Reasons for home care clients' unplanned Hospital admissions and their associations with patient characteristics

Jukka K. Rönneikkö[a,*], Esa R. Jämsen[b,c,d], Matti Mäkelä[e], Harriet Finne-Soveri[f], Jaakko N. Valvanne[b,c,g]

[a] Ylöjärvi Health Care Centre, Ylöjärvi, Finland
[b] Faculty of Medicine and Life Sciences, University of Tampere, Tampere, Gerontology, Finland
[c] Research Center (GEREC), Universities of Jyväskylä and Tampere, Finland, Hatanpää hospital, Finland
[d] Service Line of General Practice and Geriatrics, Tampere, Finland
[e] National Institute for Health and Welfare, Helsinki, Finland
[f] Elderly Care Services, City of Helsinki, Finland
[g] Promotion of Senior Citizens' Welfare, City of Tampere, Finland, Tampere University Hospital, Tampere, Finland

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ABSTRACT

Background: Unplanned hospitalizations and emergency room visits occur frequently among home care clients The aim of this study was to identify typical discharge diagnoses and their associations with patient characteristics among a total of 6812 Finnish home care clients aged ≥63 years who were hospitalized within one year of their first home care assessment.

Methods: A register-based study based on Resident Assessment Instrument-Home Care (RAI−HC) assessments and nationwide hospital discharge records. The RAI−HC assessments were linked to the hospital discharge records of the participants' first unplanned hospitalization. Univariate and multivariable regression analyses were used to evaluate the association of RAI−HC determinants with discharge diagnoses.

Results: The most common reason for the first hospitalization was an infectious disease (21%; n = 1446). When hospitalizations were classified according to the main diagnosis, chronic skin ulcers, functional impairment and daily urinary incontinence were associated with hospitalization due to infectious diseases; impaired cognitive capacity, Alzheimer's disease or other dementia and polypharmacy (protective effect) were associated with hospitalizations due to dementia; age of ≥90 years, congestive heart failure, coronary artery disease and using ≥10 drugs with hospitalizations due to heart diseases; and moderate or strong pain with hospitalization due to musculoskeletal disorders. Previous falls, female sex and an earlier hip fracture were associated with injury-related hospitalizations. Feelings of loneliness increased the odds of hospitalization due to geriatric symptoms without a specific diagnosis.

Conclusion: Patient characteristics and geriatric syndromes identified using RAI−HC predict the reasons for future hospitalizations among new home care clients.

1. Introduction

The aim of home care services is to help people with functional limitations to live in their own homes. Home care is considered a possible strategy for reducing hospital use among older people (Landi, Onder, & Russo, 2001), and in fact, there are studies showing that home care prevents hospitalizations among selected older people (Bernabei, Landi, & Gambassi, 1998; Vasquez, 2008). Nevertheless, unplanned hospitalizations and emergency room visits occur frequently among home care clients, and they are often associated with adverse outcomes (Doran, Hirdes, & Poss, 2009; Dorr, Jones, & Burns, 2006; Ronneikko, Makela, & Jamsen, 2017).

Although hospitalizations are often due to acute exacerbations of chronic diseases (Landi, Onder, & Cesari, 2004), an earlier study among new home care clients indicated that many of the risk factors predicting unplanned hospitalization represent major geriatric challenges (Ronneikko et al., 2017). Targeting the identified risk factors for hospitalization (Fortinsky, Madigan, & Sheehan, 2006; Landi et al., 2004; Morris, Howard, & Steel, 2014; Paddock & Hirdes, 2003; Ronneikko et al., 2017; Rosati, Huang, & Navaie-Waliser, 2003; Shugarman,

Buttar, & Fries, 2002) could provide a means to prevent future hospitalizations. A better understanding of how patient characteristics are linked to different reasons for hospitalization would help to identify potentially modifiable conditions and thereby to reduce hospital admissions.

The aim of the present study, which is based on nationwide register data and Resident Assessment Instrument for Home Care (RAI−HC) assessments, is therefore to identify conditions that could be targeted in the care planning of home care clients to prevent hospital admissions. This study extends an earlier analysis (Ronneikko et al., 2017), describes the most common discharge diagnoses, and analyzes how patient characteristics are associated with the reasons for hospitalization.

2. Methods

The Resident Assessment Instrument for Home Care (RAI−HC) is a comprehensive assessment system developed by InterRAI, a multinational research network dedicated to cross-national comparisons of health and health care for elderly people and people with disabilities. The collected data contains core assessment items necessary for a comprehensive assessment, such as function, health, social support, and service use (Morris, Fries, & Steel, 1997), and its reliability and validity have been tested in international studies (Bernabei et al., 1998; Landi, Tua, & Onder, 2000; Morris et al., 1997).

