 activities including eating, bathing, toileting, dressing, mobility outside, mobility inside, and help in and out of bed (summed score: range 0–7). Caregivers provided IADL support for up to 5 activities including laundry, shopping, meals, finances, and medications (summed score: range 0–5).

Statistical Analysis

Caregivers included in our study were characterized using descriptive statistics. Next, the relationship between depressive symptoms, neighborhood characteristics (i.e., disorder, cohesion), and social support was examined using linear regression. As mentioned above, we ran three separate regression models, each including just one of the support variables. To further explore if social support moderated the relationship between depressive symptoms and neighborhood disorder and depressive symptoms and social cohesion, interaction terms between neighborhood disorder and support, and social cohesion and support were tested in subsequent models. All models adjusted for the above mentioned covariates.

All analyses accounted for the complex survey design and used NSOC weights that account for differential probabilities of survey design and sample selection (Kasper et al., 2013b). We accounted for clustering of multiple caregivers for the same care recipient and Taylor series linearization was used to compute standard errors (Freedman et al., 2020; Heeringa et al., 2017). We adjusted for selecting caregivers living within 5 minutes of the person they were caring for by computing selection weights and multiplying these by the survey weights. Specifically, using all caregivers of persons with dementia, we fit a weighted logistic regression model where the outcome was living within 5 minutes of the care participant or not (1; 0 otherwise), adjusting for age, sex, education, relationship to person they were caring for, duration of caregiving, ADLs, and IADLs. The inverse of the predicted probability of living within 5 minutes from the weighted logistic regression model (i.e., selection weight) was then multiplied by the survey weight, resulting in a new weight; this weight was used in the analyses. Alpha was set at 0.05 and all tests were two-sided.

Results

Of 2,652 caregivers (unweighted) who participated in NSOC in 2017, 1,525 were excluded due to not providing care for an individual with probable or possible dementia and 171 were excluded due to missing data, resulting in 956 caregivers of persons with probable or possible dementia who had complete data on all study variables. There was an average of 1.61 caregivers per care recipient (quantile distribution: Q1=1, Q3=2; range=1–5; thus, 75% of the sample persons included had 2 or fewer caregivers) in this study. Subsequent results are based on weighted estimates.

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Sample Characteristics

Among caregivers of older adults with dementia, the average age was 59.1 years and 68.1% were female (Table 1). Almost 67.4% were White and 17% were Black. The majority had at least a high school education (89.3%) and were adult child caregivers (55.1%). On average, caregivers helped the person with dementia for 6.8 years and with 1.1 ADLs. Among caregivers of interest, neighborhood disorder on average was 0.09, and social cohesion, on average was 1.3, suggesting that the presence of neighborhood physical disorder was quite low and social cohesion was high. The majority of caregivers had friends or family to talk to (80.7%) and help with caring for their person (78.3%); more than half had friends and family to help with daily activities (56.8%). Further, caregivers had an average PHQ-2 score of 0.6 (95% confidence interval: 0.3, 0.9), indicating low depressive symptoms.

Associations of Caregiver Depressive Symptoms with Neighborhood Disorder, Social Cohesion, and Social Support

Below, we first summarize results from models without interactions (“main effects models”) and then summarize the results of the models with interactions for each social support variable separately (presented in Tables 2 and 3, respectively). Figure 2 displays the significant interactions.

Having friends and family to talk to.—Results of the main effects model (Table 2) indicated that both social cohesion (B = −0.22; 95% confidence interval [CI]: −0.35, −0.09) and having friends and family to talk to (B = −0.62; 95% CI:−0.96, −0.28) were negatively associated with depressive symptoms while neighborhood disorder was not (B = 0.16; 95% CI: −0.02, 0.33). In the model with interactions, we found both interactions to be significant (Table 3, column 1). Specifically, results suggested that having friends and family to talk to buffered the effect of neighborhood disorder (B= −0.79; 95% CI: −1.44, −0.15) and in neighborhoods with low social cohesion, having friends and family to talk to was associated with lower levels of depressive symptoms (B = 0.51; 95% CI: 0.16, 0.86).

