

Is more homecare nursing associated with fewer hospitalizations at the end of life?:

A multi-provincial cancer cohort study

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BACKGROUND

Research shows that most patients prefer to be cared for and die at home. High rates of late-life hospitalization and hospital deaths are indicators of poor quality, and the main expense in the last year of life. Palliative and end-of-life care can be provided in patient's homes to improve pain and symptoms, quality of life, and relieve suffering. Homecare can be cost-effective by keeping patients at home, if desired, and avoiding unnecessary hospitalizations. Policymakers still require evidence of how best to use homecare nursing to effectively shift end-of-life care from hospitals to home-based settings. In particular, the evidence is lacking for the effectiveness of generalist homecare nurses in providing palliative care, who are far more common in the health system.

OBJECTIVES

To investigate the effectiveness of homecare nursing, especially by generalist nurses, to reduce end-of-life hospitalizations.

METHODS

A retrospective cohort study of end-of-life home care patients in the Canadian provinces of ON, NS, BC.

COHORT

≥19 years or older, have a prior cancer diagnosis and a confirmed cancer cause of death in the provincial cancer registry between April 1, 2004 and March 31, 2009.

DATA SOURCES

Each province individually sourced data using the provincial cancer registry, which was then linked with the other provincial administrative datasets: the Canadian Institute for Health Information's Discharge Abstract Database provided data for hospital admissions and comorbidity; the provincial homecare databases provided data on homecare nursing use; and the provincial health insurance databases provided information on demographics of age at death, sex, and postal code for income quintile, community size, and region.

OUTCOME: Hospital cost rate in a given week before death

$$\frac{\# \text{ of new hospital admissions in a week}}{\# \text{ of days out of hospital}}$$

EXPOSURE: Nursing cost rate in the previous week

$$\frac{\# \text{ of hours of nursing}}{\# \text{ of days out of hospital}}$$

ANALYSIS: Poisson regression with a generalized estimating equations (GEE) approach was used to analyze longitudinal data.

RESULTS

Our cohort included 83,827 cancer decedents. Approximately 55% of decedents were older than 70 [OR 31% of decedents were from 70 to 80 years] and the most common disease site (25%) was lung cancer. Nearly 85% of the cohort had at least one hospital admission and 88% received palliative care nursing in the home (Table 1). Among the decedents 16% were from rural communities (<10,000 pop), 19% were in the highest income quintile and 43% had a Charlson comorbidity score of 0.

Receiving palliative compared to standard homecare nursing in the last 6 months of life significantly reduced a patient's hospitalization rate by 34%, 33% and 17% in ON, BC, and NS (Table 2). In the last month of life, patients having a standard nursing rate of greater than five hours compared to one hour per week had a significantly lower hospitalization (relative reduction of 15-23%) across the three provinces. Patients who received no homecare nursing visits had a significantly lower rate of hospitalizations than those who received one hour, possibly because patients with no nursing hours may have had insufficient need or complexity (e.g. no symptom issues) or received other forms of support, i.e., private homecare, that reduced the need for hospital care.

Table 1: Cohort characteristics

		Nova Scotia N=5,280		British Columbia N=19,740		Ontario N=58,807		Total Cohort N=83,827	
Diagnosis less than 6 months from death	No	3,633	68.8	13,775	69.8	42,648	72.5	60,056	71.6
	Yes	1,647	31.2	5,965	30.2	16,159	27.5	23,771	28.4
Hospitalization in the last six months	No	177	3.4	3,429	17.4	9,342	15.9	12,948	15.4
	Yes	5,103	96.7	16,311	82.6	49,465	84.1	70,879	84.6
Palliative care nursing ever delivered	No	760	14.4	2,142	10.9	5,760	12.7	8,662	12.3
	Yes	4,520	85.6	17,598	89.2	39,646	87.3	61,764	87.7

Table 2: Multivariable Regression of Factors Associated with Hospitalization in the 6 months and Last Month of Life*

		Nova Scotia			British Columbia			Ontario		
		RR	Lower CI	Upper CI	RR	Lower CI	Upper CI	RR	Lower CI	Upper CI
LAST SIX MONTHS BEFORE DEATH										
Each week closer to death		1.10	1.08	1.11	1.10	1.10	1.11	1.09	1.09	1.10
Nursing Hours in the Prior Week	no nursing	0.69	0.60	0.79	0.49	0.45	0.54	0.47	0.44	0.50
	>0 to <2 (Ref)	1.00			1.00			1.00		
	>=2 hrs	1.00	0.93	1.09	1.16	1.11	1.21	1.13	1.10	1.16
Last month of life		2.03	1.81	2.28	1.72	1.62	1.83	1.77	1.71	1.84
Palliative Homecare Nursing	No - Standard (Ref)	1.00			1.00			1.00		
	Yes	0.83	0.76	0.90	0.67	0.64	0.71	0.66	0.65	0.68
LAST MONTH OF LIFE										
Each week closer to death		1.71	1.63	1.80	1.51	1.47	1.55	1.55	1.52	1.57
Nursing hour in the prior week	no nursing	0.54	0.45	0.65	0.40	0.36	0.45	0.34	0.31	0.37
	>0 to <2 (Ref)	1.00			1.00			1.00		
	>=2 to <5 hrs	0.99	0.89	1.11	0.92	0.87	0.98	0.96	0.93	1.00
	>=5 hrs	0.83	0.73	0.95	0.85	0.76	0.95	0.77	0.73	0.80
Palliative Homecare Nursing	No - Standard (Ref)	1.00			1.00			1.00		
	Yes	0.71	0.62	0.80	0.60	0.56	0.65	0.60	0.58	0.63

Values in Bold and Italics are statistically significant

* regression results are all controlled for decedents' age, sex, diagnosis type, community size and income

CONCLUSIONS

Our multi-provincial, population-based, study showed a protective effect of nursing with a palliative care intent on hospitalization across the last six months of life and of standard nursing in the last month. This finding's generalizability is strengthened since the trends were similar across three different homecare systems.

To our knowledge, this is the largest cancer sample to examine general end-of-life homecare use across multiple homecare systems. To improve end-of-life cancer care and system efficiency, health systems should consider training more generalist homecare nurses to manage primary-level palliative care needs as well as specialist palliative care nurses to manage complex symptoms.

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