Elder Abuse as a Risk Factor for Hospitalization in Older Persons

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Abstract

Importance: Elder abuse is associated with increased mortality risk. However, the relationship between elder abuse and health care services utilization remains unclear.

Objective: To examine the relationship between overall elder abuse and specific subtypes of elder abuse and rate of hospitalization in a community-dwelling population of older adults.

Design: Prospective population-based study.

Setting: Chicago Health and Aging Project.

Participants: Of the 6674 community-dwelling older adults who participated in the Chicago Health and Aging Project, 106 were identified by social services agencies for elder abuse

Main Outcomes and Measures: The primary predictor was elder abuse (reported and confirmed) reported to social services agency. The outcome of interest was the annual rate of hospitalization obtained from the Centers for Medicare and Medicaid Services. Poisson regression models were used to assess these longitudinal relationships.

Results: The unadjusted mean annual rate of hospitalization was 0.62 (95% CI, 0.59–0.66) for those without elder abuse and 1.97 (95% CI, 1.33–2.61) for those with reported elder abuse. After adjusting for sociodemographic and socioeconomic variables, medical comorbidities, cognitive and physical function, and psychosocial wellbeing, reported elder abuse had higher rates of hospitalization (rate ratio [RR], 2.00 [95% CI, 1.45–2.75]). Psychological abuse (RR, 2.22 [95% CI, 1.44–3.43]), financial exploitation (RR, 1.75 [95% CI, 1.06–2.90]), caregiver neglect (RR,

2.43 [95% CI, 1.60–3.69]), and 2 or more types of elder abuse (RR, 2.59 [95% CI, 1.82–3.66]) were associated with increased rates of hospitalization, after considering the same potential confounders. Results from interaction term analyses suggested that the association between elder abuse and hospitalization did not differ across the levels of medical comorbidities, cognitive and functional impairment, or psychosocial distress.

Conclusions and Relevance: Elder abuse was associated with increased rates of hospitalization in this community population. Future research is needed to explore the causal mechanisms between elder abuse and hospitalization. As we enter the era of health care reform, an improved understanding of factors that increase rates of hospitalization could also have significant implications for social and health policy as well as clinical care of the vulnerable patients.

Elder abuse, sometimes called elder mistreatment or elder maltreatment, includes physical abuse, sexual abuse, psychological abuse, caregiver neglect, and financial exploitation.[1] Available data suggest that 10% of elderly persons in the United States experience abuse.[2,3] In addition, the most recent data from US Adult Protective Services Agencies depict an increasing trend in the reporting of elder abuse.[4] This trend is particularly alarming, as the literature suggests that elder abuse is associated with increased risk of morbidity and mortality.[5–7] Moreover, the US National Research Council and 2010 National Institute on Aging state-of-science meeting have called for rigorous research on all aspects of elder abuse, especially through population-based epidemiological studies.[1,8] Furthermore, elder abuse has great relevance not only to health care professionals and social services agencies but also to public health professionals, community groups, law enforcement agencies, policy makers, and other relevant disciplines

Despite recent advances in our knowledge of elder abuse, we have incomplete understanding in the health care services utilization among those who are victimized. Prior reports suggest frequent health care services utilization among those who have been abused, neglected, and exploited. Recent population-based studies have provided conflicting results on the association between elder abuse and health care services utilization among those reported to the social services agencies.[9–12] Hospitalization is a significant contributor to the rapidly increasing cost in our health care system. Older adult victims often may be put in situations that may threaten their health and safety, which further increase their likelihood to have more frequent hospitalization. However, we are not aware of any population-based study that has rigorously examined the prospective association between elder abuse and rate of hospitalization in community-dwelling older persons. An improved understanding of important factors that predict hospitalization could inform strategies for health care professionals, social services practice, and health policy.[13,14]

In this article we examine (1) the relationship between elder abuse and the rate of hospitalization within a prospective population-based cohort and (2) the relationship between specific subtypes of elder abuse and hospitalization in the same cohort. We hypothesized that older adults who are abused have increased rates of hospitalization, even after controlling for potential confounders.