Having friends and family to help with daily activities.—In the main effects model, both social cohesion (B = −0.32; 95% CI: −0.53, −0.11) and having friends and family to help with daily activities (B = −0.22; 95% CI: −0.44, −0.001) were negatively associated with depressive symptoms, while neighborhood disorder was not (B = 0.14; 95% CI: −0.08, 0.37). In the model with interactions (Table 3, column 2), we found the interaction between social cohesion and friends and family to help with daily activities to be significant- in neighborhoods with low social cohesion, having friends and family to help with daily activities was associated with reduced depressive symptoms (B = 0.44; 95% CI: 0.07, 0.80).

Having friends and family to help with care.—In the main effects model, social cohesion was negatively associated with depressive symptoms (B = −0.35; 95% CI: −0.60, −0.10) while neighborhood disorder and having friends and family to help with care were not (B = 0.05; 95% CI: −0.17, 0.28). However, both interactions were significant (Table 3, column 3): having friends and family to help with care had a protective effect on depressive symptoms as social cohesion increased (B = −0.38; 95% CI:−0.72, −0.04), and having

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friends and family to help with care buffered the negative effect of neighborhood disorder ($B = -1.03$; 95% CI: −1.52, −0.55).

Discussion

Although previous research has indicated a link between neighborhoods and health, there is a paucity of research surrounding neighborhoods and health among caregivers of older adults with dementia (for a review, see Blair et al., 2014). Dementia caregiving presents a variety of stressors that make caregivers vulnerable to a host of poor mental health outcomes. Features of the neighborhood can further contribute to stress for caregivers, so it is important to examine how supportive interventions can target these vulnerable places and people. Results from the present study suggest that neighborhood characteristics, particularly social cohesion, may play an important role in caregiver depressive symptoms. We did not find that neighborhood physical disorder was associated with caregiver depressive symptoms. Findings also suggested that social support- namely having friends and family to talk to and help with daily activities was associated with lower level of depressive symptoms.

In this study, greater neighborhood cohesion was associated with lower level of depressive symptoms for caregivers. Similarly, using NSOC data, Moon and colleagues found that a sense of community reported by care recipients (not specific to just dementia) protected against caregiver depressive symptoms (Moon et al., 2017). A study in Greece showed that lower social cohesion and fewer connections with neighbors was associated with greater caregiver burden for dementia caregivers (Papastavrou et al., 2015). Caregivers who live in neighborhoods where there is a strong sense of cohesion may be more likely to share information with neighbors and provide each other with community-level support. This level of support may be even more critical for caregivers of those with dementia that exhibit wandering behaviors. In these situations, having neighbors that caregivers can trust and depend on is absolutely necessary.

In contrast to the finding on social cohesion, there was no main effect of neighborhood disorder on caregiver depressive symptoms, supporting findings from Stahl and colleagues (2017) showing no relation between neighborhoods and depressive symptoms. That is, physical disorder such as graffiti and trash on sidewalks does not appear to be associated with greater level of depressive symptoms. This was somewhat surprising and differs from other research showing that neighborhood disorder is associated with psychological distress (Aneshensel & Sucoff, 1996; Mair et al., 2008; Ross, 2000; Ross et al., 2000). However, the difference between our studies and much of the extant literature on neighborhood disorder and depression was our specific focus on dementia caregivers. Dementia caregiving may be so all encompassing that physical disorder in the neighborhood may not be salient enough to influence caregiver mental health. In contrast, social cohesion may be more important because it indicates a connection to one’s neighbors, who may be able to provide social support and buffer against caregiver stress and depression.

We also found that social support, specifically- having friends and family to talk to and help with daily activities was associated with lower level of depressive symptoms. Interestingly,

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having friends and family to help with care was not associated with depressive symptoms. It could be that caregivers who require that family and friends be involved with caregiving have greater burden and stress that subsequently necessitates help with care. Although we controlled for the person's functioning (ADLs and IADLs), we did not have a measure of dementia severity, which may have helped to explain the finding.

