

Four Subtypes of Self-Neglect in Older Adults: Results of a Latent Class Analysis

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OBJECTIVES: To determine whether there are subtypes of elder self-neglect (SN) with different risk factors that can be targeted using medical and social interventions.

DESIGN: Cohort study using archived data of Adult Protective Services (APS) substantiated cases of elder SN between January 1, 2004, and December 31, 2008.

SETTING: Houston, Harris County, Texas.

PARTICIPANTS: Adults aged 65 and older with APS region VI substantiated SN between January 1, 2004, and December 31, 2008 (N = 5,686).

MEASUREMENTS: Adult Protective Services caseworkers used the Client Assessment and Risk Evaluation (CARE) tool during home investigations, assessing risk of harm in the domains of living conditions, financial status, physical and medical status, mental health, and social connectedness. Latent class analysis was used to identify unique subtypes of elder SN.

RESULTS: Four unique subtypes of elder SN were identified, with approximately 50% of individuals manifesting physical and medical neglect problems. Other subtypes included environmental neglect (22%), global neglect (21%), and financial neglect (9%). Older age, Caucasian descent, and mental status problems were more strongly associated with global neglect behaviors. African Americans were more likely to experience financial and environmental neglect than Caucasians and non-white Hispanics.

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CONCLUSION: Elder SN consists of unique subtypes that may be amenable to customized multidisciplinary interventions. Future studies are needed to determine whether these subtypes impose differential mortality risks and whether multidisciplinary tailored interventions can reduce SN and prevent early mortality. *J Am Geriatr Soc* 62:1127–1132, 2014.

Key words: self-neglect; adult protective services; latent class analysis; medical neglect

The 2010 U.S. Census reported a drastic increase in adults aged 65 and older, who are likely to reach 20% of the total U.S. population by 2050. Unfortunately, a portion of this population will develop acute or chronic health conditions leaving them at risk of self-neglect (SN). Elder SN is the inability, due to physical or mental impairments or reduced capacity, to provide oneself with the necessary resources (e.g., food, medical services, shelter) to maintain physical health, mental health, and overall well-being.¹ Elder self-neglecters often live in isolation and squalor; refuse medical and social interventions; manifest marked declines in hygiene; and have untreated mental, physical, or medical conditions and excess mortality.^{2–7}

As a pervasive public health problem, elder SN is the most common allegation reported to Adult Protective Services (APS) nationwide.⁸ Since elder SN was first recognized in the 1950s, the study and theory has progressed, mostly over the last 10 years. It is now known that elder SN is most prevalent among the truly vulnerable: frail individuals, women, and minorities.^{9–13} It is time to upgrade our capacity to measure the incidence of this problem and its relationship to subtypes and associated risk factors amenable to therapeutic intervention and prevention.

The manifestations and severity of elder SN vary. Evidence suggests that higher levels of severity are associated with greater likelihood of hospitalization and early mortality.^{6,7,11} Certain subtypes of elder SN may put individuals more at risk of these negative outcomes. The first empirical support for further investigations into the

identification of elder SN subtypes was found in 2006; it was reported that some older adults neglect only their health, whereas others neglect multiple areas simultaneously.¹⁴ Better understanding of potential elder SN subtypes could identify unique biopsychosocial vulnerabilities that can be assessed in clinical settings and targeted using treatment and prevention programs to reduce the likelihood of poor outcomes.

The use of non-evidence-based severity cut-scores, small samples, and categorizations based on nonempirical data limited previous studies assessing elder SN subtypes.^{5,7,15} These limitations can lead to artificial and unreliable subtypes, clinical markers, and risk factors. Fortunately, there are well-established methodological approaches specifically designed to identify objective and reliable underlying subtypes, when they exist. The current study is the first to apply these advanced methodological approaches to an elder SN population and use a large cohort of elder SN substantiated cases to investigate the presence of subtypes with unique biopsychosocial profiles. Identifying individuals with different patterns of problems or conditions could help health professionals detect elder self-neglecters at greatest risk of early mortality and other negative health outcomes. Healthcare providers and protective services agencies can then target these conditions for remediation and preventive services when developing treatment plans for their patients and clients.

