Elder Self-Neglect Is Associated with Increased Rate of 30 Day Hospital Readmission: Findings from the Chicago Health and Aging Project

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Abstract

Background—Elder self-neglect is associated with increased morbidity and mortality. The objective of this study is to examine the prospective relationship between reported elder self-neglect and rate of 30 day hospital readmission in a community population.

Methods—Prospective population-based study of community-dwelling older adults who participated in the Chicago Health and Aging Project. Of the 7,219 participants in the Chicago Health and Aging Project, a subset of 1,228 participants was reported to social services agency for suspected elder self-neglect. The primary predictor was elder self-neglect reported to social services agency. Outcome of interest was the annual rate of 30 day hospital readmission calculated from the Center for Medicare and Medicaid System hospitalization data from 1993-2009. Poisson regression models were used to assess these relationships.

Results—The average annual rate of 30 day hospital readmission for those without elder self-neglect was 0.2 (0.7) and for those with reported elder self-neglect was 0.9 (2.8). After adjusting for sociodemographic, socioeconomic, medical commorbidities, cognitive function, physical function, and psychosocial wellbeing, elders who self-neglect had significant higher rate of 30 day hospital readmission (RR, 2.50, 95% CI, 2.02-3.10). Greater self-neglect severity (Mild: PE=1.09, SE=0.19, p<0.001; Moderate: PE=0.84, SE=0.13, p<0.001; Severe: PE=1.24, SE=0.40, p=0.002) were associated with increased annual rates of 30 day hospital readmission, after considering same

confounders. Interaction term analyses suggest that the significant relationship between self-neglect and 30 day hospital readmission was not moderated by medical conditions, cognitive impairment, physical disability or psychosocial wellbeing.

Conclusion—Reported elder self-neglect was associated with increased rates of 30 day hospital readmission in this community population. Greater self-neglect severity was associated with a greater increase in the rate of 30 day hospital readmission.

Keywords

elder self-neglect; 30 day hospital readmission; population-based study; self-neglect; hospitalization; elder abuse; health care cost; health services use

INTRODUCTION

Elder self-neglect is an understudied public health issue and is associated with significant adverse health outcomes. Although there is a great paucity in our current understanding of self-neglect, recent publication from the Chicago Health and Aging Project suggests that 1 out of 9 older adults experiences some form of self-neglect in community setting (1) and evidence suggest that reports of self-neglect to social services agencies are rising (2). Moreover, elder self-neglect is independently associated with increased risk of premature all cause and cause specific mortality, and there is a gradient association between higher self-neglect severity and greater risk for all cause mortality (3;4). Furthermore, self-neglect has great significance not only to health care providers and local and state social services agencies, but also to public health advocates, legal profession, community-based groups and other relevant aging disciplines.

The National Centers on Elder Abuse categorizes elder self-neglect as "...as the behavior of an elderly person that threatens his/her own health and safety. Self-neglect generally manifests itself in an older person as a refusal or failure to provide himself/herself with adequate food, water, clothing, shelter, personal hygiene, medication (when indicated), and safety precautions" (5). Recent epidemiological research have lead to significant improved understanding of the self-neglect and its specific subtypes in community-dwelling aging populations (6;7). Equally important, these self-neglecting behaviors could potentially lead to increased utilization of health care services, which will likely place added burden on the current health care systems (8;9). However, there remain gaps in our understanding in the health services utilizations among those who self-neglect.

Hospitalization is one of the greatest contributors of rising cost in our current health care system. Over the last century, there has been remarkable scientific advances and increased ability to device preventive health services and disease prevention strategies in order to prevent unnecessary hospitalizations. Prior case reports suggest frequent health services utilization among those identified as self-neglectors (10;11). Recent epidemiological studies have provided conflicting results in health services utilizations among self-neglectors after being identified by the social services agency (8;9;12;13).