Findings indicated that having certain types of support interacted with neighborhood disorder and social cohesion. Having friends and family to talk to and help with daily activities buffered against the negative impact of neighborhood disorder and low social cohesion on caregiver depressive symptoms. This has been shown in other studies. Kim & Ross (2009) found that the effect of neighborhood disorder on depression was less pronounced among participants with high levels of social support. Similarly, Dawson and colleagues (2019) found that people who lived in neighborhoods with structural disadvantage but higher levels of neighborhood social cohesion reported fewer depressive symptoms. However, we found that having friends and family to help with care was associated with lower level of depressive symptoms, but only if social cohesion was high. This suggests that having friends and family to help with care doesn't necessarily buffer against low social cohesion, but there does seem to be an important aspect of having both social support and social cohesion, with the result being lower level of depressive symptoms. However, more research is needed to understand why having friends and family to help with care was protective only when caregivers perceived high neighborhood cohesion.

This study had limitations. The definition of neighborhood was subjective. That is, neighborhoods and the perception of who is one's neighbor varies from individual to individual. "Neighbors" may mean those on one's immediate street, or those within a 1-mile radius. Moreover, we assumed that the caregiver's neighborhood disorder would be the same as the person they were caring for if they lived within 5 minutes. This is a somewhat arbitrary definition and there may be significant variation in physical disorder within the 5-minute radius. However, this is less of a concern given that as the caregiver, they may spend quite a bit of time at the home of the person they are caring for, and thus are still being exposed to the physical disorder that is present. We believe that disorder in either neighborhood (caregiver or person with dementia) is likely to affect caregiver depressive symptoms (Moore et al., 2013). Also, given the cross-sectional nature of our study, we cannot assume causality, i.e., that neighborhood disorder causes caregiver depressive symptoms. Future research could dichotomize neighborhood disorder and use matching or inverse probability weighting to fully examine the relationship between neighborhood disorder and caregiver outcomes. Additionally, the issue of confounding may be present if we did not adjust for all characteristics associated with both the contextual exposures and outcome, such as neighborhood socioeconomic status. Another limitation is that prevalence of neighborhood disorder was quite low; future research should focus on obtaining a detailed neighborhood disorder measure among a larger sample of dementia caregivers. A lack of variation in neighborhood disorder may have influenced the results. Moreover, neighborhood disorder, while seemingly objectively rated by independent observers, could have been more informative if we had data on perceptions of the caregiver or the person with dementia. Also, it would have been informative to understand how the study's findings may vary by racial group (e.g., Black vs. White participants). However, the sample size did not provide

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sufficient power to introduce a 3-way interaction term into the models. Although depressive symptoms are valuable as an outcome, studies with an actual measure of depression are needed. Lastly, the relationship between neighborhood disorder and social cohesion is a complex one; future research should examine how high social cohesion might buffer the impact of high physical disorder on caregiver outcomes.

Despite the limitations of the study, our results provide insight into the complex nature of contextual factors and caregiver outcomes. Findings highlight the importance of an ecological approach to investigating caregiver mental health outcomes. Results from this study suggest that an understanding of caregiver mental health necessitates attention to the interplay of the neighborhood context and social support. The study's findings have implications for examining caregiver mental health within the context with which caregivers live. For those that live in neighborhoods that are less than optimal, supportive and counseling services should be directed towards individuals who also may be caregivers to someone with dementia. For example, senior centers in lower SES neighborhoods might be key places for caregiver support groups. Public health and community-level interventions focused on increasing social cohesion in neighborhoods could be important for maintaining caregiver health.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

Dr. Meyer was partially supported by the National Institute on Aging [P30AG072972, R01AG067541, R24AG063718] and the Alzheimer's Association [AARGD-19-619832]. Dr. Leggett was supported by the National Institute on Aging [K01AG056557] and Michigan Alzheimer's Disease Center [P30 AG053760]. Funding for the National Health and Aging Trends Study and National Study of Caregiving was provided by the National Institute on Aging [P30AG012846 and U01AG032947].