METHODS

Data Source

The Texas Department of Family and Protective Services, Division of Adult Protective Services, in Region VI, serving Harris County, provided archived electronic data. APS are state agencies charged with investigating and validating allegations of domestic abuse and neglect in community-living adults. Although SN may not manifest differently in adults aged 18 to 64 than in those aged 65 and older, for younger adults to be investigated as a self-neglector, Texas APS requires that they have a diagnosed or observed mental, physical, medical, or developmental disability that chronically diminishes their ability to provide self-care and protection. Anyone aged 65 and older with a reported allegation of SN, regardless of disability status, is investigated. Region VI is the second largest APS region in Texas and substantiated 11,280 cases of SN in adults aged 65 and older between January 1, 2004, and December 31, 2008. All cases received an in-home investigation and substantiation of elder SN by an APS caseworker using the Texas APS Client Assessment and Risk Evaluation (CARE) tool. The UT Health, Houston Center for the Protection of Human Subjects approved this study.

CARE Tool

The CARE tool was designed to improve the assessment and service delivery process for APS referrals. APS caseworkers receive 6 weeks of comprehensive classroom, field, and manual-based training on the state laws for substantiating mistreatment and SN, including administration of the CARE tool. Three of these weeks are spent in the

field directly observing the administration and coding of the CARE tool. The CARE tool proved robust when field tested on adults aged 60 and older and became a mandatory part of Texas APS investigations in August 2005.

The CARE tool contains 57 items associated with the different types of elder mistreatment and SN. These items are clustered into five broad categories (living conditions, social interaction, financial, physical and medical, and mental status), with 15 subcategories and unique risk indicators. Each risk indicator follows an ordinal scale of measurement, with available response options of no problem, managed risk, problem, severe problem, not applicable, and undetermined. Each level of risk has a descriptive phrase to help the assessor decide on its appropriateness for a given client. The identification of a problem or severe problem in any category indicates a validated allegation.¹⁶ Psychometric assessment of the CARE tool revealed good reliabilities, ranging from $\alpha = 0.78$ (physical and medical status) to $\alpha = 0.93$ (living conditions). The social, financial, and mental status constructs had reliabilities of $\alpha = 0.83$, $\alpha = 0.87$, and $\alpha = 0.89$, respectively. The CARE tool was also found to be measurement invariant across sex and ethnicity.¹⁷

Analytic Strategy

Data Screening and Descriptive Analysis

Client Assessment and Risk Evaluation tool items with a problem or severe problem were coded as 1, and those with no problem, managed risk, or not applicable were coded as 0. Undetermined items were coded as missing. Individuals with data on the CARE tool were included. The data were assessed for outliers, missing values, and violations of normality.¹⁸ In the latent class analysis, missing values for demographics and the CARE tool (items scored as undetermined) were addressed using full information maximum likelihood as implemented in Mplus version 6 (Muthén & Muthén, Los Angeles, CA). Standard descriptive statistics were used to characterize the sample demographic characteristics and the different combinations of SN. Post hoc exploratory analyses of latent class differences were assessed using Pearson chi-square and independent-sample *t*-tests.

Latent Class Analysis

Latent class analysis (LCA) is used to identify unobserved groups or subtypes of individuals that respond differently to a set of measured variables and have substantively different symptom profiles, behaviors, or diagnoses.^{19–21} LCA has been widely used in studies of behavioral risks and self-control, the identification of subtypes of adolescent depression, and adult criminal offending. Identification of subtypes can facilitate diagnostics and treatment plan development.^{19,20} Unlike previously applied methods, LCA accounts for measurement error and maximizes the use of participant data.