Preventable hospital readmission is a significant avoidable cost in the US health care system, costing an estimated $25 billion annually (14). Nearly one in every 5 Medicare patients discharged from the hospital is readmitted within 30 days (15). This is especially concerning as the Affordable Care Act is taking effect and Medicare is concentrating on reducing hospital readmission by 20% or to potentially impose financial penalties on hospitals with higher than average readmission rates. Recent study indicates that self-neglect is independently associated with increased rate of hospitalization (9), yet the association between self-neglect and 30 day hospital readmission remain unclear.

Moreover, most prior epidemiological research have categorized self-neglect dichotomously as "self-neglect" or "no self-neglect". However, self-neglect, like many other geriatric syndromes, occurs along a continuum of severity, rather than in two discrete categories (16). Evidences suggests that improved understanding of the full spectrum of self-neglect is just as important, and that there is a gradient association between the greater self-neglect severity and morbidity and mortality (3;4). However, we are not aware of any study that has systematically quantified the relations between the spectrum of self-neglect severity and 30 day hospital readmission in the community-dwelling populations.

In this report, we aim to quantify: 1) the relationship between reported self-neglect and the rate of 30 day hospital readmission within a prospective population-based study; and 2) the relationship between the continuum of self-neglect severity and 30 day hospital readmission in the same population. We hypothesized that older adults with reported self-neglect have increased rates of 30 day hospital readmission, and that there is a gradient relationship between greater self-neglect severity and higher rate of 30 day hospital readmission. Addressing these gaps will contribute the current paucity in our understanding of the consequences of self-neglect and will be critical to educate the public on the consequences of self-neglect and provide data that could inform practice and policy at the local, state and national level.

METHODS

Setting

Chicago Health and Aging Project (CHAP) begun in 1993 to was aimed to examine risk factors for Alzheimer's disease. Its participants include residents of three adjacent neighborhoods on the south side of Chicago. More in depth details of the study design of CHAP have been previously published (17;18). Briefly, the study enrolled residents aged 65 years and older of three adjacent neighborhoods on the south side of Chicago. In 1993, the study began with a complete census of the community area. The census identified 7,813 age-eligible residents, 6,158 (78.9%) of whom were enrolled between 1993 and 1997. In 2000, CHAP began to enroll successive cohorts of participants from the study community who had turned 65 since inception of the study. Data collection occurs in three-year cycles, with each follow-up cycle beginning after the conclusion of the previous cycle. Follow-up participation rate averaged 80-85% of survivors at each cycle. Each data-collection cycle includes an in-person interview conducted in the participants' homes. The interviews include standardized questionnaires and tests for the assessment of health history, and environmental observations.

Participants

This study included participant who were enrolled in CHAP study and had data on hospitalization history (N=7,219) obtained from the Center for Medicare and Medicaid Services. From this cohort, we identified 1,228 participants who were reported to social services agency for suspected elder self-neglect. These 1,228 participants were subset of the total cohort of 7,219 participants. Suspected cases of elder self-neglect were reported by friends, neighbors, family, social workers, city workers, health care professionals, and others. The reports were usually initiated based on the concerns for the health and safety for the older adult, which in turn would initiate a wide array of social and legal services to help them. CHAP and social services data were matched using variables of date of birth, gender, race, home telephone number and exact home address. All CHAP participants received structured, standardized in-person interviews that included assessment of health history. Written informed consent was obtained, and the study was approved by the Institutional Review Board at Rush University Medical Center.

Predictor: Reported and Confirmed Elder Self-Neglect

Elder self-neglect in this study was based on all suspected cases reported to social services agency. When a case was reported, a caseworker performed a home assessment, which rates the unmet needs in the domains of personal hygiene and grooming, household and environmental hazards, health needs and overall home safety concerns. A total of 15 items were used to rate the degree of unmet needs and each items were scored on the scale of 0 to 3, with higher number indicating greater danger to health and safety. The level of severity was rated by case workers based on their concerns for the client's personal health and safety, with the maximum cumulative score of 45.