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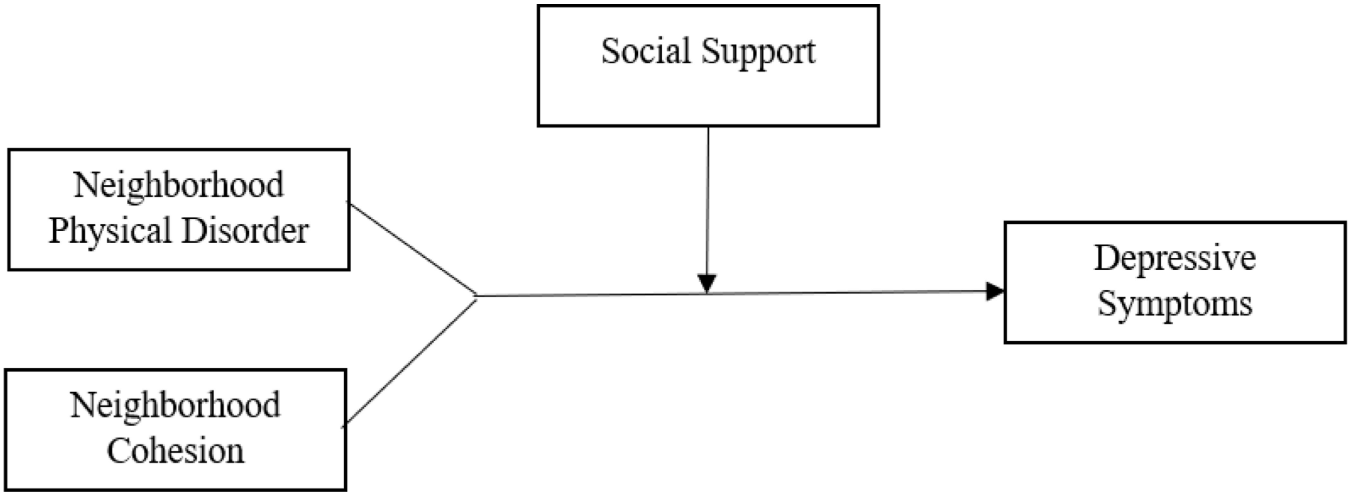

Figure 1.

Conceptual Model of the Association between Neighborhood Characteristics and Caregiver Depressive Symptoms with Social Support as a Buffer Against High Disorder and Low Cohesion.

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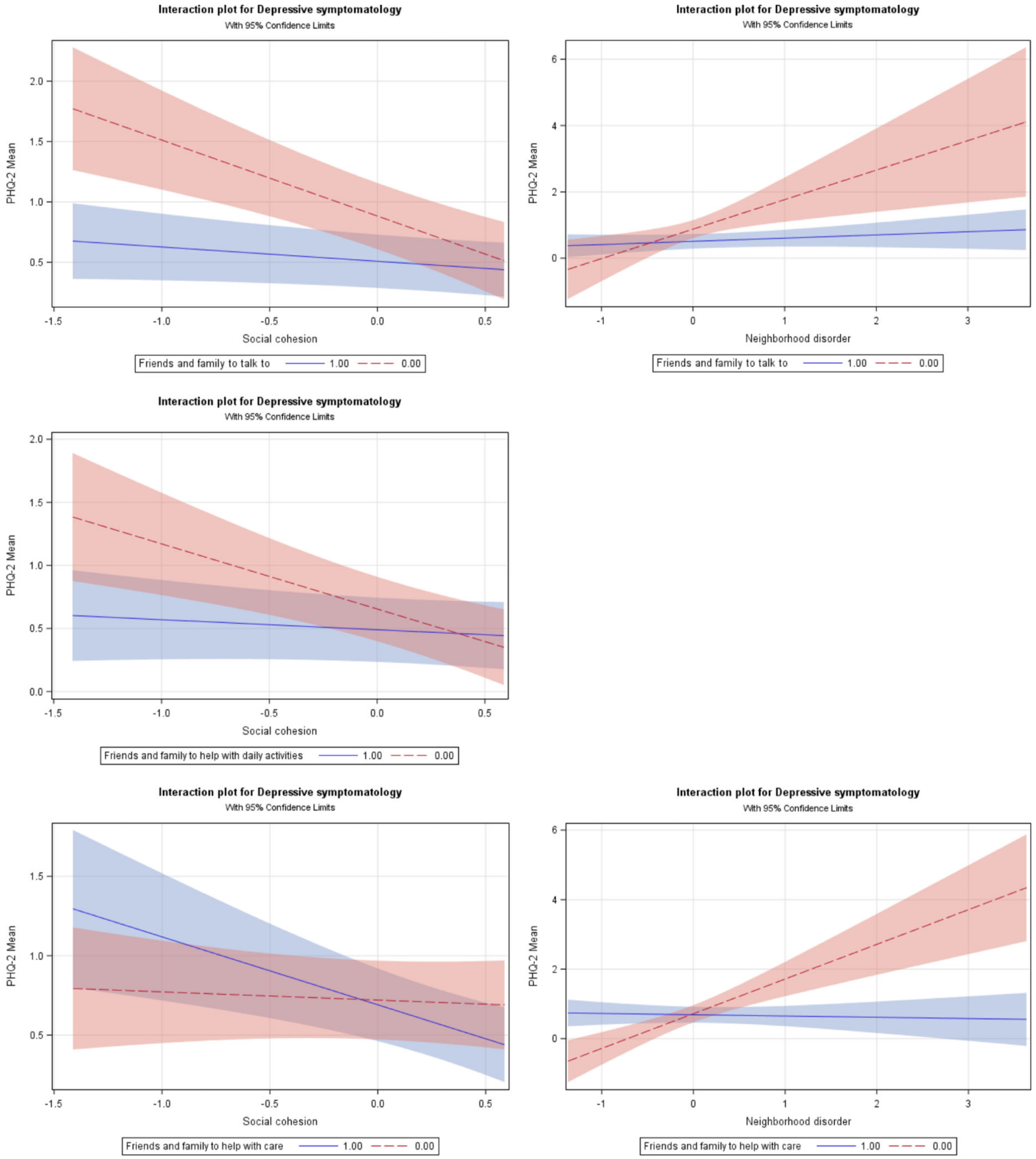