METHODS

SETTING

The Chicago Health and Aging Project (CHAP), a community-based study of risk factors for Alzheimer disease among adults 65 years and older began in 1993 (baseline). Its participants include residents of 3 adjacent neighborhoods on the south side of Chicago, Illinois, and are followed up every 3 years. More in-depth details of the study design of CHAP have been previously published.[15,16] In-home data collection occurred in cycles, each lasting 3 years, with each cycle ending as the succeeding cycle began. All CHAP participants received structured inperson interviews. Written informed consent was obtained, and the study was approved by the institutional review board at Rush University Medical Center.

ELDER ABUSE

In the present study, participants included those who were enrolled between 1993 and 2010 and had valid data (83%) on hospitalization history (N=6674) obtained from the Centers for Medicare and Medicaid Services (CMS). From this cohort, we identified a subset of participants (n=106) who were reported to social services agencies for elder abuse. In Illinois, elder abuse is partially mandatory reporting and should occur only if the person over the age of 60 years, due to dysfunction, is unable to report themselves, and elder abuse has occurred within the last 12 months.

At the Illinois Adult Protective Services (APS), the definition used for abuse includes physical abuse, sexual abuse, psychological abuse, neglect, and financial exploitation. Physical abuse was defined as inflicting physical pain or injury on an older adult. Sexual abuse was defined as touching, fondling, intercourse, or any other sexual activity with an older adult, when the older adult was unable to understand, unwilling to consent, threatened, or physically forced. Psychological abuse involved verbal assaults, threat of abuse, harassment, or intimidation. Confinement was defined as restraining or isolating an older adult other than for medical reasons. Neglect was defined as a caregiver's failure to provide an older adult with life's necessities, including, but not limited to, food, clothing, shelter, or medical care. Willful deprivation was defined as willfully denying an older adult medication, medical care, shelter, food, a therapeutic device, or other physical assistance. Financial exploitation included the misuse or withholding of an older adult's resources by another, to the disadvantage of the elderly person or the profit or advantage of someone else. After APS investigation, confirmed elder abuse implied that there was evidence of elder abuse. However, unconfirmed elder abuse cases do not necessarily mean there was no evidence of elder abuse; sometime APS staff could not gain access to older adults or older adult victims refused to cooperate or participate in services.

We matched data from CHAP participants to elder abuse cases reported to social services agencies from 1993 through 2010. Matching was based on an algorithm that compared the following information: date of birth, sex, race, exact home address, zip codes, and the home telephone number. Manual matching was performed by 2 different persons to increase accuracy. This resulted in 106 older CHAP participants who matched a social service agency

record. If a CHAP participant was found to be reported more than once, we selected the first report.

HOSPITALIZATION

Hospitalization records were abstracted from the Medicare Standard Analytic Files (SAFs) obtained from CMS. The CMS had approved the study protocol and data use agreement with the CHAP study to obtain CMS data. The CHAP study has successfully linked participants and their CMS claims data for the Medicare Denominator Files and the SAFs, which contain the record of hospital utilization. For each participant, we have abstracted and summarized SAFs on their number of hospitalizations during the study period.

COVARIATES

Demographic variables include age (in years), sex (male or female), race (self-reported: non-Hispanic black vs non-Hispanic white), income categories (1 [$0-$4999]; 2 [$5000-$9999]; 3 [$10 000-$14 999]; 4 [$15 000-$19 999]; 5 [$20 000-$24 999]; 6 [$25 000-$29 999]; 7 [$30 000-$34 999]; 8 [$35 000$49 999]; 9 [$50 000-$74 999]; 10 [$75 000]), and education (years of education completed). Self-reported medical conditions included the following common conditions: hypertension, diabetes mellitus, stroke, coronary artery disease, hip fracture, and cancer.

Cognitive and physical function has been associated with increased risk for elder abuse.[17–20] A battery of 4 cognitive function tests was administered: 3 included the Mini-Mental State Examination,[21] the East Boston Memory Test,[22] and the Symbol Digit Modalities Test,[23] and to assess global cognitive function, we constructed a summary measure for global cognition (Cronbach α=0.88). Physical function was assessed using the Katz Index of Activities of Daily Living, which measured limitations in an individual's ability to perform basic self-care tasks.[24] Physical function was also assessed by direct performance testing, which provided a comprehensive objective and detailed assessment of certain abilities[25] (Cronbach α=0.79).