Confirmed self-neglect in this study was defined as anyone with a score of 1 or greater (N=963) which are a subset of the reported cases of self-neglect to social services agency. Through this approach, it will permit a broader examination of elder self-neglect severity across the continuum. Elder self-neglect severity (only among those with confirmed elder self-neglect) refers to the scores 1 to 45, with higher scores within this range indicating greater levels of elder self-neglect severity. The details of this measure has been previously described (19-24). Available information from the social services agency internal report (25) showed that this measure had inter-rater reliability coefficients great than 0.70 and the internal consistencies were high with Cronbach's alpha of 0.95 (21). In addition, external validity of the measure was assessed and shown to predict increased risk of premature mortality (3).

Outcome: Hospital Readmission

Hospitalization records were abstracted from the Medicare Standard Analytic Files (SAFs) obtained from the Centers for Medicare and Medicaid Services (CMS). CMS has approved the Study Protocol and Data Use Agreement with the CHAP study to obtain CMS data. CHAP study has successfully linked participants and their CMS claims data for the Medical Denominator Files and the SAF files which contains the record of hospitalization. 30 day hospital readmission were characterized by two consecutive hospital admissions, where the date of discharge from the 1st hospitalization and date of admission from the 2nd

hospitalization is less or equal to 30 days for a given participant. For each participant, we have abstracted and summarized SAF files on their number of 30 day hospital readmission after the identification of self-neglect to the last available CMS data in December 2009.

Covariates

Demographic variables include age (in years), gender (men or women), race (self-reported: non-Hispanic black versus non-Hispanic white), education (years of education completed), and income categories (1=$0-4,999; 2=$5,000-9,999; 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 over). The parent CHAP study also collected self-reported medical conditions of hypertension, diabetes mellitus, stroke, coronary artery disease, hip fracture, and cancer.

A battery of four cognitive function tests was administered: the Mini-Mental State Examination (MMSE) (26), immediate and delayed recall of brief stories in the East Boston Memory Test (27) and the Symbol Digit Modalities Test (28). To assess global cognitive function with minimal floor and ceiling artifacts, we constructed a summary measure for global cognition based on all 4 tests. Individual test scores were summarized by first transforming a person's score on each individual test to a z-score, which was based on the mean and standard deviation of the distribution of the scores of all participants on that test, and then averaging z scores across tests to yield a composite score for global cognitive function. This procedure has the advantage of increasing power by reducing random variability present within tests, as well as reducing floor and ceiling effects of particular tests. In addition, it produces a composite score that is approximately normally distributed.

Physical function was assessed using the Katz Index of Activities of Daily Living (Katz ADL), which measured limitations in an individual's ability to perform basic self-care tasks (29). Physical function was also assessed by direct performance testing, which provided a comprehensive objective and detailed assessment of certain abilities. Lower-extremity performance tests consisted of measures of tandem stand, timed walk, tandem walk, and ability to rise to a standing position from a chair. The tests requiring walking performance were quantified in terms of both the number of seconds to complete the task. Other tests were measured in terms of the number of trials completed within a specified time period. Most of these performance tests were used in the Established Populations for Epidemiologic Studies of the Elderly (EPESE) project (30) and in other large-scale studies of disability. Summary measures of these above tests were created as physical performance test scores. Lower score indicate impairment in these above activities and tasks which are often needed for independent living and may contribute toward physical disability.

Psychosocial factors have been associated with increased risk for elder abuse (31-35). Psychosocial factors included assessment of depressive symptoms, social network and social engagement. Symptoms of depression were measured using a modified version (36) of the Center for Epidemiologic Studies of Depression Scale (CES-D) (37). Social network was summarized as the total number of children, relatives, and friends seen at least monthly (38). Social engagement was assessed by asking how often older adults participate in social activities such as going to movies, library, senior centers and other social events outside of

house. The scale consists of 12-items and 4-point scale of frequency and is summarized for this study.

