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Original Study

Residential Relocations Among Older People Over the Course of More Than 10 Years

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A B S T R A C T

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Objective: The objective of this study was to describe the rates of residential relocations over the course of 10.5 years and evaluate differences in these relocation rates according to gender and decedent status.

Design: Prospective, longitudinal study with monthly telephone follow-up for up to 126 months.

Setting: Greater New Haven, CT.

Participants: There were 754 participants, aged 70 years or older, who were initially community-living and nondisabled in their basic activities of daily living.

Measurements: Residential location was assessed during monthly interviews and included community, assisted living facility, and nursing home. A residential relocation was defined as a change of residential location for at least 1 week and included relocations within (eg, community-community) or between (community- assisted living) locations. We calculated the rates of relocations per 1000 patient-months and evaluated differences by gender and decedent status.

Results: Sixty-six percent of participants had at least one residential relocation (range 0–12). Women had lower rates of relocations from nursing home to community (rate ratio [RR] 0.59, $P = .02$); otherwise, there were no gender differences. Decedents had higher rates of relocation from community to assisted living (RR 1.71, $P = .002$), from community to nursing home (RR 3.64, $P < .001$), between assisted living facilities (RR 3.65, $P < .001$), and from assisted living to nursing home (RR 2.5, $P < .001$). In decedents, relocations from community to nursing home (RR 3.58, $P < .001$) and from assisted living to nursing home (RR 3.3, $P < .001$) were most often observed in the last year of life.

Conclusions: Most older people relocated at least once during 10.5 years of follow-up. Women had lower rates of relocation from nursing home to community. Decedents were more likely to relocate to a residential location providing a higher level of assistance, compared with nondecedents. Residential relocations were most common in the last year of life.

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The rate of residential relocations among older adults varies from about 9% to 40%.¹ The variability in rate is mostly attributable to differences in definition, duration, and frequency of assessment.

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Further, declines in health are often considered an important predictor or precipitant for residential relocations, especially those to institutionalized settings.^{2,3} Nevertheless, only 20% of older persons indicate that the sole reason for relocation is a deterioration in health.⁴ Other important factors linked to residential relocation include feelings of safety, financial situation, well-being, and closeness to relatives.^{5,6}

Although it is well-documented that residential relocations are common, several questions remain unsettled. For instance, little is known about gender differences for residential relocations in late life. In the United States, more than two-thirds of residents in assisted living facilities⁷ and nursing homes⁸ are women. This could be because women outlive men by 5 years,⁹ or because women have a

higher rate of disability in activities of daily living (ADLs),^{10,11} and, consequently, are more often institutionalized. Data on gender-specific patterns and frequencies of residential relocations are lacking, and most studies on residential relocations have included long follow-up intervals (eg, 1 year), thereby overlooking short-term relocations (eg, following hospital admission).

If residential relocations are driven largely by a decline in health, one might expect that they would be more common in those before death (hereafter referred to as decedents) than those surviving over a decade of observations (hereafter referred to as nondecedents), but this has not been previously investigated. Prior reports have focused primarily on care transitions (eg, admission to the hospital, nursing home admission) in the last year of life.¹²

Using data from a unique longitudinal study that includes monthly assessments for up to 10.5 years, we set out to describe the rate of residential relocations and time to first relocation in a cohort of initially nondisabled community-dwelling older persons. We were particularly interested in evaluating differences in these relocations between men and women and between decedents and nondecedents.

Methods

Study Population

Participants were members of the Precipitating Events Project, a longitudinal study of 754 persons aged 70 years or older who were initially community-living and nondisabled in 4 basic ADLs (bathing, dressing, walking inside the house, and transferring from a chair). All participants lived in the greater New Haven area, CT. Exclusion criteria included significant cognitive impairment with no available proxy, inability to speak English, diagnosis of a terminal illness with a life expectancy of less than 12 months, and a plan to move out of the New Haven area during the next 12 months.