Psychosocial factors have been associated with increased risk for elder abuse.[26–30] Psychosocial factors included assessment of depressive symptoms, social network, and social engagement. Symptoms of depression (Cronbach α =0.97) were measured using a modified version[31] of the Center for Epidemiologic Studies of Depression Scale (CES-D).[32] Social network was summarized as the total number of children, relatives, and friends seen at least monthly.[33] Social engagement was assessed by asking how often older adults participate in social activities.

ANALYTIC APPROACH

Descriptive characteristics were provided across the sociodemographic, socioeconomic variables, medical conditions, cognitive function, physical function, and psychosocial factors. Our independent variables of interest were reported elder abuse, confirmed elder abuse, and different subtypes of elder abuse. Our outcome of interest was annual rate of hospitalization, which was summarized for those with and without elder abuse as well as for

specific subtypes of elder abuse. We used the *z* test to compare differences in the rate of hospitalization between groups.

Poisson regression models were used to quantify the relation between elder abuse variables and rate of hospitalization. The Poisson model is a good approach for count data, which in our study is the annual rate of hospitalization. We used a series of models to consider these relationships, taking into consideration the potential confounders. In our core model (model A), we included age and sex. In addition, we added to prior model the variables of race, education, and income to quantify the association between elder abuse and hospitalization outcomes (model B). Moreover, we added to the prior model common medical comorbidities of hypertension, coronary artery disease, stroke, hip fracture, cancer, and diabetes, as well as levels of cognitive function and physical function (model C). Finally, models were repeated, controlling for additional psychosocial measures (model D). We also repeated the prior models A to D to examine the association between confirmed elder abuse and rate of hospitalization.

In addition, we examined the association between elder abuse subtypes of psychological abuse, physical abuse, caregiver neglect (summary measure of neglect, willful deprivation, and confinement) and financial exploitation with the rate of hospitalization by repeating models A to D. Moreover, we conducted analyses comparing those with multiple forms of elder abuse (eg, physical and psychological abuse, or caregiver neglect and financial exploitation). Lastly, to examine the impact of potential moderators in the relationships between elder abuse and rate of hospitalization, we conducted interaction term analyses (eg, cognitive function×elder abuse) to examine the rate of hospitalizations. Rate ratios (RRs) and 95% confidence intervals were reported for the regression models. Statistical analyses were carried out using SAS version 9.2 software (SAS Institute Inc).

RESULTS

BASELINE CHARACTERISTICS

There were 6674 CHAP participants in this study, and 106 participants were identified by social services agencies for elder abuse from 1993 to 2010 (confirmed, 56; psychological abuse, 45; physical abuse, 19; caregiver neglect, 50; and financial exploitation, 65). The characteristics of the cohort are described in Table 1. The mean (SD) age was 72.9 (5.9) years for those with reported elder abuse and 72.9 (6.9) years for those without elder abuse. Those with reported elder abuse vs those without elder abuse were more likely to be women (72% vs 58%), to be black older adults (89% vs 56%), and have lower levels of education (11.3 [3.1] vs 12.5 [3.5] years) and income categories (4.2 [1.9] vs 5.6 [2.6]).

The annual rate of hospitalization was 0.62 (95% CI, 0.59–0.66) for those not reported for elder abuse and 1.97 (95% CI, 1.33–2.61) for those with reported elder abuse was (*z* test, 3.33; *P* < .001) (Table 2). Similar results were found for confirmed elder abuse. In addition, the annual rate of hospitalization was 1.80 (95% CI, 0.982.63) for psychological abuse, 1.91 (95% CI, 0.47–3.35) for physical abuse, 2.77 (95% CI, 1.58–3.97) for caregiver neglect, and 1.56 (95% CI, 0.90–2.21) for financial exploitation. The annual rate of hospitalization was

1.97 (95% CI, 0.89–3.04) for those who experienced 1 type of elder abuse and 2.01 (95% CI, 1.24–2.99) for those who experienced 2 or more types of elder abuse.

ELDER ABUSE AND RATE OF HOSPITALIZATION

In the initial Poisson regression model adjusting for age and sex, reported elder abuse was associated with the increased rate of hospitalization (RR, 2.27 [95% CI, 1.68–3.06) (Table 3, model A). In the last model (model D), after adjusting for psychological and social well-being factors, reported elder abuse remained associated with increased rate of hospitalization (RR, 2.00 [95% CI, 1.45–2.75]). For confirmed elder abuse, our data indicate that elder abuse is associated with an increased rate of hospitalization (RR, 2.72 [95% CI, 1.84–4.03]).