Analytic Approach

Univariate analyses were provided for those with and without 30 day hospital readmissions groups across the age, gender, race, education, income, medical commorbidities, and cognitive function, physical function, depressive symptoms, and social engagement. Our independent variables of interest were reported self-neglect, confirmed self-neglect, and self-neglect severity (only derived from confirmed self-neglect). Our outcome of interest was annual rate of 30 day hospital readmission. In addition, we calculated the annual rate of 30 day hospital readmission for the different severities of elder self-neglect (Mild = score of 1-15; Moderate = score of 16-30; and Severe = score of 31-45). We compared the differences in the rate of 30 day hospital readmission between groups.

Poisson regression models were used to quantify the relation between elder self-neglect and rate of 30 day hospital readmission. Given the participants were recruited at different time point throughout the CHAP study, a log (time) variables were used in all models. 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 30 day hospital readmission 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-D to examine the association between elder self-neglect and rate of 30 day hospital readmission.

Then, we examined the relationship between full spectrum of elder self-neglect severity as a continuous variable and rate of 30 day hospital readmission by repeating Models A-D. Moreover, we repeated these models for levels of self-neglect severity (Mild = 1-15; Moderate = 16-30; and Severe = 31-45) and rate of 30 day hospital readmission. Lastly, we conducted interaction term analyses for the same models to examine the effect of health-related factors and self-neglect, with respect to the rate of 30 day hospital readmission (i.e., medical conditions × self-neglect, cognitive function × self-neglect, physical function × self-neglect, depressive symptoms × self-neglect and social engagement × self-neglect). Rate Ratio (RR), 95% Confidence Interval (CI), Standardized-Parameter Estimates (PE), Standard Error (SE) and P values were reported for the regression models. Analyses were carried out using SAS®, Version 9.2 (SAS Institute Inc., Cary, NC).

RESULTS

Baseline Characteristics

Of the 7,219 CHAP participants in this study, a subset of 1,998 participants had 30 day hospital readmissions and 5,221 participants who did not have 30 day hospital readmissions. The mean age of those with 30 day readmission was 75.0 years (standard deviation [SD] =

7.1 years) and those without was 73.2 (7.2) (**Table 1**). The annual rate of 30 day hospital readmissions for those without self-neglect was 0.18 (0.72) and for those with reported elder self-neglect was 0.89 (2.77) (p<0.001) (**Table 2**). Similar results were found for confirmed self-neglect. In addition, the study found an increase in the levels of self-neglect severity and 30 day hospital readmissions. The annual rate of hospitalization utilization for mild self-neglect was 0.97 (3.31), for moderate self-neglect was 0.89 (2.55) and for severe self-neglect was 1.74 (4.18) (p<0.001).

Elder Self-Neglect and Rate of 30 Day Hospital Readmission

In the initial Poisson regression model adjusting for age, gender, we found that reported elder self-neglect independently predicted the increased rate of 30 day hospital readmissions (RR, 3.69, 95%CI, 3.08-4.42) (**Table 3**, Model A). After adding socioeconomic variables of race, education and income as potential confounders (Model B), the association diminished slightly (RR, 3.08, 95%CI, 2.56-3.71). Then we added common chronic medical conditions of hypertension, diabetes, stroke, cancer, thyroid disease, myocardial infarction, cognitive function, and physical function to the model (Model C), the association decreased but remained significant (RR, 2.32, 95%CI, 1.91-2.81). In the last model (Model D), after adjusting for depressive symptoms and social engagement measures, reported elder self-neglect remained an independent predictor of increased rate of 30 day hospital readmissions (RR, 2.30, 95%CI, 1.89-2.80). For confirmed elder self-neglect, the associations were similar (**Table 3**).