Figure 2.

Moderating effect of social support on relation between neighborhood characteristics and depressive symptoms. 1.00=present; 0.00=absent.

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Table 1.

Sample Characteristics of Caregivers of Older Adults with Dementia (*N* = 956).

Variable	Mean or n (SE or %)
Age	59.07 (0.99)
Female	401 (68.11)
Race	
White	283 (67.41)
Black	223 (16.97)
Other	83 (15.62)
Education	
Less than High School	98 (10.75)
High school	359 (64.22)
Some college or higher	132 (25.03)
Relation to person with dementia	
Spouse	152 (17.01)
Adult Child	274 (55.07)
Other	163 (27.92)
Duration of caregiving, in years	6.82 (0.65)
Activities of Daily Living Score (0–7)	1.07 (0.14)
Instrumental Activities of Daily Living Score (0–5)	1.72 (0.20)
Depressive Symptoms (0–3)	0.59 (0.14)
Neighborhood Disorder Total Score (0–3)	0.09 (0.02)
Social Cohesion (0–2)	1.27 (0.13)
Social Support *	
Friends and family to talk to	507 (80.67)
Friends and family to help with daily activities	347 (56.77)
Friends and family that help with care	418 (78.30)

Note. SE = standard error. Range of variables in parentheses. Percentages for categorical variables are weighted and n’s are unweighted.

* Percentages represent those who report “yes” to each item.

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Table 2.

Factors Associated with Depressive Symptoms Among Caregivers of Older Adults with Dementia ($N = 956$)

