

## Research Article

# Predictors of American elders' home stay: A secondary data analysis study

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### Abstract

The purpose of this study was to identify the predictors of home stay for American elders. This study used a cross-sectional, descriptive, secondary data analysis design. The National Home and Hospice Care Survey 2000 (NHHCS 2000) public-use data files were used for this study. The sample included 9879 elders who were listed as either current or discharged patients from the NHHCS 2000. Based on multiple logistic regression analysis, the most predictive variable for an elder's home stay was whether the elder was currently living with family members. The overall model of 16 predictors was statistically significant in distinguishing between "home stay" and "not home stay" elders. The model correctly predicted 92.0% of the elderly participants regarding the home stay outcome. Health-care professionals could target these predictors in an attempt to develop interventions that assist elders to reside in their own home.

### Key words

aged, gerontology, living arrangements, logistic regression, older adults, secondary data analysis.

## INTRODUCTION

Population aging affects individuals, families, businesses, health-care providers, and policy-makers. By 2030, it is projected that there will be 72 million older adults in the USA compared to 35 million in 2000 (Marek *et al.*, 2005; National Institute on Aging/US Census Bureau, 2005). With an increasingly aging population, health-care professionals need to be aware of the implications of increased demands on health-care and social systems, especially long-term care.

Countries emphasizing home-based care are the ones most concerned with quality of life, as well as the economical benefits of elders' home stay (Hussein & Manthorpe, 2005). Internationally, the current literature suggests that elders who live at their private residence, including those who have serious physical illnesses or cognitive impairments, continue to have a higher quality of life, longer life expectancy, and lower health-care-related costs than those who reside in nursing home facilities (National Alzheimer's Association, 2001; Tseng & Wang, 2001; Jordhey *et al.*, 2003; Scooco *et al.*, 2006). A study by Marek *et al.* (2005) compared the clinical outcomes of a community-based elder care program, namely *Aging in Place*, to the traditional nursing home institutionalization. The findings were supportive of community-based

care, as the *Aging in Place* study group has better outcomes than the nursing home group did with regard to activities of daily living, cognition, depression, and incontinence. These existing studies provide evidence that home stay, with adequate community-based health-care services, might provide more favorable health outcomes and a better quality of life for elders. Thus, the argument for determining the most influential factors of home stay is strengthened.

The purpose of this study was to identify the predictors of home stay for American elders because home care is associated with more positive health outcomes among the elderly population. The specific aim for this study was to provide empirical evidence by identifying the factors that might serve as useful predictors for elders' home stay. Demographic characteristics, physical health status, functional abilities, and socioeconomic status were hypothesized to be useful predictors for American elders to stay in their private residence instead of utilizing institutionalized care settings.

## LITERATURE REVIEW

One of the research priorities in the elderly population is to maximize independence and enable elders to have the option of residing in their home and utilizing community-based services rather than moving to institutionalized care settings (National Institute on Aging, 2004). Based on a review of the literature, the following factors were found to play an important role in elders' living arrangements: health status, socioeconomic status, and access to health-care services.

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### Health status

Approximately 80% of elders have at least one chronic health condition and 50% have at least two (Center on an Aging Society, Georgetown University, 2003; National Institute on Aging/US Census Bureau, 2005). Chronic health conditions frequently lead to activity limitations and increased care needs (Center on an Aging Society, Georgetown University, 2005). Increased frailty and dependency, associated with many chronic conditions, are major reasons for families to place their relatives into aged care facilities (Cheek & Ballantyne, 2001).

Elders with mental illness are less likely to reside at their private home (Lee *et al.*, 2001; Wright *et al.*, 2001; Alcock *et al.*, 2002), with dementia being the most common diagnosis affecting an older adult's place of residence (Wright *et al.*, 2001). In addition, Castle (2001) found that persons with mental health conditions, confusion or brain dysfunction are more likely to relocate and move out of their private residence. The factors in another study that affected family caregivers' decisions to place their relatives with dementia into residential care were incontinence, physical dependency, wandering behavior, verbal aggression, physical aggression, difficulty in communication, and confusion-related stress (Armstrong, 2001).