SPECIFIC SUBTYPES OF ELDER ABUSE AND HOSPITALIZATION

To quantify the relation between specific subtypes of elder abuse and hospitalization (Table 4), we used the same Poisson regression model, adjusting for similar previously described factors. In the fully adjusted model, psychological abuse (RR, 2.22 [95% CI, 1.44–3.43]), financial exploitation (RR, 1.75 [95% CI, 1.06–2.90]), and caregiver neglect (RR, 2.43 [95% CI, 1.60–3.69]) were independently associated with increased rate of hospitalization. Moreover, for elder abuse victims who experienced 2 or more forms of abusive acts, there was significant greater rate of hospitalization (RR, 2.59 [95% CI, 1.82–3.66]).

POTENTIAL ASSOCIATED FACTORS BETWEEN ELDER ABUSE AND HOSPITALIZATION

Lastly, we examined the potential factors that might have modified the relationship between elder abuse and hospitalization outcomes (eTable; http://www.jamainternalmed.com). In this analysis, we used a similar Poisson model as previously described, with the addition of interaction terms (eg, elder abuse × medical conditions, elder abuse × physical disability). In the fully adjusted models, we found that the independent association between reported and confirmed elder abuse and hospitalization did not differ by the different levels of sociodemographic, socioeconomic, health-related, or psychosocial factors. This finding was similar for all subtypes of elder abuse as well as multiple types of elder abuse.

COMMENT

In this prospective epidemiological study of 6674 older adults, reported and confirmed elder abuse was independently associated with the increased rate of hospitalization. Moreover, the significant association between elder abuse and hospitalization did not differ by the level of medical comorbidities, cognitive and physical impairment, and/or psychosocial factors.

Our findings build on the results of prior research on elder abuse and health care services utilization. A prior study, Established Populations for the Epidemiologic Studies in the Elderly, found that those who have encounters with adult protective services[10] had an increased risk of nursing home placement. Other studies have indicated that older adults who were reported to adult protective services also have higher rate of health care services utilizations.[11,12] However, a retrospective case-control study of 131 adult protective services

cases found no significant differences in health care services utilizations compared with the matched controls in the same area.[34]

Our findings expand on the results of prior studies. First, our study is the only population-based study to systematically examine the prospective association between elder abuse and rate of hospitalization, demonstrating a significant association between elder abuse and increased rate of hospitalization. Second, our study considered a comprehensive range of potential confounders in the association between elder abuse and rate of hospitalization. Older adults who visit hospitals tend to be older, have more medical comorbidities, have lower socioeconomic status and cognitive and physical health levels, and have greater levels of psychosocial distress.[35–37] However, adjusting for these factors did not ameliorate the significant association between elder abuse and rate of hospitalization. Moreover, interactions terms analyses suggest that the significant association between elder abuse and hospitalization did not vary by the levels of medical comorbidities, cognitive and physical impairment, and/or psychosocial factors.

The present study is the first epidemiological study able to examine the specific subtypes of elder abuse and multiple forms of elder abuse with respect to rate of hospitalization. Improved knowledge of the potential elder abuse-specific associations would improve our understanding to the potential causal association between elder abuse and hospital utilization.[38,39] This information could be useful in future prevention and intervention strategies for those who experience elder abuse. Lastly, hospitalization is enormously expensive and in part responsible for the rapidly increasing health care cost. It is critical for health care providers, social services agencies, and other relevant disciplines to identify older adults who may be at greater risk for abuse and intervene before the deterioration occurs in extremes to warrant hospitalization care. As we enter the era of health care reform, an improved understanding of factors that increase rates of hospitalization could also have significant implications for social and health policy as well as clinical care of the vulnerable patients.