This study was based on the first RAI−HC assessments made for new home care clients (i.e. persons with no previous use of home care), aged ≥63 years, in Finland in 2009–2011 (n = 15,700) and hospital discharge records of those clients who were hospitalized at least once within one year of the first RAI−HC assessment (n = 6812). The nurses responsible for each client perform the assessments, and they have been trained in the use of RAI−HC. According to national guidelines, home care clients are assessed upon initiation of services and thereafter at least twice a year. The RAI data were collected from the national database maintained by the National Institute for Health and Welfare (THL), which includes assessments from both rural (30%) and urban (70%) settings. Of the RAI−HC scales, those measuring activities of daily living performance (ADLh) (Morris, Fries, & Morris, 1999), cognitive performance (CPS) (Morris, Fries, & Mehr, 1994), depression (DRS) (Burrows, Morris, & Simon, 2000), pain, and health stability (CHESS) (Hirdes, Frijters, & Teare, 2003) were used in this study. The variables used in the analyses are listed in Table 1.

The information about hospitalizations and discharge diagnoses (according to International Classification of Diagnoses, 10th revision) were collected from the Finnish Hospital Discharge Register (FHDR) and were linked to the RAI−HC data using each citizen's unique identification number. The FHDR contains the data of all discharged patients from inpatient care in health centers and hospitals, including both public and private institutions. The coverage of the register exceeds 95%, and the completeness and accuracy of the registered items varies from satisfactory to very good (Sund, 2012).

For this study, only the first hospitalizations occurring within one year of the first RAI−HC assessment were included. Scheduled hospitalizations (e.g. elective surgery) were excluded, because the aim was to analyze unplanned hospitalizations. The hospitalizations were divided into nine diagnosis groups according to their primary discharge diagnoses (the first registered diagnosis representing the main cause of hospitalization according to the treating physician): infectious diseases; dementia; cardiovascular, cerebrovascular, and musculoskeletal diseases; other specific diseases; geriatric symptoms (e.g. malaise, dizziness, syncope, malnutrition); injuries; and other reasons (Appendix Table A1 in Supplementary materials). The diagnosis groups were determined according to the previous studies concerning hospital care among old people (Natalwala, Potluri, & Uppal, 2008; Walsh, Roberts, & Hopkinson, 2007) and to the authors' clinical experience. Final classification was reached by consensus between three experienced geriatricians. Finally, in order to clarify how often geriatric syndromes

Table 1
Characteristics of those hospitalized.

	ALL N 6812	%
Demographic		
Age		
63-74v	**1160**	17,0
75-79v	**1137**	16,7
80-84v	**1935**	28,4
85-89v	**1675**	24,6
90 + v	**905**	13,3
Gender		
Female	**4610**	67,7
Male	**2202**	32,3
Social situation		
Living alone	**4624**	67,9
Caregiver stressed	**611**	9,0
Housing defects	**1723**	25,3
Use of services		
Reason for home care: client has been discharged from hospital	**2384**	35,0
Hospitalization during one year before assessment	**5135**	75,4
Acute outpatient care in 90 days before assessment	**2537**	37,2
Function		
ADLH (0 - 6)		
0	**4920**	72,2
1-2	**1079**	15,8
3-4	**669**	9,8
5-6	**144**	2,1
Client believes he/she is capable of improving performance in physical function	**1117**	16,4
CPS		
0	**2599**	38,2
1-2	**3317**	48,7
3-4	**514**	7,5
5-6	**382**	5,6
Clinical symptoms		
Urinary incontinence daily	**1319**	19,4
Fecal incontinency	**537**	7,9
Chronic skin ulcers	**586**	8,6
Mouth problems	**5637**	82,8
Vision		
good enough	**5076**	74,5
moderately impaired	**1557**	22,9
severely impaired	**179**	2,6
Falls during 90 days before assessment	**2171**	31,9
DRS		
0-2	**5669**	83,2
3-14	**1143**	16,8
Feeling lonely	**1554**	22,8
Poor self-rated health	**2307**	33,9
BMI		
< 18.5	**404**	5,9
18.5-23.9	**2251**	33,0
24-29.9	**2279**	33,5
≥ 30	**1076**	15,8
PAIN		
0-1	**4378**	64,3
2-3	**2434**	35,7
Diagnoses		
Congestive heart failure	**1502**	22,0
Coronary artery disease	**1808**	26,5
Alzheimer's disease	**1299**	19,1
Other dementia	**1932**	28,4
Old stroke	**1932**	28,4
Parkinson's disease	**261**	3,8
Parkinson's disease and dementia	**66**	1,0
Musculoskeletal disorders	**1711**	25,1
Old hip fracture	242	3,6
Old other fracture	262	3,8
Cancer	**644**	9,5
Renal insufficiency	**409**	6,0
Psychiatric diagnosis	**852**	12,5
Chronic obstructive pulmonary disease	**832**	12,2
Diabetes	**1632**	24,0
Medication		
Number of drugs *		
0-4	**734**	10,8