### Socioeconomic status

Previous research has suggested that the involvement of family members providing unpaid care increases the likelihood of elders' home stay (Alcock *et al.*, 2002; Feinburg & Newman, 2004). The literature also suggested that those with supportive networks are less likely to need inpatient acute care, which is a common pathway to nursing home placement (Cheek *et al.*, 2005). However, there is an increasing shortage of informal caregivers due to factors such as the increasing participation by women in the workforce, with the resulting lack of time and energy to provide care for older family members (Hussein & Manthorpe, 2005).

Having sufficient funds increases the chance of elders residing at their private residence (Alcock *et al.*, 2002). The chances of staying at home also increase if the primary family caregiver relies on the older adult's income, usually a pension. Elders with lower income and education also appear to have greater functional loss in daily living activities (Schoeni *et al.*, 2005). As a result, elders with lower income and less education are less likely to stay at home.

### Access to health-care services

A recent study suggested that consistent access to a primary care physician is a significant factor in preventing physical decline, thus increasing the likelihood of elders' home stay (Cheek *et al.*, 2005). Primary care physicians, who have a broad knowledge of the services available to the elderly, can provide continuity of geriatric care. Transportation affects older adults' ability to access health care, as well as their chance of home stay. This is an increasingly significant problem for elders living in rural areas (Alcock *et al.*, 2002).

In addition to access to health-care services, the availability of community-based services affects older adults' ability to stay at home (Chapman *et al.*, 2003). For example, elders who receive help with regular visiting, home repairs, snow removal, deep cleaning, and yard maintenance are more likely to stay at their private residence (Weeks *et al.*, 2005).

## METHOD

### Design

This study used a cross-sectional, descriptive, secondary data analysis design. The National Home and Hospice Care Survey 2000 (NHHCS, 2000) public-use microdata files were used for this study. This survey is a continuing series of surveys of home care and hospice care agencies in the USA (National Center for Health Statistics, 2004a). Home care agencies are defined as agencies that provide care for individuals and families in their place of residence for the purposes of promoting, maintaining, and restoring health or maximizing the level of independence while minimizing the effects of disability and illness, including terminal illness. Hospice care agencies provide physical, psychological, social, and spiritual care for dying persons, their families, and significant others.

### Sample

The sampling frame for the NHHCS 2000 consisted of 15 451 home health and hospice care agencies that were obtained from various national organizations and other sources (National Center for Health Statistics, 2004b). The sampling design for the NHHCS 2000 was a stratified, two-stage probability design. Current and discharged patients were selected from lists constructed for each agency at the time of the interview. The current patients were defined as those patients who were on the rolls of the agency as of midnight on the day immediately before the date of the survey. The discharged patients described those who were discharged from care by the home health agency or hospice during a designated month between October 1999 and September 2000. The NHHCS data were collected through personal interviews with administrators and staff of the selected home and hospice care agencies. No patient was interviewed directly.

This secondary data analysis study included the NHHCS 2000 data regarding 7159 patients from the current patient data file and 6273 patients from the discharged patient data file. The patients were excluded from this study if they were < 65 years old in order to maintain a relatively homogeneous sample of American elders. After applying this exclusion criterion, the final sample size for this study was 9879 elders.

The NHHCS 2000 was conducted after obtaining Institutional Review Board approval and Office of Budget and Management clearance (B. Han, pers. comm., 2005). This secondary data analysis study was conducted after obtaining approval from the Institutional Review Board of the University of Tennessee, Knoxville, USA.

## Dependent variable

Based on the purpose of this study, an outcome variable of home stay was generated from the survey question that asked, "Where was the patient living?" According to the NHHCS 2000 flashcard booklet (National Center for Health Statistics, 2004c), the specifications for each residential response were as follows: (i) a private residence is a house or apartment, rented or owned; (ii) a rented room or boarding house is a room or boarding house open to anyone, as defined by the landlord, for rental payment; (iii) a retirement home is a retirement facility that provides room and board to elderly or impaired persons and often includes a separate hospice wing or unit that provides nursing, medical, and personal care to those needing it; (iv) an assisted living or residential care facility is a facility that has three beds or more and provides personal care or supervision to its residents, such as help with bathing, dressing, eating, walking, shopping or corresponding. It includes group homes, rest homes, congregate living, and adult foster care; (v) another type of inpatient health facility includes nursing homes, hospitals, mental health facilities, and other inpatient health facilities and provides lodging, board, and social and physical care; and (vi) other. The elderly participants were categorized as "home stay" elders if they selected the first two residential choices; all other participants were then categorized as "not home stay" elders.