Latent class analysis allows for class estimation using categorical or binary data. A binary score of 0 (no problem) or 1 (problem) was calculated for each CARE tool domain if any of the indicators on that domain were

checked as present. A series of LCA models for elder SN were estimated. Class enumeration was performed by comparing models with one less class (C–1) against subsequent models (C) until a best-fitting model was identified using recommended criteria.²²

Model parameters and classes were estimated using the robust maximum likelihood (MLR) estimator in Mplus version 6. The MLR is robust to violations of normality commonly associated with categorical and binary data and thus increased the statistical conclusion validity of this analysis. Model differences were tested using the Lo-Mendell-Rueben (LMR) test and the Bootstrap Likelihood Ratio Test (BLRT), with good model fit indicated by $P < .05$.²² The Akaike Information Criterion (AIC) and the adjusted Bayesian Information Criterion (aBIC) were also used to guide class enumeration. Lower values for the AIC and aBIC indicate a better-fitting model. A model with a nonsignificant BLRT between the C and C–1 class models, as well as one that achieves a minimum aBIC, was sought.²² Entropy values closer to 1 are preferred and indicate better class separation. Class (subtype) proportions and conditional item probabilities were examined to aid class interpretation. Class interpretation should include practical knowledge to avoid reaching a solely statistical solution.

RESULTS

Three thousand seven hundred (33%) of the cases did not have CARE tool data and were excluded from the study, yielding a sample of 7,580 individuals aged 65 and older. Selecting only cases with elder SN resulted in a sample of 5,686 unduplicated cases. Table 1 lists the demographic characteristics of the overall elder SN sample according to SN subtype.

Table 2 provides the fit statistics for Models 1 through 4 because a five-class model did not converge, resulting in unstable parameter estimates consistent with model misspecification. The four-class model had the best fit and the highest level of separation and was interpretable with distinctive patterns and ample class sizes, so it was chosen as the best-fitting model for defining subtypes and was thus further interpreted.

Although there is overlap between the subtypes (entropy <1), distinct patterns emerged. Physical and medical neglect was the largest subtype, whereas there was a low probability (.28) of mental health neglect. Environmental neglect was the second largest subtype, with a high probability of individuals neglecting their living conditions (.77), followed by a .44 probability of physical and medical neglect. Global neglect, the third largest subtype, is characterized by individuals presenting with high probabilities of a problem in four domains rather than in a single domain. For instance, individuals in this subtype have a .84 probability of physical and medical neglect, a .78 probability of mental health neglect, a .61 probability of neglecting their living conditions, and a .42 probability of having social problems. The final subtype, financial neglect, had the smallest sample size. Figure 1 plots the probabilities of a positive response to each of the five CARE tool domains for the four subtypes and provides the percentages for each subtype.

Participants with different subtypes of neglect had different demographic characteristics. Individuals in the physical and medical neglect subtype were significantly more likely to be married and be in the “other” (undefined) demographic category. Participants in the global neglect subtype were more likely to be single, Caucasian, and older ($P < .01$). Half of the individuals in the financial neglect subtype were African American, as were 40.6% of those in the environmental neglect subtype. Individuals in

Table 1. Demographic Characteristics of Adults Aged 65 and Older with Texas Adult Protective Services Substantiated Self-Neglect According to Subtype of Self-Neglect (N = 5,686)

Characteristic	Study Sample, N = 5,686	Physical and Medical Neglect, n = 2,802	Environmental Neglect, n = 1,228	Global Neglect, n = 1,167	Financial Neglect, n = 489
Age, mean ± standard deviation	76.8 ± 7.7	77 ± 0.2	76.4 ± 0.2		74.0 ± 0.3
Sex, n (%)					
Female	3,615 (63.6)	1,824 (65.3)	769 (62.7)	706 (60.9)	315 (64.7)
Male	2,050 (36.1)	968 (34.7)	457 (37.3)	453 (39.1)	172 (35.3)
Race and ethnicity, n (%)					
African American	2,068 (36.4)	969 (42.1)	498 (47.5)	356 (35.4)	245 (58.5)
Caucasian	1,934 (34.0)	910 (39.5)	399 (38)	501 (49.9)	124 (29.6)
Hispanic	696 (12.2)	375 (16.3)	135 (12.9)	140 (13.9)	46 (11)
Other	988 (17.4)	548 (19.6)	195 (15.9)	170 (14.6)	74 (15.1)
Marital status, n (%)					
Married	1,276 (22.4)	696 (27.8)	267 (24.2)	212 (20.2)	101 (22.3)
Single	212 (3.7)	92 (3.3)	44 (4.0)	58 (5.5)	18 (4.0)
Divorced or widowed	1,563 (27.5)	744 (29.7)	347 (31.5)	327 (31.1)	145 (32.0)
Unknown	2,057 (36.2)	969 (38.7)	444 (40.3)	454 (43.2)	189 (41.7)
Type of self-neglect, n (%)					
Physical	4,032 (71)	1,932 (69.5)	1,078 (87.9)	637 (55.2)	384 (78.7)
Medical	289 (5.1)	235 (8.5)	6 (0.5)	38 (3.3)	10 (2.0)
Mental health	150 (2.6)	125 (4.5)	1 (0.1)	18 (1.6)	6 (1.2)
Multiple		487 (17.5)	142 (11.6)	461 (39.9)	88 (18.0)