Elder Self-Neglect Severity and 30 Day Hospital Readmission

To quantify the relation between elder self-neglect severity and 30 day hospital readmissions, an initial Poisson regression model adjusting for age and gender was created with 30 day hospital readmissions as the outcome (Model A). The coefficient representing the association of every point increase in self-neglect severity score (range 1-45) and 30 day hospital readmissions was (PE, 0.03, SE, 0.01, RR, 1.03, 95% CI, 1.01-1.04, p=0.003), suggesting a statistically significant association between greater severities of elder self-neglect and increased rates of 30 day hospital readmissions. After adding for race, income and education (Model B), the significant association remains (PE, 0.03, SE, 0.01, RR, 1.03, 95% CI, 1.01-1.04, p=0.001). Then, we added chronic medical conditions of hypertension, diabetes, stroke, cancer, thyroid disease, coronary artery disease, cognitive and physical function to the model (Model C), the association remained statistically significant (PE, 0.02, SE, 0.01, RR, 1.02, 95% CI, 1.01-1.04, p<0.01). In the last model (Model D), after adding psychosocial measures to prior model, the coefficient changed minimally and remained statistically significant (PE = 0.02, SE, 0.01, RR, 1.02, 95% CI, 1.00-1.04, p<0.01). **Figure 1** graphically represents greater self-neglect severity (range 1-45) and rate of 30 day hospital readmissions in the fully-adjusted model.

We quantified the relation between categorically defined levels of self-neglect severity and rate of 30 day hospital readmissions (**Table 4**). In the core model (Model A), mild self-neglect (PE, 1.38, SE, 0.19, RR, 4.01, 95% CI, 2.75-5.84, p<0.001), moderate self-neglect (PE, 1.37, SE, 0.12, RR, 3.94, 95% CI, 3.12-4.96, p<0.001) and severe self-neglect (PE, 1.88, SE, 0.38, RR, 6.55, 95% CI, 3.06-13.99, p<0.001) were all independent associated

with the increased rate of 30 day hospital readmissions. In models B and C, addition of race, education, income, chronic medical conditions and cognitive function did not significantly change the associations between self-neglect severity and rate of 30 day hospital readmissions. In the fully-adjusted model (Model D), mild self-neglect (PE, 1.09, SE, 0.19, RR, 3.00, 95%, 2.07-4.34, p<0.001), moderate self-neglect (PE, 0.84, SE, 0.13, RR, 2.33, 95% CI, 1.81-2.98, p<0.001) and severe self-neglect (PE, 1.24, SE, 0.40, RR, 3.45, 95% CI, 1.57-7.58, p=0.002) were all independent associated with the increased rate of 30 day hospital readmissions.

Interaction Term Analyses between Self-Neglect and Health-Related Factors

Lastly, we examine the interaction effect of self-neglect with health related factors with respect to the rate of 30 day hospital readmissions (**Table 5**). For medical conditions, interaction term (medical conditions × self-neglect) was not statistically significant (PE, 0.00, SE, 0.01, RR, 1.00, 95%CI, 0.98-1.02, p=0.56), suggesting medical conditions did not significantly modify the relationship between self-neglect and rate of 30 day hospital readmissions. Similar non-statistically significant results were found for interaction term analyses for cognitive function, physical function, depressive symptoms, social engagement and self-neglect with respect to the rate of 30 day hospital readmissions outcome.

DISCUSSION

We found that reported and confirmed elder self-neglect independently associated with the increased risk of 30 day hospital readmissions. In addition, greater severity of elder self-neglect was associated with the greater risk of 30 day hospital readmissions. Moreover, the significant relationship between self-neglect and 30 day hospital readmissions was not moderated through the presence of medical comorbidities, cognitive impairment, physical disability and psychosocial factors.

Prior study from the Established Populations for the Epidemiologic Studies in the Elderly (EPESE) identified 120 cases of self-neglect through manual dataset matching (13) and found that self-neglect was associated with increased risk of nursing home placement. Other study has also indicated that older adults who have encounters with Adult Protective Services agencies have greater utilization of behavioral health services (39). Recent findings from the CHAP study indicate that both reported and confirmed self-neglect has almost 1.5 fold increase in the rate of hospitalization (RR,1.47, 95%CI, 1.39-1.55) (9). However, a recent retrospective case-control study of 131 self-neglect cases found no significant differences in health care utilizations compared the matched controls in a Texas population (12).