	Friends and family to talk to		**Friends and family help with activities**		**Friends and family to help with care**	
	Model 1		**Model 2**		**Model 3**	
Variable	**Estimate (95% CI)**	***p***	**Estimate (95% CI)**	***p***	**Estimate (95% CI)**	***p***
Age	0.01 (0.00, 0.01)	.046	0.005 (−0.002, 0.01)	.17	0.01 (−0.001, 0.01)	.11
Female	0.19 (−0.01, 0.39)	.06	0.15 (−0.05, 0.35)	.14	0.18 (−0.04, 0.39)	.11
Race						
White	0 [Reference]	--	0 [Reference]	--	0 [Reference]	--
Black	−0.13 (−0.33, 0.07)	.19	−0.16 (−0.37, 0.06)	.16	−0.18 (−0.40, 0.06)	.14
Other	−0.26 (−0.44, −0.09)	.003	−0.28 (−0.47, −0.08)	.005	−0.28 (−0.48, −0.07)	.01
Education						
Less than High School	0 [Reference]	--	0 [Reference]	--	0 [Reference]	--
High School	−0.08 (−0.29, 0.12)	.43	−0.12 (−0.35, 0.12)	.33	−0.15 (−0.39, 0.09)	.22
College	−0.30 (−0.53, −0.07)	.01	−0.41 (−0.67, −0.14)	.003	−0.48 (−0.79, −0.16)	.003
Relation to person w/ dementia						
Other	0 [Reference]	--	0 [Reference]	--	0 [Reference]	--
Spouse	0.14 (−0.14, 0.41)	.32	0.22 (−0.09, 0.53)	.16	0.25 (−0.08, 0.58)	.14
Adult Child	0.22 (0.02, 0.41)	.03	0.27 (0.02, 0.51)	.03	0.27 (0.03, 0.51)	.03
Duration of caregiving	−0.004 (−0.01, 0.003)	.27	−0.01 (−0.01, 0.003)	.24	−0.01 (−0.01, 0.004)	.24
ADL Score	0.05 (0.01, 0.09)	.02	0.05 (0.01, 0.09)	.02	0.04 (0.00, 0.09)	.049
IADL Score	−0.04 (−0.09, 0.02)	.18	−0.05 (−0.12, 0.01)	.11	−0.05 (−0.12, 0.02)	.14
Social Support*						
Friends and family to talk to	**−0.62 (−0.96, −0.28)**	<.001	-	-	-	-
Friends and family to help with activities	-	-	**−0.22 (−0.44, −0.001)**	.049	-	-
Friends and family to help with care	-	-	-	-	0.05 (−0.17, 0.28)	.65
Neighborhood Disorder	0.16 (−0.02, 0.33)	.08	0.14 (−0.08, 0.37)	.22	0.15 (−0.09, 0.40)	.22
Social Cohesion	**−0.22 (−0.35, −0.09)**	<.001	**−0.32 (−0.53, −0.11)**	.003	**−0.35 (−0.60, −0.10)**	.01

Note. ADL = activities of daily living; IADL = instrumental activities of daily living. All estimates were weighted using the weights produced by the product of the inverse of the predicted probability of living within 5 minutes from the weighted logistic regression model and the NSOC analytic weights. Estimates are unstandardized.

[*] This item is different for each model and listed at the top.

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Table 3.

Associations between Neighborhood Disorder, Social Cohesion, and Depressive Symptoms by Presence/Absence of Social Support

	Social support					
	Friends and family to talk to		**Friends and family to help with activities**		**Friends and family to help with care**	
Variable[b]	**Estimate (95% CI)**	***p***	**Estimate (95% CI)**	***p***	**Estimate (95% CI)**	***p***
Social Support (SS)						
Friends and family to talk to	−0.37 (−0.56, −0.18)	<.001	-	-	-	-
Friends and family to help with activities	-	-	−0.17 (−0.33, 0.001)	.052	-	-
Friends and family to help with care	-	-	-	-	−0.03 (−0.19, 0.14)	.75
Average Neighborhood Disorder	0.88 (0.27, 1.51)	.01	−0.001 (−0.54, 0.54)	.998	1.00 (0.58, 1.41)	<.001
Average Social Cohesion	−0.63 (−0.93, −0.33)	<.001	−0.52 (−0.82, −0.22)	<.001	−0.05 (−0.26, 0.16)	.63
NBHD [*]SS[d]	**−0.79 (−1.44, −0.15)**	.02	0.22 (−0.42, 0.86)	.51	**−1.03 (−1.52, −0.55)**	<.001
Social Cohesion [*]SS[d]	**0.51 (0.16, 0.86)**	.004	**0.44 (0.07, 0.80)**	.02	**−0.38 (−0.72, −0.04)**	.03

Note. ADL = activities of daily living; IADL = instrumental activities of daily living. All estimates were weighted using the weights produced by the product of the inverse of the predicted probability of living within 5 minutes from the weighted logistic regression model and the NSOC analytic weights. All of the models were adjusted for age, gender, race, education, relationship to person with dementia, duration of caregiving, ADL and IADL scores. Estimates are unstandardized.

[*] This item is different for each model and listed at the top