## Independent variables

Based on the review of the literature and the availability of existing data sources, 49 independent variables were selected as potential predictors for American elders' home stay. These variables represented demographic characteristics, socioeconomic status, functional abilities, physical health, and elders' use of aids or special devices.

The four selected demographic variables were gender, age, marital status, and race. The four socioeconomic variables indicated whether the participant was living with family members, whether the participant was living alone, whether the participant had a primary caregiver outside of the agency, and whether governmental medical assistance was the primary source of payment for home or hospice care.

Twelve variables were included in the study to measure the participants' functional abilities for daily living activities. The data indicated whether the participants received personal help from participating home health-care agencies or hospice care agencies during the past 30 days in any of the following activities: bathing or showering, dressing, eating, transferring in or out of beds or chairs, walking, using the toilet room, doing light housework, managing money, shopping for groceries or clothing, using the telephone (dialing or receiving calls), preparing meals, and taking medications.

Six variables were used to measure the participants' physical health. The data indicated whether participants had any difficulty in seeing (when wearing glasses), hearing (when wearing a hearing aid), controlling their bladder, controlling their bowels, whether they had an indwelling urinary catheter or urostomy, and whether they had a colostomy or ileostomy.

The largest number of independent variables measured the elders' use of aids or special devices. A total of 23 items were

included in this category. The data indicated whether the participants used any aids regularly during the last 30 days. This question was followed by a list of 22 aids or special devices. The listed aids or special devices included: bedside commode, blood glucose monitor, cane or crutches, dentures, elevated toilet seat, enteral feeding equipment, eyeglasses, Geri-chair, grab bars, hearing aid, hospital bed, IV therapy equipment, special mattress, orthotics or braces, over-bed table, oxygen respiratory therapy equipment, other respiratory therapy equipment, shower chair or bath bench, transfer equipment, walker, manually operated wheelchair, and motorized wheelchair.

The demographic variables were recoded dichotomously to simplify the interpretation of the statistical results. The reverse coding technique was used for the variables measuring the elders' functional ability, physical health, and the use of aids or special devices. According to the literature, decreasing health and functional abilities were the major reasons for older adults needing residential care (Neufeld *et al.*, 2004). These findings could imply that the more assistance that the elderly participants received from a home or hospice care agency, the lower the participants' functional abilities and the lower the chance of staying at home.

## RESULTS

### Demographic data

The sample for this secondary data analysis study included 9879 elders aged  $\geq 65$  years who were listed as either current or discharged patients from the NHHCS 2000. Table 1 provides the demographic characteristics of the study's

**Table 1.** Demographic data of the research participants ( $n = 9879$ )

Variable	N	%
Gender		
Male	3575	36.2
Female	6304	63.8
Age (years; mean = 80.05, SD = 8.1, range = 65–111)		
65–74	2698	27.3
75–84	4102	41.5
$\geq 85$	3079	31.2
Marital Status		
Married	3659	37.0
Widowed	4482	45.4
Divorced	424	4.3
Separated	29	0.3
Never married	93	1.0
Single	488	4.9
Don't know	704	7.1
Race		
American Indian or Alaskan Native	70	0.7
Asian	71	0.7
African American	800	8.1
Native Hawaiian or Pacific Islander	18	0.2
Caucasian American	8301	84.0
Other or don't know	619	6.3

**Table 2.** Comparison of home stay and not home stay elders regarding demographic characteristics ( $n = 9879$ )

Variable†	Home stay N (%)	Not home stay N (%)	$\chi^2$
Gender			37.8*
Male	2957 (82.7)	618 (17.3)	
Female	4886 (77.5)	1418 (22.5)	
< 80 years old (mean age = 80.05 years)			200.5*
Yes	4034 (85.4)	689 (14.6)	
No or don't know	3809 (73.9)	1347 (26.1)	
Married			246.9*
Yes	3210 (87.7)	449 (12.3)	
No or don't know	4633 (74.5)	1587 (25.5)	
Caucasian American			17.3*
Yes	6529 (78.7)	1772 (21.3)	
No or don't know	1314 (83.3)	264 (16.7)	