While there are multiple reasons for the hospital readmission, evidence suggest that improved care transitions and interdisciplinary efforts are critical to potentially reduce hospital readmissions (40-42). If the self-neglecting behaviors are the seminal factors that lead to the decline in health conditions (congestive heart failure, skin infection, falls, etc) that warrants hospital admission, then stabilizing the health deteriorations will unlikely change the root of the problem. If a self-neglecting older adult is send home for which the self-neglecting behaviors are likely to continue, unless health care professionals address the

issues of self-neglect, it is likely that vicious cycle will continue and health will deteriorate which may further warrant hospital admission.

Our findings contribute to the field of elder self-neglect and its adverse health outcomes. First, our study systematically examined the prospective association between self-neglect and rate of 30 day hospital readmissions; demonstrating a significant association between elder self-neglect increased rate of hospital readmissions. The study population is socio-demographically and socioeconomically diverse and has been well characterized for more than 17 years, which contribute toward the generalizability in community populations of older adults.

Second, our study took into consideration a wide range of potential confounders in the relationship between elder self-neglect and rate of hospital readmissions. Older age, lower levels of socioeconomic status, more medical commorbidities, lower levels of cognitive and physical health and psychosocial distress have been associated with increased risk for health services utilization. However, adjusting for these factors did not significantly reduce the significant relationship between self-neglect and rate of hospital readmissions.

Third, our study examined the continuum of elder self-neglect with respect to rate of 30 day hospital readmissions, rather than strictly categorically defined self-neglect. Our study findings contribute to the associations between self-neglect severity and rate of hospital readmissions. This information fills an important gap to the better understanding of the potential causal association between self-neglect and health services utilization. It is important for professionals, social services agencies and other relevant disciplines to identify older adults at risk for self-neglect and intervene before self-neglecting behaviors become more severe, which might then necessitate hospital readmissions.

The potential causal mechanims between elder self-neglect and hospital readmissions requires additional investigation. We took into consideration a series of sociodemographic, socioeconomic characteristic, medical commorbidities, cognitive function, physical function and psychosocial factors. However, adjustments for these factors did not significantly modify the relationship between self-neglect and rate of 30 day hospital readmissions. Metabolic abnormalities, nutritional deficiencies, infections, injuries or trauma may be other factors that account for the association between elder self-neglect and rate of hospital readmissions, but these factors were not considered in this analysis. Severity of medical commorbidities (ejection fraction of a congestive heart failure patient, Forced Expiratory Volume of a COPD patient, etc) could another important factors in determining the causal mechanisms between self-neglect and hospital readmissions. It is conceivable that self-neglect could exacerbate the existing medical conditions, which could predispose a higher rate of hospital readmissions. Future studiesa re needed to quantify these relations.

Our study also has limitations. First, a limitation of using CMS data is selective under-detection of some services including use of Veterans Administration facilities and some managed care episodes. This under-detection of our outcomes of interest may potentially underestimate the strength of association between self-neglect and 30 day hospital readmissions. Second, this study could not examine the relation between specific indicators/

behaviors of self-neglect and rate of hospital readmissions, as the precise understanding of self-neglect phenotypes (i.e., environmental neglect vs. personal hygiene, etc) could improve our understanding of the causal mechanism. Future studies are needed to examine the relation between specific phenotypes of self-neglect and hospital readmissions. Third, we do not have details on the admitting and discharge diagnosis codes of the first and subsequent hospitalizations to delineate if the readmission diagnoses are the same. Future research is needed to quantify these relationships.

Fourth, our study does not have available data on other health services utilization measures (i.e., outpatient clinic visit, home health visit, or nursing home placement, etc). This information could help to explain the temporal relationships between self-neglect and hospital readmissions. Fifth, we do have information on the client's social support system or the social context of the self-neglecting behaviors that might further increase the risk of hospital readmissions. Sixth, we have neither data on Medicaid status or duo-eligible status of the participants, nor data on the specific types and reasons for hospital readmissions or the potential differential use of intensive care unit for those who self-neglect. This data could be important to consider as additional confounders or mediators in our analyses, which may in-part account for the findings in this report. However, this study sets the foundation for future study of self-neglect to systematically examine these issues in representative populations.