Our study also has a number of limitations. First, our study focused on the reporting of elder abuse to adult protective services as the primary predictor. Elder abuse was not ascertained uniformly for all members of the CHAP population but only for participants referred to the agencies because someone suspected problems. Second, our sample size for the subtypes of elder abuse was relatively small, which might have limited more detailed analyses of elder abuse types and hospitalization. Third, there are likely to be additional factors that may account for the increased hospitalization (eg, infection, injury, reduced physiological and economic reserve). In addition, improved understanding of the interaction between elder abuse and the severities of medical comorbidities and other health-related and psychosocial factors could contribute toward the causal mechanisms between elder abuse and rate of hospitalization. Regrettably, we do not have data to consider these additional confounders in our analyses, which may in part account for the findings in this report.

Our findings have clinical implications for health care providers in screening, prevention, and intervention of elder abuse case. Health care providers focus on preventive care and rigorous management of chronic medical comorbidities to avoid unnecessary hospitalization

and health services use. In our findings, it is interesting that caregiver neglect had potential stronger association with the rate of hospitalization. Health care professionals should consider screening for elder abuse among older patients who may have frequent encounters with hospitals, as well as those who present to hospital settings for dehydration, malnutrition, delirium, and skin ulcers. In addition, health care providers should be trained on the importance of screening for elder abuse because it could be integrated into the routine history and physical examination for older patients. Close monitoring of potential elder abuse victims could help health care providers to more closely monitor the patients and devise interventions to prevent unnecessary hospitalization.

Moreover, our findings could have important implications for other relevant disciplines that work with elder abuse victims. Other health care professionals (nursing, social workers, and social services agencies) who work with elder abuse victims or who are at risk for elder abuse could be in unique positions to further monitor the precipitating and predisposing factors that may exacerbate the unnecessary hospitalizations. In addition, it is important for all relevant disciplines to monitor the severity and the exacerbation of abusive behaviors toward older adults. Identification of signs of elder abuse and devising targeted prevention and intervention strategies could prevent deterioration of abusive acts into more severe forms, which in turn could potentially decrease the unnecessary hospitalization. Close monitoring and improved understanding of risk and protective factors that may exacerbate abusive situations could also help health care providers to leverage family members, social workers, health professionals, and public health and community organizations to create a multidisciplinary approach to care for and protect the elder abuse victims.

In conclusion, elder abuse is independently associated with an increased rate of hospitalization in a community-dwelling population. Future longitudinal investigations are needed to explore the causal mechanisms between specific subtypes of elder abuse and health care services utilization.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding/Support:

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Table 1.

Characteristics of the Study Population

Characteristic	Value, Total Cohort (N = 6674)
Age, mean (SD), y	72.9 (6.9)
Women, No. (%)	3895 (58.4)
Blacks, No. (%)	3756 (56.3)
Education, mean (SD), y	12.5 (3.5)
Income category, mean (SD) (range, 1–10)	5.6 (2.6)
Medical conditions, No. (%)	0.9 (0.9)
Coronary artery disease	859 (12.9)
Stroke	596 (8.9)
Cancer	1239 (18.6)
Hypertension	3267 (49.2)
Diabetes	422 (6.3)
Hip fracture	219 (3.3)
Test or index, mean (SD), score	
Global cognitive function	0.23 (0.80)
MMSE	26.4 (4.9)
Katz	0.3 (1.1)
Nagi[a]	0.9 (1.3)
Rosowand Breslau[b]	0.6 (0.9)
Physical performance testing	10.5 (3.7)
Depressive symptoms	1.4 (1.9)
Social engagement	2.4 (1.7)
Social network	7.5 (6.5)

Abbreviation: ADLs, activities of daily living; MMSE, Mini-Mental State Examination.

[a] Nagi: index of basic physical activity and measures the activities of upper or lower extremity function.

[b] Rosow and Breslau: index of mobility for household-related activities.

Table 2.

Elder Abuse and Rate of Hospitalization

	Rate of Hospitalization				
	Mean (95% CI)	Median (IQR)	z Test	P Value
No elder abuse (n = 6568)	0.62 (0.59-0.66)	0.22 (0.66)	NA	NA
Reported elder abuse (n = 106)	1.97 (1.33-2.61)	0.58 (2.48)	3.33	<.001
Confirmed elder abuse (n = 56)	2.00 (1.24-2.75)	0.62 (2.95)	2.61	.009
Specific elder abuse subtypes				
Caregiver neglect (n = 50)	2.77 (1.58-3.97)	1.14 (3.84)		
Psychological abuse (n = 45)	1.80 (0.98-2.63)	0.45 (2.57)	3.44	<.001
Physical abuse (n = 19)	1.91 (0.47-3.35)	0.45 (2.57)		
Financial exploitation (n = 65)	1.56 (0.90-2.21)	0.40 (1.51)		
Multiple types of elder abuse				
1 Type (n = 51)	1.97 (0.89-3.04)	0.49 (1.87)	1.93	.054
≥2 Types (n = 55)	2.01 (1.24-2.99)	0.75 (2.82)	2.83	.005

Abbreviations: IQR, Interquartile range; NA, not applicable.