\* $P < 0.0001$ . †The demographic variables were recoded dichotomously to simplify the interpretation of the statistical results.

participants. The majority of the participants were Caucasian Americans (84%,  $n = 8301$ ), female (63.8%,  $n = 6304$ ), and either widowed (45.4%,  $n = 4482$ ) or married (37.0%,  $n = 3659$ ). The mean age of the participants was 80.05 years ( $SD = 8.1$ , range = 65–111). In this study, 79.4% of the elderly participants ( $n = 7843$ ) were categorized as home stay elders as they were living at their private residence, rented room or boarding house. All of the other participants were categorized as not home stay elders (20.6%,  $n = 2036$ ) as they were living at a retirement facility, assisted living or residential care facility or other type of inpatient health facility.

### Univariate analyses

Chi-squared tests of independence were used to compare the frequency of the categories within each independent variable with regard to elders' home stay. The assumptions needed to use the  $\chi^2$  test were met: the expected frequencies for each category were at least 1 and  $\leq 20\%$  of the categories had expected frequencies of  $< 5$  (Pyrzszak, 2006). As a result of the use of multiple statistical tests, the alpha level for the inferential tests was set at 0.01.

All of the 49 independent variables, as described earlier, were used in the  $\chi^2$  testing. Tables 2–6 summarize the results of the  $\chi^2$  tests. According to the results, 34 independent variables were independently associated with the elders' home stay.

### Multiple logistic regression analysis

The 34 variables with a significant influence ( $P < 0.01$ ) on the univariate analyses were further studied in a multiple logistic regression model. As logistic regression analysis is very sensitive to high correlations among predictor variables and outliers (Mertler & Vannatta, 2005), a preliminary multiple regression analysis was conducted to calculate the Mahalano-

**Table 3.** Comparison of home stay and not home stay elders regarding socioeconomic status ( $n = 9879$ )

Variable	Home stay N (%)	Not home stay N (%)	$\chi^2$
Living with family members			2636.3*
Yes	5255 (98.7)	68 (1.3)	
No or don't know	2588 (56.8)	1968 (43.2)	
Living alone			120.5*
Yes	2157 (87.1)	319 (12.9)	
No or don't know	5686 (76.8)	1717 (23.2)	
Having a primary caregiver			26.7*
Yes	6712 (80.3)	1648 (19.7)	
No or don't know	1131 (74.5)	388 (25.5)	
Primary source of payment for home or hospice care			2.1
Government funds	6910 (79.6)	1770 (20.4)	
Other or don't know	933 (77.8)	266 (22.2)	

\* $P < 0.0001$ .

bis distance to examine multicollinearity and to identify outliers. The tolerance for all of the 34 independent variables was  $> 0.1$ , indicating that multicollinearity was not a problem. The participants who had a Mahalanobis distance greater than the critical value,  $\chi^2 (34) = 65.247$  at  $P = 0.001$ , were eliminated as outliers, resulting in the inclusion of 9414 participants in the multiple logistic regression analysis. The multiple logistic regression analysis was conducted using a forward method of entry to determine which of the 34 pre-screened independent variables were significant predictors of elders' home stay. The forward-stepping method was utilized as this research was exploratory in nature. Table 7 presents the coefficients of the logistic regression model.

No significant relationship was found in 18 independent variables, which were then eliminated from the multiple logistic regression analysis. According to the findings from the multiple logistic regression analysis, the overall model of the remaining 16 predictors was statistically significant in distinguishing between the home stay and not home stay elders ( $n = 9414$ ,  $\chi^2 (15) = 5351.5$ ,  $P < 0.0001$ ,  $-2 \log$  likelihood = 4051.2). The overall logistic regression model proved to be a successful predictive equation for elders' home stay (Cox and Snell  $R^2 = 0.43$ , Nagelkerke  $R^2 = 0.68$ ). The overall model correctly predicted the residence likelihood for 92.0% of the elderly participants. The model correctly predicted 95.4% of the elderly participants who were more likely to stay at home and correctly predicted 78.4% of the participants who were less likely to stay at home.

