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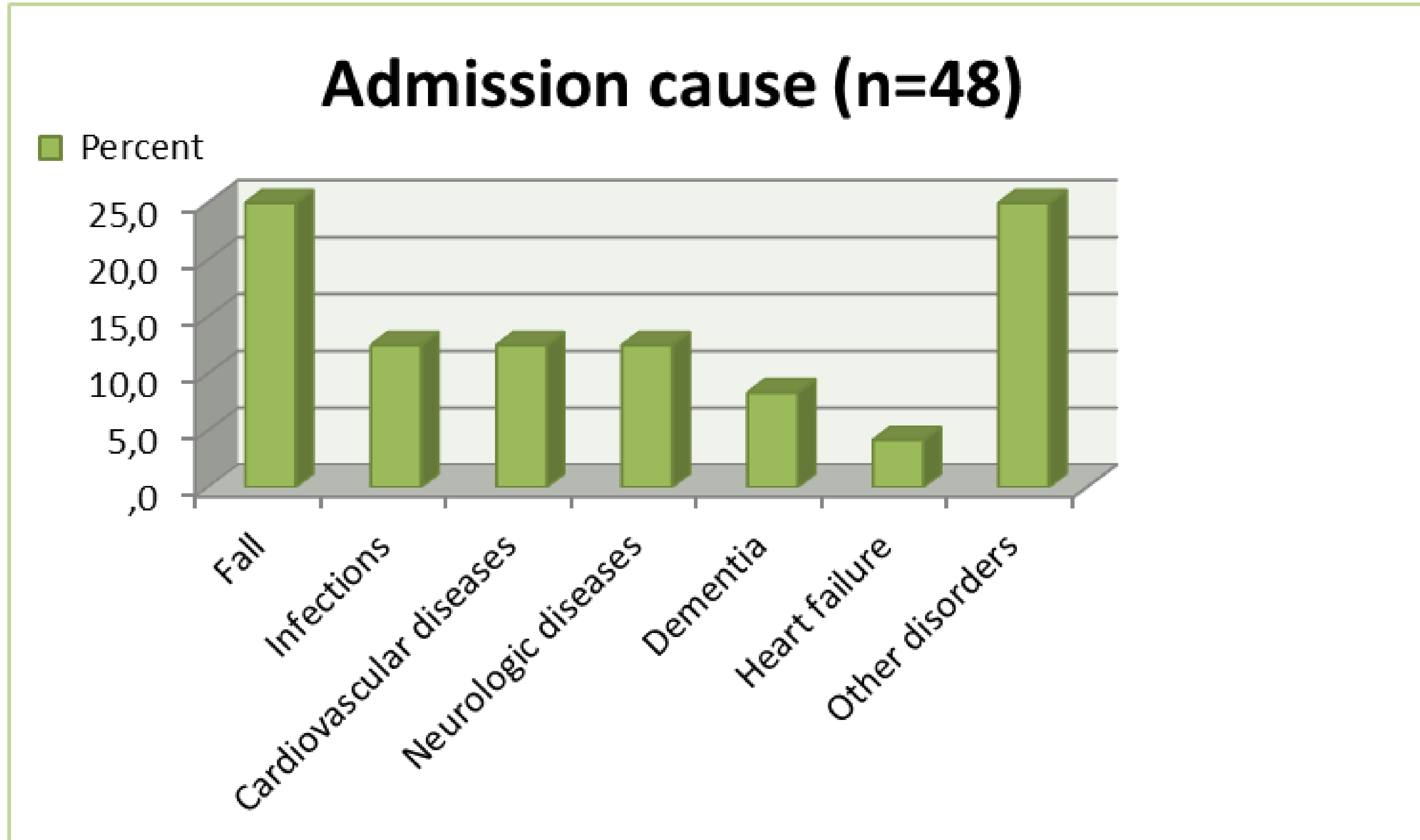
Conclusion: The most common reason to be hospitalized among elderly persons living in residential care is complications caused by a fall. Persons who have been hospitalized during the last six months have an increased risk of malnutrition, and there is a tendency for an increased risk of falling. Our results also indicate that the numbers of staff on the wards were not related to hospitalization. Further studies are needed to discern whether the person who is hospitalized due to fall, also has been assessed as high risk of falling.

Background: Sweden has an increasingly aging population, where the number of residents over 75 years now reaches 800 000 people, and the number of elderly is expected to increase even more over the coming decades. Every year 1.4 million visits are made to acute care or hospital in Sweden. Old persons make about one third of these visits and many of these visits are considered to be unnecessary. Hospitalization may for an older person involve unnecessary suffering and may also lead to confusion. It is not unusual that older persons who have been hospitalized have poorer function at discharge than before the hospitalization. Little is known about the characteristics of those old persons who live in institutions and who get hospitalized. The aim of this study was to describe the characteristics regarding the elderly living in residential care who get hospitalized, and the reasons for hospitalization.

Sample: This study is based on the *Study of Health and Drugs in Elderly living in institutions* (SHADES) including 423 elderly living in residential care in Sweden. Participants were examined every six months during three years. We used cross-sectional data from the first in-person testing, including 259 old persons. The mean age was 85.15 years, range 65 - 101, 73% of the participants were females.



Figure 1. Reason for hospitalization



	Hospitalized Mean (SD) / N (%)	Not Hospitalized Mean (SD) / N (%)	P-value
Age	85.9 (7.49)	84.9 (7.31)	0.359
Gender, men	30.06	35.5	0.464
Number of drugs	8.04 (2.91)	6.64 (2.92)	0.003
Number of diseases	3.04 (1.26)	2.71 (1.35)	0.122
Social visits - no visits	8.7	11.6	0.228
Social visits 1-3 visits in 2 weeks	43.5	54.2	
Social visits >4 visits in 2 weeks	47.8	34.2	
No physical activity	0.70	0.53	0.065
MMSE	14.56 (6.86)	17.11 (6.86)	0.048
MNA <11	73.8	43.8	0.001
DFRI	5.57 (1.70)	4.79 (1.58)	0.002
Hb	121.43 (12.32)	127.80 (14.44)	0.007
CRP	6.48 (3.64)	6.18 (3.54)	0.607
MNS	21.48 (4.01)	21.84 (3.42)	0.565
CSD	3.29 (3.16)	2.37 (3.15)	0.100
Number of nurses	0.03 (0.01)	0.03 (0.01)	0.350
Other staff	0.71 (0.09)	0.71 (0.07)	0.812

Table 1. Characteristics of the sample based on whether they have been hospitalized or not during the last six months

Results: Preliminary findings show that 18.5 % of the subjects had been hospitalized at least once during the last six months. The reasons for hospitalization are shown in Figure 1. Except for the main reasons for hospitalization, older persons living in residential care were also hospitalized due to gastrointestinal symptoms, pain problems, anemia, skin problems, etc. There was a clear association between hospital admissions among people in residential care and being at risk for malnutrition (Table 2). There was also a trend toward an association between hospital admissions and increased risk of falling. There was no significance for higher or lower staff ratios in the residential care and hospitalization. Neither age nor gender were found to be associated with hospitalizations.

Discussion: Previous studies have shown that the causes of hospitalizations among people living in residential care are mainly fall, heart failure, diabetes, respiratory and circulatory insufficiency. The present study showed similar results. Previous studies have found that old age was associated with hospitalization, but not found in the present study. Older persons who have been hospitalized in six months or less are at a higher risk of suffering from malnutrition, than persons that have not been hospitalized. There is a tendency for an association between falling risk and hospitalizations. It would be interesting to investigate whether these people become hospitalized due to falls or due to other reasons.

	B	S D	P-value
Age	0.02	0.02	0.299
Gender	-0.42	0.34	0.212
Hb	-0.02	0.01	0.141
Number of drugs	0.05	0.05	0.305
MNA	1.12	0.30	<0.001
MMSE	0.02	0.02	0.424
DFRI	0.19	0.10	0.064

Table 2. Factors that are associated with an increased risk of hospitalization

Methods and procedures: The participants' psychological, social and physical status were assessed with standardized procedures and well-established tests and scales by trained research nurses.

- Demographic factors included age and gender
- Physical activity, physically active to some extent (coded as 1) and not physically active (coded as 0)
- Social visits, no visits (coded as 0), 1 – 3 visits in two weeks (coded as 1), or 4 or more visits in two week (coded as 2)
- Number of drugs and number of diseases based on medication lists and medical records.
- Biomarkers such as Haemoglobin (Hb) and sensitive C-reactive Protein (CRP) was assessed
- Staff ratio, either low staff ratio (coded as 0) or high staff ratio (coded as 1)
- *Mini-Mental Status Examination Test* (MMSE) is a short test of cognitive ability, with a maximum score of 30. MMSE was dichotomized at 24, which is usually considered to be an indication of cognitive impairments.
- *Mini Nutritional Assessment* (MNA) assesses a person's nutritional status through questions about food intake, weight loss, mobility, psychological stress or acute illness, neuropsychology and BMI (body mass index). Maximum score is 14, where less than 11 points indicates risk of malnutrition.
- *Downton Fall Risk Index* (DFRI) is a test that measures the risk of falling by questions regarding previous falls, sensory impairment, cognitive impairment, and walking ability. Maximum score is 11, with scores higher than 3 indicates a high risk of falling.
- *Modified Norton Scale* (MNS) assesses the risk of developing pressure ulcers.
- *Cornell Depression Scale* (CDS) assess signs and symptoms of major depression in patients with dementia.

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