Totals may not equal 100 because of missing data.

Table 2. Latent Class Model Comparisons

Number of Classes	AIC	BIC	aBIC	LMR	<i>P</i> -Value	BLRT	<i>P</i> -Value	Entropy
1	32,178.9	32,212.1	32,196.2					
2	31,613.5	31,686.6	31,651.7	566.5	<.001	577.4	<.001	0.510
3	31,469.8	31,582.8	31,528.8	152.7	<.001	155.7	<.001	0.428
4 ^a	31,413.0	31,565.9	31,492.8	67.5	<.001	68.8	<.001	0.60

^aBest fitting values across the four classes. The fifth latent class is not presented because it did not converge, which is consistent with model misspecification.

Model fit statistics: Lower values of the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and adjusted Bayesian Information Criterion (aBIC) indicate better fit.

The Lo-Mendell-Ruben (LMR) test and Bootstrap Likelihood Ratio Test (BLRT) are used to examine the hypothesis that the difference in model fit between the $k-1$ classes and k classes is significantly larger than what would be expected by chance. The null hypothesis for these tests is that the $k-1$ model fits. If the *P*-value indicates significance (<.05), then the null that the $k-1$ model fits is rejected, and the model with k classes is considered to have better fit to the underlying data; if the *P*-value is nonsignificant, then the model with the larger number of classes (k) does not fit the underlying data significantly better than the one with the smaller number of classes ($k-1$). Entropy values closer to 1 indicate better fit.

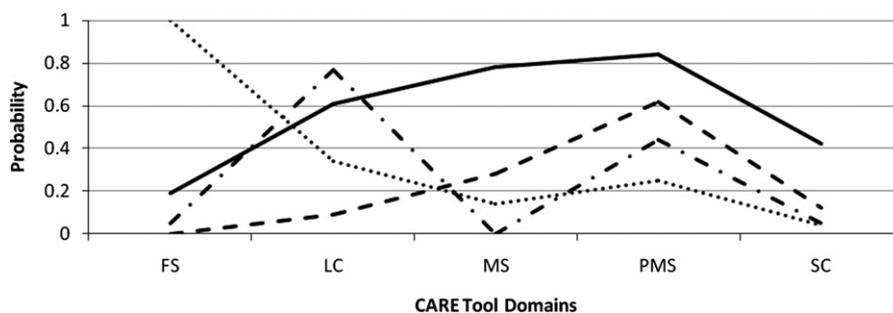


Figure 1. Probability plots for four self-neglect subtypes based on the five domains of the Texas Adult Protective Services Client Assessment and Risk Evaluation (CARE) tool: financial status (FS), living conditions (LC), mental status (MS), physical and medical status (PMS), and social connectedness (SC). Each of the lines shown in the graph reflects the unique pattern of responses on the CARE tool domains associated with subtype membership identified in the model. Probability values within a subtype are connected with lines to enhance interpretability and make it easier to identify the different patterns. Each line then reflects a common response pattern or profile for a specific subtype. For example, people who are determined to be members of the environmental neglect subtype would have almost no probability of reporting problems on financial status, mental status, and social connectedness, but they have a high likelihood of reporting problems with living conditions and physical and medical status.

the financial neglect subtype also had a lower mean age than the other three subtypes ($P < .01$). Sex and Hispanic ethnicity did not differ significantly between the subtypes.