Table 3.

Reported and Confirmed Elder Abuse and the Risk of Hospitalization

	RR (95% CI)			
	Model A	**Model B**	**Model C**	**Model D**
Reported elder abuse	2.27 (1.68–3.06)	2.04 (1.49–2.79)	1.95 (1.41–2.69)	2.00 (1.45–2.75)
Age	1.04 (1.04–1.05)	1.03 (1.03–1.04)	1.01 (1.01–1.02)	1.01 (1.01–1.02)
Men	1.09 (1.02–1.17)	1.17 (1.09–1.26)	1.21 (1.13–1.29)	1.20 (1.12–1.29)
Black	…	0.97 (0.90–1.05)	0.81 (0.75–0.87)	0.81 (0.75–0.88)
Education	…	0.97 (0.96–0.99)	0.99 (0.98–1.00)	0.99 (0.99–1.01)
Income	…	0.95 (0.93–0.97)	0.96 (0.95–0.98)	0.97 (0.95–0.98)
Medical conditions	…	…	1.24 (1.19–1.29)	1.23 (1.19–1.28)
Cognitive function	…	…	0.96 (0.81–0.91)	0.87 (0.82–0.92)
Physical function	…	…	0.94 (0.92–0.95)	0.94 (0.93–0.95)
Depressive symptom	…	…	…	1.05 (1.03–1.07)
Social engagement	…	…	…	0.98 (0.95–0.99)
Social network	…	…	…	1.01 (1.00–1.01)
Confirmed elder abuse	2.97 (2.04–4.31)	2.84 (1.97–4.08)	2.76 (1.87–4.07)	2.72 (1.84–4.03)
Age	1.04 (1.04–1.05)	1.03 (1.03–1.04)	1.01 (1.01–1.02)	1.01 (1.01–1.02)
Men	1.09 (1.02–1.17)	1.17 (1.09–1.26)	1.21 (1.13–1.29)	1.20 (1.12–1.29)
Black	…	0.97 (0.90–1.05)	0.81 (0.74–0.87)	0.81 (0.75–0.88)
Education	…	0.97 (0.96–0.98)	0.99 (0.98–1.00)	0.99 (0.99–1.01)
Income	…	0.95 (0.93–0.97)	0.96 (0.95–0.98)	0.97 (0.95–0.98)
Medical conditions	…	…	1.24 (1.19–1.29)	1.23 (1.19–1.28)
Cognitive function	…	…	0.86 (0.81–0.91)	0.87 (0.82–0.92)
Physical function	…	…	0.93 (0.92–0.95)	0.94 (0.93–0.95)
Depressive symptom	…	…	…	1.05 (1.03–1.07)
Social engagement	…	…	…	0.98 (0.96–0.99)
Social network	…	…	…	1.01 (1.00–1.01)

Abbreviations: RR, risk ratio; ellipses, not included in model.

Table 4.

Elder Abuse Subtypes and Hospitalization[a]

Subtype	RR (95% CI)	P Value
Psychological abuse	2.22 (1.44–3.43)	<.001
Physical abuse	1.57 (0.83–2.98)	.17
Financial exploitation	1.75 (1.06–2.90)	.03
Caregiver neglect	2.43 (1.60–3.69)	<.001
1 Type of elder abuse	1.41 (0.75–2.65)	.29
2 Types of elder abuse	2.59 (1.82–3.66)	<.001

Abbreviation: RR, risk ratio.

[a]Model: adjusted for age, sex, race, education and income, hypertension, diabetes, stroke, cancer, hip fracture, coronary artery disease, Mini-Mental State Examination, East Boston Memory Test, East Boston Delayed Recall, and Symbol Digit Modality Test, physical function, depressive symptoms, social engagement, and social network.