The assembly of the cohort, which took place between March 1998 and October 1999, has been described in detail elsewhere.^{13,14} In brief, potential participants were identified from a computerized list of 3157 age-eligible members of a large health plan in greater New Haven, CT. Eligibility was determined during a screening telephone interview and was confirmed during an in-home assessment. Only 4.6% of the 2573 health plan members who were alive and could be contacted refused to complete the telephone interview, and 75.2% of those found to be eligible agreed to participate in the study. Persons who refused to participate did not differ significantly from those included according to gender and age. The study protocol was approved by the Yale Human Investigation Committee, and all participants provided verbal informed consent.

Data Collection

A comprehensive, in-home assessment was conducted at baseline. Telephone interviews were completed monthly through 2009, with a completion rate of more than 99%. For participants with significant cognitive impairment, the monthly interviews and relevant parts of the comprehensive assessment were completed with a designated proxy. Deaths were ascertained by review of local obituaries and/or from an informant during a subsequent telephone interview, with a completion rate of 100%.¹⁵

Baseline In-Home Assessment

During the comprehensive baseline assessment, data were collected on demographic characteristics, including age, gender, race (non-Hispanic white versus other), educational status, current

marital status, and living situation (alone versus with others). Physician-diagnosed chronic conditions, assessed by self-report, included hypertension, myocardial infarction, congestive heart failure, stroke, diabetes mellitus, arthritis, hip fracture, chronic lung disease, and cancer. Cognitive status was assessed with the Folstein Mini-Mental State Examination (MMSE).¹⁶ Based on the number of correct responses, the MMSE provides a total score, ranging from 0 to 30, with a score less than 24 denoting cognitive impairment. Self-rated health was assessed on a 5-item scale ranging from excellent to poor. Depressive symptoms were assessed by the 11-item version of the Center for Epidemiologic Studies Depression (CES-D) Scale.¹⁷ Scores for this shortened version were transformed to correspond to the standard 20-item scale. A score of 16 or higher indicates depressive symptoms.

Assessment of Residential Location

Residential location was ascertained at baseline and subsequently every month during the telephone interview for 10.5 years or until death. We focused on 3 residential locations: community, assisted living facility, and nursing home. Community included houses, apartments, and non-age-restricted apartments. Assisted living was defined according to the definition provided by the Assisted-Living Quality Coalition,¹⁸ a congregate residential setting that provides or coordinates personal services, 24-hour supervision and assistance, activities, and health-related services. Age-restricted living facilities were included in this definition. Nursing home included subacute care and long-term care facilities. Because of the infrequent occurrence, an admission to a hospice inpatient facility was also classified as nursing home care.

Participants were asked whether they had been in an assisted living facility or nursing home during the past month or if they had moved to another location in the past month. At the end of each telephone interview, participants were asked if they expected to remain at the same residential location the following month. This would often prompt the participant to reveal plans for relocation. For participants who indicated that they were admitted to a nursing home during the past month, the interviewer verified whether the participant was currently in a nursing home. The accuracy of this information was almost perfect, with kappa = 0.96.¹⁵

Definition of Residential Relocation

Relocation was defined as a move, lasting more than 1 week, from one's current residential location to another residential location. This included the same type of residential location (eg, participant moved between community settings) or a different type of residential location (eg, from community to assisted living). Because of the large number of possible permutations, relocation types were collapsed first by the same type patterns (eg, community to community was classified as "community") and then by each relocation type repetition (nursing home to assisted living to nursing home to assisted living is classified as "nursing home to assisted living").

Statistical Analysis

Data were summarized as means and SDs for continuous variables and counts with percentages for categorical data. We compared the baseline characteristics of participants by gender and decedent status, using *t*-tests to evaluate differences in means, Wilcoxon rank-sum test for non-normal measures, and chi-square tests to evaluate differences in percentages. We calculated the frequency distributions of the possible relocation patterns along with rates (per 1000 person-months) for each type of relocation (from one residential type to

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