Our findings have potential implications in the prevention, detection, and management of elder self-neglect. Health care professionals should consider routine screening for self-neglect among older patients who may have frequent encounters with health care systems. Close monitoring of older adults who self-neglect could help clinicians to more closely monitor the patients and set the basis for future intervention study to examine the effectiveness of screening for self-neglect in the community population.

Our findings could have important implications not only for clinicians, but also across multiple disciplines, which work with older adults with self-neglect. Other relevant medical disciplines, legal professionals, nursing, social workers, social services agencies who work with elders who self-neglect or who are at risk for self-neglect, could be in unique positions to identify and intervene on predisposing factors that might increase the unnecessary hospital readmissions. Our finding could also have implications for legal and law enforcement professionals, especially relating to guardianship proceedings for older adults who have the most severe form of self-neglecting behaviors.

Moroever, it is important for aging professionals to monitor the severity or the progression of self-neglecting behaviors in older adults. Early identification of milder forms of self-neglect and devising targeted prevention and intervention strategies, could prevent deterioration of self-neglect into more severe forms, which in turn could potentially decrease the unnecessary hospital readmissions. Vigorous monitoring and betters understanding of factors that might worsen self-neglect severity could also help clinicians to work closely with concerned family members, social workers, legal professionals, health professionals, and public health and community organizations to create a multi-disciplinary approach to care for this vulnerable population.

Future epidemiological research is needed to examine the temporal associations of targeted risk/protective factors associated with self-neglect (43). Future studies are needed to explore the longitudinal association between self-neglect to the rate as well as the intensity of other forms of health services utilization. Future studies are needed to examine the effectiveness of current prevention and intervention strategies for elder self-neglect with respect to health services utilization outcomes in community populations. Future studies are needed to explore the racial/ethnic differences in elder self-neglect and health services utilization in socioeconomically diverse populations (44).

Conclusion

With the context of a large cohort study, elder self-neglect is independently associated with an increased annual rate of 30 day hospital readmissions. In addition, there is an association between greater self-neglect severity and higher rates of hospital readmissions. Future longitudinal research are needed to examine the potential causal inferences between specific self-neglect behaviors and various form of health services utilization.

ACKNOWLEDGMENTS

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Table 1

Characteristics of the Cohort by 30-Days Hospital Readmission Status (N=7219)

	Readmission: Yes N=1,998	Readmission: No N=5,221
Age, years, mean, (SD)	75.0 (7.1)	73.2 (7.2)
Men, number (%)	867 (43.4)	2093 (40.1)
Blacks, number (%)	1185 (59.3)	3260 (62.4)
Education, years, mean, (SD)	11.9 (3.7)	12.4 (3.5)
Income Categories, mean (SD)	4.9 (2.5)	5.3 (2.5)
Medical Conditions	1.2 (1.0)	1.0 (0.9)
Coronary Artery Disease, number (%)	380 (19.1)	672 (12.9)
Stroke, number (%)	278 (13.9)	482 (9.2)
Cancer, number (%)	411 (20.6)	984 (18.9)
Hypertension, number (%)	1061 (53.3)	2614 (50.3)
Diabetes, number (%)	222 (11.1)	354 (6.8)
Hip Fracture, number (%)	93 (4.7)	171 (3.3)
Global Cognitive Function, mean (SD)	0.0 (0.9)	0.2 (0.8)
MMSE, mean (SD)	25.2 (6.2)	26.1 (5.1)
Katz, mean (SD)	0.6 (1.4)	0.4 (1.2)
Physical Performance Testing, mean (SD)	9.1 (4.3)	10.3 (3.8)
Depressive Symptoms, mean (SD)	1.8 (2.2)	1.5 (1.9)
Social Engagement, mean (SD)	2.1 (1.7)	2.4 (1.7)
Elder Self-Neglect, number, %	390 (31.8)	1608 (26.8)