### Predictors of American elders' home stay

Living with family members was the most predictive variable for the home stay outcome among the research participants who were home health or hospice care patients. According to the regression model, the elderly participants who were currently living with family members were 300-fold more likely

**Table 4.** Comparison of home stay and not home stay elders regarding functional abilities ( $n = 9879$ )†

Variable	Home stay N (%)	Not home stay N (%)	$\chi^2$
Bathing or showering			29.9**
Yes	4309 (77.4)	1256 (22.6)	
No or don't know	3534 (81.9)	780 (18.1)	
Dressing			40.9**
Yes	3802 (76.8)	1149 (23.2)	
No or don't know	4041 (82.0)	887 (18.0)	
Eating			376.6**
Yes	1149 (62.8)	680 (37.2)	
No or don't know	6694 (83.2)	1356 (16.8)	
Transferring in or out of beds or chairs			28.3**
Yes	3047 (76.8)	923 (23.2)	
No or don't know	4796 (81.2)	1113 (18.8)	
Walking			10.4*
Yes	2654 (81.3)	612 (18.7)	
No or don't know	5189 (78.5)	1424 (21.5)	
Using the toilet room			22.3**
Yes	2230 (76.4)	688 (23.6)	
No or don't know	5613 (80.6)	1348 (19.4)	
Doing light housework			96.2**
Yes	2451 (85.6)	411 (14.4)	
No or don't know	5392 (76.8)	1625 (23.2)	
Managing money			0.1
Yes	113 (79.0)	30 (21.0)	
No or don't know	7730 (79.4)	2006 (20.6)	
Shopping for groceries or clothes			17.0**
Yes	682 (85.0)	120 (15.0)	
No or don't know	7161 (78.9)	1916 (21.1)	
Using the telephone			25.3**
Yes	236 (68.6)	108 (31.4)	
No or don't know	7607 (79.8)	1928 (20.2)	
Preparing meals			47.5**
Yes	1310 (86.0)	214 (14.0)	
No or don't know	6533 (78.2)	1822 (21.8)	
Taking medications			44.5**
Yes	2331 (75.1)	706 (24.9)	
No or don't know	5712 (81.1)	1330 (18.9)	
Total	7843 (79.4)	2036 (20.6)	

\* $P < 0.001$ ; \*\* $P < 0.0001$ . †Question to the participants: During the last 30 days, did the participant receive personal help from the home or hospice care agency in the following activities?

to stay at home than those who were not living with family members (odds ratio [OR] = 348.5,  $P = 0.0001$ ).

Additional significant predictors for home stay among elderly home or hospice care patients were: < 80 years old (OR = 1.6,  $P = 0.0001$ ), currently married (OR = 0.4,  $P = 0.0001$ ), not living alone (OR = 0.7,  $P = 0.0001$ ), having a primary caregiver (OR = 1.4,  $P = 0.01$ ), not receiving an agency's help for eating (OR = 1.7,  $P = 0.0001$ ), not receiving an agency's help for light housework (OR = 0.7,  $P = 0.001$ ), having no difficulty in controlling the bladder (OR = 1.4,  $P = 0.002$ ), having no difficulty in controlling the bowels (OR = 1.4,  $P = 0.004$ ), not regularly using aids or special

**Table 5.** Comparison of home stay and not home stay elders regarding physical health ( $n = 9879$ )

Variable	Home stay N (%)	Not home stay N (%)	$\chi^2$
Having difficulty in seeing (when wearing glasses)			1.8
Yes	2034 (78.5)	558 (21.5)	
No or don't know	5809 (79.7)	1478 (20.3)	
Having difficulty in hearing (when wearing a hearing aid)			0.6
Yes	2014 (78.9)	540 (21.1)	
No or don't know	5829 (79.6)	1496 (20.4)	
Having difficulty in controlling the bladder			185.1*
Yes	2054 (70.8)	847 (29.2)	
No or don't know	5789 (83.0)	1189 (17.0)	
Having difficulty in controlling the bowels			516.5*
Yes	1515 (63.1)	877 (36.9)	
No or don't know	6328 (84.6)	1149 (15.4)	
Having an indwelling urinary catheter			105.4*
Yes	1091 (69.8)	473 (30.2)	
No or don't know	6752 (81.2)	1563 (18.8)	
Having a colostomy or ileostomy			0.9
Yes	378 (81.1)	88 (18.9)	
No or don't know	7465 (79.3)	1948 (20.7)	

