

Factors Associated with Pressure Ulcers in Palliative Home Care

PETER BRINK, M.A., Ph.D. (Cand.),¹ TREVOR FRIES SMITH, Ph.D.,¹
and BARBARA LINKEWICH, R.N., HBScN(C), IBCLC²

ABSTRACT

Background: Studies have identified factors associated with pressure ulcers in many health care settings including acute care, complex continuing care, long-term care, and home care.

Objective: The purpose of this study was to identify factors associated with pressure ulcers among palliative home care clients. Identifying associations specific to each setting is important for ulcer prevention and has implications for clients overall well-being and quality of life.

Methods: The study included all palliative home care clients diagnosed with terminal cancer from one palliative home care agency in Ontario. Information on health was gathered using the interRAI instrument for palliative care.

Results: The study found male gender, the inability to lie flat because of shortness of breath, catheter, or ostomy care, and a reduced ability to perform activities of daily living to be associated with pressure ulcers.

Significance of results: In some instances, treatment and prevention of pressure ulcers is the primary goal of care. However, pressure ulcers are also suggestive of deterioration and considered as a part of the disease trajectory. Sometimes the primary goal of care of treatment and prevention is displaced by a greater need for comfort.

INTRODUCTION

PALLIATIVE CARE is appropriate for anyone living with, or at risk of developing a life-threatening illness. It aims to relieve suffering and improve quality of living and dying. It addresses physical, psychological, social, spiritual, and practical issues, and their associated expectations, needs, hopes, and fears. It also serves to treat all active issues and prevent new issues from occurring, including wound care.¹

A pressure ulcer results from prolonged pressure on human tissue that causes the tissue to

breakdown. Pressure ulcers are categorized into four stages: stage I describes any area of persistent skin redness, stage II includes the partial loss of skin layers, stage III characterizes deep craters in the skin, and stage IV, the most serious, typifies exposure of muscle and/or bone.²

Identifying factors associated with pressure ulcers is important for treatment and prevention. Pressure ulcers occur within all health care settings, including acute care, complex continuing care, long-term care, home care, and palliative care. Prevalence rates for pressure ulcers vary according to each health care setting. Prevalence

¹Department of Health Studies and Gerontology, University of Waterloo, Waterloo, Ontario, Canada.

²Northwestern Ontario Pain & Symptom Management Team, Thunder Bay Community Care Access Center, Thunder Bay, Ontario, Canada.

rates for pressure ulcers in palliative home care are as high as 26.9%.³ Within the general home care setting, pressure ulcers are associated with recent institutional discharge, functional impairment, incontinence, and a history of pressure ulcers.⁴ Factors associated with pressure ulcers among home care clients include inactivity (including wheelchair use), poor activities of daily living, incontinence (bowel and urinary), limited mobility, anaemia, male gender, recent fracture, oxygen use, and skin drainage.⁵

Pressure ulcers have implications for the client's well-being and quality of life. For example, having a pressure ulcer, independent of severity, places long-term care residents at higher risk of death⁶ and recent admission to or discharge from intensive care places patients at higher risk of developing pressure ulcers.⁷ This has implications for palliative home care where it is plausible that pressure ulcers are an indicator of overall deterioration or considered a part of the disease trajectory.

The repercussions pressure ulcers can have for informal caregivers are great and include higher levels of skilled care and greater need for formal care. In palliative care, prevention is essential because treatment is often painful.⁸ In addition, the benefits of treatment must be carefully weighed against patient comfort level and quality of life.

Conditions associated with single position comfort can cause intense pain that may impede pressure ulcer treatment and prevention within both hospital and hospice settings. Clay⁹ observed that even when pain is not an issue, "it is difficult to meet repositioning requirements even under normal circumstances, with full staffing, so envision trying to reposition patients properly that schedules fewer staff." This suggests that meeting acceptable care and comfort requirements may be difficult for informal care providers providing in-home palliation. Bick and Stephens¹⁰ concluded that "patients and carers should receive appropriate information on pressure ulcer risk assessment and prevention."

This paper is a retrospective exploratory study. Its purpose is to identify factors associated with pressure ulcers among palliative home care clients whose prognosis is greater than 6 weeks. To our knowledge, few studies have identified factors associated with pressure ulcers within this health care setting.

METHODS

Participants

The study sample included all home care clients diagnosed with terminal cancer receiving palliative home care from one of Ontario's Community Care Access Centres (CCACs). In Ontario, a Province of Canada, home care delivery is coordinated by the CCACs to coordinate in home services and ensure timely access when needed.

Health information from 561 home care clients were gathered using the interRAI instrument for palliative home care.^{2,11,12} The information was collected between March 2002 and December 2004. The sample population included 49% ($n = 277$) males and 51% ($n = 281$) females (3 missing) with a prognosis of 6 weeks or longer. The average age was 69 years (males = 68.7, standard deviation [SD] = 13.24; females = 69.3, SD = 13.52).

Instrument

The interRAI PC is an instrument designed to provide a comprehensive assessment of palliative care clients. It includes a number of domains such as psychological, physical, social, and spiritual well-being.^{2,11,12} interRAI is a nonprofit organization that involves an international assortment of clinicians, researchers, policy, and government persons. The interRAI PC is only one of a suite of instruments designed to encompass a host of health care settings such as long-term care, complex continuing care, home care, mental health, and community health. interRAI instruments, such as that used by complex continuing care, are currently mandated for use in parts of Canada, the United States, and other countries.