DISCUSSION

This study identified four subtypes of elder SN (financial, environmental, global, and physical and medical), with unique characteristics that may be targeted using intervention and prevention programs. Prior research suggests a close association between SN and mental health problems (e.g., depression, dementia).^{4,23} Of considerable interest is the finding that mental health problems were not consistent across the subtypes, so using those conditions as a screen for elder SN in the clinic may not be highly sensitive and specific. Impaired activities of daily living, medication administration, and untreated medical conditions are strongly linked to the SN types and therefore may point to important indicators of elder SN even in the absence of mental health problems.

Because 50% of the cases fall into the physical and medical neglect subtype, APS should consider

developing multidisciplinary teams including their local geriatrics-trained physicians to ensure timely and sufficient care for these clients to reduce negative health outcomes. More-detailed, hypothesis-driven risk factor studies are needed to identify the best targets for intervention, early detection, and prevention services.

Few mental health problems in the physical and medical neglect subtype indicate that physical and medical interventions may be effective in helping many self-neglecters maintain independence in the community. Healthcare professionals should make referrals for rehabilitative therapies, assistive devices, and personal care assistance in individuals found to be experiencing physical and medical neglect. Furthermore, supporting self-neglecters in managing their medical problems, perhaps through home visits for medication administration, medication monitoring, or wound dressing changes, may be enough to abate the SN.

Some of these therapies may improve the situations of individuals experiencing the environmental neglect subtype. Clutter and risk of falls were the most common type of living condition problem. Furthermore, physical impairment and untreated medical conditions limited individuals in this

group. It is possible that clutter led to unsanitary conditions and an environment that increases health risks for the older adult; dehydration may result from nonfunctional plumbing, or chronic lower extremity wounds could be the result of a home so cluttered that there is no place for the self-neglector to lie down to sleep. Alternatively, health problems could be the cause of environmental disarray. Longitudinal, qualitative, and retrospective studies of APS cases could provide directionality for the circumstances and factors to be targeted for remediation and prevention.

It is likely that the global neglect subtype poses the greatest time and resource burden to social and healthcare services because of its complexity; it is also plausible that individuals experiencing global neglect are likely to have higher mortality, lower physiological reserve, and poorer quality of life. There is a lack of evidence-based interventions for SN, but the best intervention would most likely be deployment of a multidisciplinary team of medical and social work professionals, because the high probability of mental health problems in this group previously associated with nondifferentiated SN.^{23–25} It may be worth APS and healthcare professionals focusing on mental health problems to reduce SN in other areas. Brief behavioral activation or problem-solving therapy interventions may be effective for reducing some of the mood-related mental health problems commonly associated with elder SN. This may lead to less SN and better quality of life.^{26,27}

Although there is no APS-recognized category for financial neglect, several studies have shown that low income and financial burdens can lead to SN.^{7,9,28} Individuals experiencing this subtype had financial management problems brought on by their actions or the actions of a financial manager. This could have resulted in financial strain and the inability to afford basic needs such as utilities. Thus, this group may reflect a circumstance of financial exploitation by others. Recent evidence identifies elder SN as a risk factor for subsequent financial exploitation.²⁹ Finally, they may have been unable to afford certain necessities as a result of spending their money prudently on medical conditions as suggested by a .25 probability of physical and medical neglect.

Despite the large sample size drawn from an ethnically and racially diverse metropolitan city, it is possible that these findings will not generalize to other elder SN populations in more-rural areas or in counties and states where different definitions and reporting standards for elder SN exist. More studies are needed to validate these findings using covariates. Furthermore, standardized and comprehensive assessments were not included in the APS CARE tool, which might have facilitated the development of more-reliable risk factor profiles.

In conclusion, this article provides evidence supporting the notion of elder SN subtypes and identifies potential targets for intervention and prevention programs. The fact that most subtypes had at least two problem areas worth considering lends support to the need for multidisciplinary approaches.

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