\* $P < 0.0001$ .

devices, such as a bedside commode (OR = 0.4,  $P = 0.0001$ ), cane or crutches (OR = 0.7,  $P = 0.0001$ ), grab bars (OR = 2.9,  $P = 0.0001$ ), hospital bed (OR = 1.5,  $P = 0.0001$ ), over-bed table (OR = 2.4,  $P = 0.0001$ ), walker (OR = 0.7,  $P = 0.001$ ) or manually operated wheelchair (OR = 1.4,  $P = 0.002$ ).

## DISCUSSION

The study's findings are congruent with the literature that suggests elders' health status and functional abilities are associated with the home stay outcome (Neufeld *et al.*, 2004). For example, two predictors in the logistic regression model are related to the elders' functional abilities; namely, receiving help for eating and receiving help for light housework. In addition, the regression model supports the literature that indicates that incontinence and physical dependency are the factors affecting family caregivers' decisions to place their relatives into residential care facilities (Armstrong, 2001). In this regression model, having no difficulty in controlling the bladder and having no difficulty in controlling the bowels predict elders' home stay. Physical dependency is implied by elders' use of aids or special devices. This regression model identifies seven aids and devices that are predictive of elders' home stay, including elders' use of a bedside commode, cane or crutches, grab bars, hospital bed, over-bed table, walker or manually operated wheelchair.

**Table 6.** Comparison of home stay and not home stay elders regarding the use of aids or devices ( $n = 9879$ )<sup>†</sup>

Variable‡	Home stay N (%)	Not home stay N (%)	$\chi^2$
Bedside commode			37.5*
Yes	2036 (83.8)	395 (16.2)	
No or don't know	5807 (78.0)	1641 (22.0)	
Blood glucose monitor			16.5*
Yes	582 (85.5)	99 (14.5)	
No or don't know	7261 (78.9)	1937 (21.1)	
Cane or crutches			171.1*
Yes	1714 (90.3)	184 (9.7)	
No or don't know	6129 (76.8)	1852 (23.2)	
Eyeglasses			53.5*
Yes	3487 (82.8)	722 (17.2)	
No or don't know	4356 (76.8)	1314 (23.2)	
Geri-chair			236.9*
Yes	252 (51.9)	234 (48.1)	
No or don't know	7591 (80.8)	1802 (19.2)	
Grab bars			59.7*
Yes	759 (70.4)	319 (29.6)	
No or don't know	7084 (80.5)	1717 (19.5)	
Hospital bed			546.1*
Yes	2157 (65.9)	1117 (34.1)	
No or don't know	5686 (86.1)	919 (13.9)	
Special mattress			321.1*
Yes	941 (62.2)	571 (37.8)	
No or don't know	6902 (82.5)	1465 (17.5)	
Over-bed table			660.0*
Yes	717 (53.1)	633 (46.9)	
No or don't know	7126 (83.6)	1403 (16.4)	
Oxygen respiratory equipment			64.0*
Yes	1800 (73.7)	642 (26.3)	
No or don't know	6043 (81.3)	1394 (18.7)	
Transfer equipment			13.7*
Yes	372 (72.9)	138 (27.1)	
No or don't know	7471 (79.7)	1898 (20.3)	
Walker			204.1*
Yes	3373 (86.6)	522 (13.4)	
No or don't know	4470 (74.7)	1514 (25.3)	
Manually operated wheelchair			69.1*
Yes	2221 (74.3)	770 (25.7)	
No or don't know	5622 (81.6)	1266 (18.4)	

\* $P < 0.0001$ . †Question to the participants: During the last 30 days, which of these aids or special devices did the participant regularly use?; ‡only the variables with statistical significance were reported here.

The clinical significance of the study is demonstrated by the finding of 16 predictors of elders' home stay. These predictors mirror the common causes for utilizing institutionalized care settings, such as older in age, a lack of social support, safety concerns, incontinence, immobility, and physical dependency. According to the regression model (see Table 7), the elderly participants who are < 80 years old are 1.6-fold more likely to stay at home than those who are  $\geq 80$  years ( $OR = 1.6, P = 0.0001$ ). Four predictors are closely related to social support, such as currently living with family

members, having a primary caregiver, being married, and not living alone. Three predictors for elders' home stay are related to safety and comfort, such as elders' use of a grab bar, over-bed table, and hospital bed. Three predictors are associated with personal care needs, such as having no difficulty in controlling the bladder, having no difficulty in controlling the bowels, and using a bedside commode. Three predictors are related to mobility, such as using a cane or crutches, using a walker, and using a manual wheelchair. Two predictors are related to physical dependency, such as receiving help for eating and receiving help for light housework.

The findings from this secondary data analysis study strongly suggest that family proximity plays a significant role in elders' home stay. According to the regression model, family factors are significant predictors of elders' home stay, particularly living with family members, having a primary caregiver other than the agency, and being married. As currently living with family members is such a strong predictor ( $OR = 348.5, P = 0.0001$ ), appropriate interventions could include encouraging and supporting family relationships between elders and their family members. Suggested interventions to support family caregivers include: family caregiver workshops, family relationship enrichment programs, early financial/retirement planning courses, respite care, senior companion services, and caregiver support groups.

The logistic regression analysis model does not capture all of the factors that influence the elders' home stay outcome as this study used only the existing data files from the NHHCS 2000. This research limitation highlights the need for additional research to identify additional predictors for elders' home stay, such as mental health, spirituality, family availability, the ability to drive a motor vehicle, and the resources available to plan for various types of residential options. Future research may explore the relationship of these variables to elders' home stay.

## CONCLUSION

The desire of elderly individuals to stay at home is understandable, but there are many obstacles to achieving this commonly desired residential goal. Based on this study's findings, 16 factors significantly add to the predictive ability of the logistic regression model for elders' home stay. Living with family members is the strongest predictor of elders' home stay. This finding suggests a need to provide support not only for elders, but also for their family members, particularly their family caregivers. Other predictors are also supported by the literature and have clinical implications. Consideration of these significant predictors as targets for clinical interventions might allow health-care providers to develop strategies to assist elders to remain in their own homes.

This study helps to narrow the gaps in knowledge regarding living arrangements in later life as the logistic regression model of 16 predictors demonstrates the complex nature of elders' home stay. Planning is important for elders' home stay. Although the process of arranging a sound living environment for elders can be lengthy and difficult, we recommend that it start with open communication among elders,

**Table 7.** Predictors of American elders' home stay: a multiple logistic regression model ( $n = 9414$ )

Variable	Wald	<i>P</i>	Odds ratio	95% CI†
Demographic characteristics				
< 80 years old	30.8	0.0001	1.6	1.4–1.9
Married	40.2	0.0001	0.4	0.3–0.5
Socioeconomic status				
Living with family members	1265.0	0.0001	348.5	252.4–481.1
Not living alone	652.1	0.0001	0.7	0.6–0.9
Having a primary caregiver	10.9	0.0010	1.4	1.2–1.7
Functional abilities				
Not receiving help for eating	20.0	0.0001	1.7	1.3–2.1
Not receiving help for light housework	11.6	0.0010	0.7	0.6–0.9
Physical health				
Having no difficulty in controlling the bladder	9.7	0.0020	1.4	1.1–1.7
Having no difficulty in controlling the bowels	8.3	0.0040	1.4	1.1–1.7
Elders' use of aids or devices				
Not regularly using a bedside commode	56.3	0.0001	0.4	0.3–0.5
Not regularly using a cane or crutches	23.1	0.0001	0.7	0.5–0.7
Not regularly using grab bars	68.1	0.0001	2.9	2.2–3.7
Not regularly using a hospital bed	12.4	0.0001	1.5	1.2–1.9
Not regularly using an over-bed table	34.8	0.0001	2.4	1.8–3.2
Not regularly using a walker	10.4	0.0010	0.7	0.6–0.9
Not regularly using a manual wheelchair	9.5	0.0020	1.4	1.1–1.7

†95% confidence interval.

their family members, and their primary care physicians. It is better to have those conversations at an early point in time as it can become even more challenging and complex when more factors come in to play in later life.

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