A number of embedded scales included in interRAI instruments are included in the interRAI PC. Scales measure cognition (Cognitive Performance Scale, CPS),¹³ activities of daily living (Activities of Daily Living-Hierarchy Scale)¹⁴; depression (Minimum Data Set-Depression Rating Scale)¹⁵; and pain (Pain Scale).¹⁶

Cognitive Performance Scale. The CPS¹³ includes four items embedded within the interRAI-PC instrument. Categories are based on an algorithm that places individuals into seven groups (0 = intact, 1 = borderline intact, 2 = mild impairment, 3 = moderate impairment, 4 = moderate/severe impairment, 5 = severe impairment, 6 = very se-

vere impairment). The algorithm uses items that measure decision-making skills, memory ability, and level of understanding. Existing research demonstrates the CPS provides an accurate assessment of cognition among institutionalized populations.¹⁷

Activities of Daily Living-Hierarchy Scale. The ADL-H¹⁴ determines the degree of assistance required to perform ADL. The ADL-H scale uses four items embedded within the interRAI PC. It includes seven categories (0 = independent, 1 = supervision, 2 = limited, 3 = extensive-1, 4 = extensive-2, 5 = dependent, and 6 = total dependence). Items used in the ADL-H algorithm include eating ability, personal hygiene, ability to toilet oneself, and locomotion.

Minimum Data Set-Depression Rating Scale. The MDS-DRS¹⁵ was developed to identify possible

cases of minor or major depression. It uses seven items within the interRAI PC. Scores from the seven items are cumulative. The scale ranges from 0 to 14. Higher scores indicate higher depressive severity. Previous research in sensitivity and specificity indicates that a score of three or greater is considered high risk for a major depressive episode. The MDS-DRS has been validated against both the Hamilton Depression Scale and the Cornell Scale for depression.

Pain Scale. The interRAI Pain Scale¹⁶ uses items in the interRAI-PC to measure the frequency and intensity of pain. Its purpose is to better able clinicians to identify and treat pain. The pain scale has been validated against the visual analogue scale for pain.¹⁶

Pressure Ulcer. Pressure ulcers were recorded by care coordinators using the interRAI PC. The

TABLE 1. HEALTH CONDITIONS ASSOCIATED WITH PRESSURE ULCER DEVELOPMENT

Characteristic	All patients (n)		Pressure ulcer		Analysis χ^2 (df = 1)	p
	No	Yes	No (n)	Yes (n)		
Gender	Female	275	254	21	5.702	0.017
	Male	271	234	37		
Bladder Incontinence ^a	No	474	434	40	12.103	0.001
	Yes	62	48	14		
Bowel Incontinence ^b	No	489	446	43	12.214	< 0.001
	Yes	43	32	11		
Catheter or ostomy	No	515	468	47	13.051	< 0.001
	Yes	21	14	7		
New Pain Site	No	494	446	48	6.324	0.012
	Yes	48	31	9		
Shortness of Breath	No	286	263	23	4.834	0.028
	Yes	251	216	35		
Inability to Lie Flat	No	399	369	30	16.417	< 0.001
	Yes	129	103	26		
Insufficient nutritional intake	No	340	311	29	4.807	0.028
	Yes	160	136	24		

Characteristic	All patients (n)		Pressure ulcer		Yes (n)		F	df	p
	Mean	SD	Mean	SD	Mean	SD			
Age	69.03	13.21	68.63	13.27	72.56	12.42	4.422	1	0.036
ADL-H ^c	1.07	1.63	0.90	1.51	2.57	1.94	52.423	1	< 0.001
CPS ^d	0.39	0.94	0.33	0.84	0.95	1.46	22.126	1	< 0.001

^aBladder incontinence—any record of bladder incontinence.

^bBowel incontinence—any record of bowel incontinence.

^cActivities of Daily Living—Hierarchy Scale (seven levels).

^dCognitive Performance Scale (seven levels).

SD, standard deviation.

care coordinator is instructed to ask the client whether an ulcer has occurred. The care coordinator reviews medical information to determine the location and possible stage of the ulcer(s).² If an ulcer is detected, the care coordinator consults with the visiting nurse to determine the stage of the pressure ulcer and then records the most severe stage of ulcer when more than one is present.

Prognosis. Prognosis was determined by CCAC case managers who used information from the client, his/her family, formal caregivers, and the client's existing clinical record (if available) to estimate the expected remaining length of life.² The original interRAI PC lists four coding options for the rating of prognosis: death is imminent or within days; less than 6 weeks; 6 weeks or more but less than 6 months; and 6 months or more. This study only included clients whose estimated length of life was 6 weeks or longer.

Analysis

All data analyses were performed using SPSS version 11.0 (SPSS, Inc., Chicago, IL). A series of independent χ^2 and *t* tests between means were used to determine association with pressure ulcer development. Associations were tested with a number of variables representing health conditions commonly found in palliative home care. Further analyses used binary logistic regression to determine factors associated with pressure ulcers.

RESULTS

A reliability analysis of the embedded scales was performed. The scales produced acceptable α (CPS $\alpha = 0.79$, ADL-H = 0.84, MDS-DRS $\alpha = 0.59$, and Pain Scale $\alpha = 0.86$).

First, the prevalence of pressure ulcers was examined. Data show that 10.5% (59/549 clients) of palliative home care clients were identified as having at least one pressure ulcer. