

**BACKGROUND**

Acutely admitted patients who are dependent on homecare may be especially challenged in relation to readmissions and mortality.



**AIM**

To assess whether readmission and mortality after a short acute admission were associated with receiving homecare and to explore if a potential risk was related to the number of minutes of received homecare.

**METHODS**

This register-based cohort study included patients above 65 years who were acutely admitted to a Danish hospital from 1<sup>st</sup> of December 2016 to 30<sup>st</sup> of November 2017 and discharged within 48 hours.

Data from the Danish National Patient Registry and the Danish Registration of Elderly were extracted from Statistics Denmark. Patients without Danish citizenship and patients living in residential care were excluded.

Homecare was categorised in three levels according to the number of minutes of homecare received: ≤ 30 min, ≥ 31 min - ≤ 120 min or ≥ 121 min homecare per week. Logistic regression analyses were used to explore the association between the amount of homecare received and readmission and mortality.

**RESULTS**

In total 80,517 patients were included. Among these 19 % (n=15,631) received homecare (table I). The distribution across the homecare categories was: 32% (n=4,938) < 30 min, 26% (n=4,033) 31min – 120 min and 42% (n=6,660) > 121 per week. The odds for readmission and mortality increased depending on the amount of time the patients received homecare.

**TABLE I: DEMOGRAPHICS AND CHARACTERISTICS OF THE STUDY POPULATION**

Variables	All patients n=80,517	Patients with no homecare n=64,886	Patients receiving homecare n=15,631	P-value Homecare vs. no homecare
Age(year) median(IQR)	75 (70-82)	74 (70-80)	83 (76-88)	<0.001
Marital status (married) (%)	54 (n=43,498)	62 (n=39,725)	24 (n=3,773)	<0.001
Sex (female) (%)	51 (n=40,882)	48 (n=30,918)	64 (n=9,964)	<0.001
In treatment for mental disorder* (%)	34 (n=27,517)	30 (n=19,243)	53 (n=8,274)	<0.001
In treatment with (%)**				
Antipsychotics	2 (n=1,696)	2 (n=1,078)	4 (n=618)	<0.001
Anxiolytics	5 (n=4,311)	5 (n=3,125)	8 (n=1,186)	<0.001
Hypnotics & sedative	11 (n=9,069)	10 (n=6,740)	15 (n=2,329)	<0.001
Antidepressants	8 (n=6,706)	7 (n=4,558)	14 (n=2,148)	<0.001
Medicine for dementia	2 (n=1,272)	1 (n=628)	4 (n=644)	<0.001
Income after taxes (Danish kroner) median (IQR)	164,815 (132,053 – 217,901)	166,016 (130,245- 226,343)	162,132 (139,145- 191,846)	<0.001
Charlson Comorbidity index median (IQR)	0 (0-2)	0 (0-1)	1 (0-2)	<0.001
0	60 (n=48,548)	64 (n=41,358)	46 (n=7,190)	
1	12 (n=10,066)	11 (n=7,414)	17 (n=2,652)	
2	17 (n=13,562)	16 (n=10,418)	20 (n=3,144)	
>3	11 (n=8,341)	9 (n=5,696)	17 (n=2,645)	
Mortality (%) ≤ 360 days	12 (n=10,126)	10 (n=6,284)	24 (n=3,842)	<0.001
Readmission (%) *** 1 – 30 days	18 (n=13,930)	16 (n=10,561)	22 (n=3369)	<0.001

Difference between groups tested are with Wilcoxon test (unequal distribution) and Pearson chi2.  
\* Treatment for mental disorder anytime within the year before index admission.  
\*\*Patients can appear in more than one categories.  
\*\*\*Readmission categorized in number of days after discharge from the index admission

Patients receiving homecare ≥ 121minutes a week had the highest odds for readmission within 30 days 1.56 (1.47 – 1.66) OR (95% CI) and for mortality within 360 days 4.72 (4.46 – 5.0) OR (95% CI), compared to patients without homecare (table II).

**TABLE II: ASSOCIATION BETWEEN HOMECARE CATEGORIES: READMISSION AND MORTALITY**

Variables	Patients receiving homecare 0 - 30 min/week n=4,938	Patients receiving homecare 31-120 min/week n=4,033	Patients receiving homecare >121 min/week n=6,660
Readmission < 7days Crude OR (95% CI) Adjusted OR (95% CI)	1.13 (1.02 – 1.25)* 1.06 (0.95 – 1.18)	1.17 (1.05 – 1.30)* 1.08 (0.96 – 1.21)	1.36 (1.25 – 1.48) ** 1.20 (1.10 – 1.32) **
Readmission < 30days Crude OR (95% CI) Adjusted OR (95% CI)	1.28 (1.19 – 1.38) ** 1.17 (1.09 – 1.26) **	1.33 (1.23 – 1.44) ** 1.19 (1.09 – 1.29) **	1.56 (1.47 – 1.66) ** 1.32 (1.24 – 1.42) **
Mortality < 180 days Crude OR (95% CI) Adjusted OR (95% CI)	1.71 (1.56 – 1.88) ** 1.08 (0.97– 1.20)	2.21 (2.01 – 2.44)** 1.30 (1.18 – 1.45)**	4.47 (4.19 – 4.77)** 2.28 (2.10 – 2.46) **
Mortality < 360 days Crude OR (95% CI) Adjusted OR(95% CI)	1.81 (1.67 – 1.96)** 1.14 (1.04 – 1.25) *	2.33 ( 2.15 – 2.53)** 1.39 (1.27 – 1.52) **	4.72 (4.46 – 5.0)** 2.45 (2.28 – 2.62)**

Patients with no homecare (n=64,886) are the reference group. Data are Odds ratios with 95 % CI. Readmission and mortality were calculated from time of the discharge time of the index admission. Logistics regression were adjusted for age, Charlson Comorbidity Index and income as continues variable and sex, marital status, and treatment for mental disorder as categorical variables. Significance level with a p-value < 0.05 are marked with \* and significance level with p-value < 0.001 are marked with\*\*.

**CONCLUSION**

To receive homecare was associated with an increased risk for readmission and death following an acute admission. The risk increased by amount of received homecare.

Our finding suggest that care and treatment interventions in collaboration between the ED and primary sector should incorporate special focus on elderly receiving homecare in concern to their increased risk for mortality and readmission. Furthermore, knowledge about receiving homecare has potential to be used when designing screening tools to find high-risk patient.



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