

Determinants of Remaining in the Community Post-Discharge: Results from New Jersey's Nursing Home Transition Program

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Introduction

To inform states with nursing home transition programs (NHT), we determine what risk factors are associated with participants' long-term readmission to a nursing home (NH) within a year after discharge. We examined New Jersey's NHT program, Community Choice Counseling (CCC) program. Counselors work with the NHs to identify potentially eligible residents.

- To be eligible for this program, residents need to be:
 - medically-stable for discharge,
 - restored to practical functioning levels, and
 - choose to live continually in a community setting (i.e., interested in leaving and cognitively able to participate in the decision making; New Jersey Department of Health and Senior Services, 1999).
- Counselors provide instrumental assistance and emotional support.

Although NHT programs such as New Jersey's assist NH residents through the transition process, there are concerns about what happens to these older adults, especially those with longer stays once they re-enter the community as well as questions about the factors that predict their ability to remain in such settings. Therefore, this study focuses on a sample of NH residents aged 65 and over who had participated in the New Jersey NHT program to determine what happened to them during their first year after discharge.

Model

We used Andersen's behavioral model to select predictors of long-term NH readmission, and Cox proportional hazards regressions to examine the relative risk of experiencing such readmissions. Andersen's behavioral model posits that health behaviors (including service use) are a function of predisposing, enabling, and need characteristics.

- Individuals' predisposing characteristics are the most distal to service use and include demographic (such as age, marital status) and social factors (such as social support and health beliefs and attitudes).
- Enabling resources must be present for service use to take place and include indicators of family and community resources (such as eligibility for Medicaid).
- Need factors (the most proximate cause) include indicators of self-perceived and practitioner-evaluated health.

We chose Andersen's framework since it is a widely employed model and has long been used to explain the use of health services by the elderly and in particular to predict NH admission.

Design & Methods

Sample:

- In total, 1354 NH residents aged 65 and over were discharged during this time period with assistance from NJ's NHT program.
- A total of 628 discharges or their proxies completed the interview.

Data Source:

- This study used a structured telephone interview to survey all persons transitioning through New Jersey's NHT program from January 1, 2000 to December 31, 2000.
- State administrative data were available for all 1354 NH residents, and were used to verify NH readmissions and deaths as well as provide basic demographic and NH length of stay information.

Measures:

- The dependent variable was measured in two ways.
 - Categorical groups of long-term NH readmission, died, or remained in the community.
 - Duration (in days) until the person experienced a long-term NH readmission. In the latter analysis, death was treated as a censoring event (died before experiencing the event), and those who remained in the community were also considered censored (not having experienced the event) at the end of 1 year after discharge.
- Independent variables included demographics, living situation, use of services, need for services, receipt of informal or formal help with ADLs, self-perceived and practitioner-evaluated health, prior NH length of stay, and experiencing acute health events within the 8-10 week post-discharge period (falls, emergency department visit, or hospital admissions)

Analysis

- Bivariate techniques were used to determine the differences between the three outcome groups for all 1354 discharges.
- Bivariate analysis was used to examine the three outcome groups by the independent variables.
- Cox proportional hazards regression to measure the relative risk of experiencing a long-term readmission versus remaining in the community for the entire one-year observation period.

Table 1: Comparison of Groups by Disposition at One Year Post Discharge by Original Length of Stay, Gender, and Age

Using state administrative data, we were able to compare respondents and non-respondents in terms of gender, age, and original length of NH stay (OLOS). As might be expected, age was positively and significantly related to increased / longer OLOS.

	Deceased (N=254)	Long NH Readmissions (N=117)	Remained in the Community (N=983)
Original Length of Stay (OLOS)**			
<= 90 days	77.8%	65.2%	78.5%
> 90 days	22.2%	34.8%	21.5%
% Female**	65.5%	65.2%	73.7%
Mean Age (S.D.)	80.6 (7.6)	79.2 (7.3)	80.2 (7.8)

**Significantly different by disposition (p<.01)

Table 2: Respondent Characteristics, Function, and Health Indicators at 8 to 10 Weeks Post-Discharge and by Disposition at One Year Post-Discharge

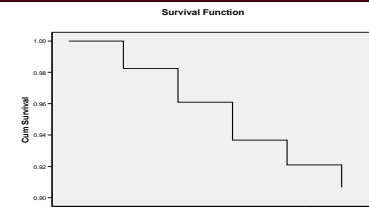
Basic Characteristics	Deceased (N=106)	Long NH Readmissions (N=51)	Remained in the Community ^a (N=471)
Predisposing Factors			
Mean Age (S.D.)	81.2 (8.1)	79.2 (6.6)	79.7 (8.0)
Female	61.3%	60.8%	75.2%
Married	25.5%	10.0%	22.8%
Informal "Main" Caregiver	66.3%	50.0%	61.5%
Formal "Main" Caregiver**	26.7%	40.9%	22.8%
Health Beliefs^a			
Indicated 1 Health Behavior	18.9%	37.3%	18.7%
Indicated 2 Health Behaviors	43.4%	31.4%	36.7%
Indicated 3 Health Behaviors	37.7%	31.4%	44.6%
Lives Alone ^a	28.3%	21.6%	36.4%
Enabling Factors			
Education Level			
< High School	46.4%	46.7%	42.5%
High School	36.4%	35.6%	34.7%
> High School	17.2%	17.8%	22.8%
Current Living Situation has an Available Package of Services	17.3%	29.7%	21.0%
Satisfied with Situation**			
Satisfied	92.4%	76.5%	86.5%
Somewhat Satisfied	5.7%	3.9%	7.8%
Not Satisfied	1.9%	19.6%	5.8%
Informal Help with ADLs**	52.5%	44.9%	31.8%
Formal Help with ADLs**	46.2%	51.0%	36.7%
Unable to Use Transportation ^a	85.6%	92.2%	75.7%
Need Factors			
Average Number of ADLs Dependencies (S.D.)**	2.1 (1.9)	1.76 (1.9)	1.0 (1.5)
Average Number of IADLs Dependencies (S.D.)**	6.0 (2.5)	6.0 (2.3)	4.6 (2.6)
Index of Ability and Limitations (S.D.)**	7.0 (2.4)	6.0 (2.3)	5.6 (2.6)
Has the Services Needed to Remain in the Community	79.4%	80.4%	87.6%
Self-perception of Health **			
Poor	30.8%	9.8%	10.1%
Fair	36.5%	39.2%	32.1%
Good	23.1%	39.2%	33.8%
Very Good/Excellent	9.6%	11.8%	23.9%
Health Events			
Falls**	34.3%	39.2%	21.4%
ED Visit/Hospitalization**	54.7%	51.0%	26.8%
Have the Things that Make Life Enjoyable ^a	57.8%	64.7%	71.6%
Unable to Manage One's Own Medication**	83.0%	80.4%	61.1%
Original Length of NH Stay			
< 90 Days	77.1%	72.5%	78.7%
> 90 Days	22.9%	27.5%	21.3%

^aIncludes those who had a short NH stay during the observation year.

**Significantly different at p < .05 Chi-Square Test

**Significantly different at p < .01 Chi-Square Test

Table 3: Survival Analysis Remaining in the Community: Life Table Results in 90 Day Intervals



Post-Discharge Days	0 to 89 Days	90 to 179 Days	180 to 269 Days	270 to 369 Days	370+ Days
Number Entering Interval	628	617	557	542	508
Number Withdrawing During the Interval	0	47	1	25	504
Number Entering LTNH Stay During the Interval	11	13	14	9	4

Table 4: Cox Regression Analysis: Relative Risks and 95% Confidence Intervals (CI) of Having a Long-Term Nursing Home Readmission During the First Year after NH Discharge Through the New Jersey Nursing Home Transition Program (N=628)

Predisposing Factors	Relative Risk (95% C.I.)	Enabling Factors	Relative Risk (95% C.I.)
Female**	0.46 (0.25, 0.82)	Received Formal Help With ADLs	1.16 (0.57, 2.33)
Married**	0.22 (0.09, 0.59)	Unable to Use Transportation	2.66 (0.78, 9.12)
Health Beliefs (2 of 3 Behaviors)	0.46 (0.23, 0.93)	Need Factors	
Health Beliefs (3 Behaviors)	0.54 (0.26, 1.10)	Dependent in 3-5 ADLs	1.20 (0.50, 2.84)
Lives Alone*	0.42 (0.19, 0.92)	Dependent in 1-2 ADLs	0.95 (0.42, 2.15)
Satisfied with Living Situation**	0.32 (0.15, 0.71)	Fall ^a	1.86 (0.99, 3.48)
Somewhat Satisfied with Living Situation	0.14 (0.03, 0.68)	ER Visit or Hospitalization	1.41 (0.73, 2.72)
		Unable to Manage One's Own Medications	1.30 (0.59, 2.86)
Overall Chi-Square**	59.59 (df=14)	- 2 log likelihood**	560.00

* Significant at p < 0.05 compared with the reference category

** Significant at p < 0.01 compared with the reference category

Results

- Although approximately one-third of the sample either experienced a NH readmission or died during the first year post-discharge, it is notable that the predominance of former NH residents (72%) continuously remained in the community.
- 40.9% of those returning for a long-term readmission indicated that they had a formal caregiver, compared to those who died (26.7%) or remained in the community (22.8%).
- Receipt of any help with ADLs, informal or formal, was significantly associated with dying or having a long-term readmission, perhaps because receipt of help was an indicator of greater underlying need.
- The individual's OLOS stay (coded in three ways: 30 day increments up to 120 days, as a dichotomized variable using a 90 day cut-off, and as a continuous measure) was not significantly associated with disposition outcome at one year.
- Females have about half the risk of males of having a long-term readmission.
- Those living alone had relatively less than half the risk of a long-term readmission than those who lived with others.
- Individuals who were married had only 22% risk of a long-term readmission.
- Those who reported at least two of three positive health behaviors had about half the risk of having a long-term readmission during the observation year than those reporting fewer (0-1).
- Those with the enabling factors of inability to use transportation, and receiving formal help with ADLs continued to show increased risk of long-term readmission, but these variables did not maintain significance in the survival model.
- Similarly, the need factors of increased number of impaired ADLs and need for medication management, as well as hospitalization indicated increased risk for long-term readmission, but did not retain significance.
- Notably, having a fall during the 8-10 weeks following their original NH discharge was significant. Specifically, those who had at least one fall had almost twice the relative risk (1.86) of long-term readmission as those who did not.

Implications for Policy Makers

- Most of the factors predicting long-term readmission were predisposing, not need factors; this points to the limits of formulate approaches to assessing potential candidates for discharge and the importance of working with clients to understand and address their particular vulnerabilities.
- Unexpectedly, age and OLOS were not significant predictors of long-term readmission as previously reported in the literature. However, the direction of our bivariate findings suggests that age and OLOS while important may be serving as proxies for other factors such as frailty and social support.
- Since having a fall within 8-10 weeks post-discharge was significant, more resources might need to be directed towards home-based fall risk assessment and services that prevent falls.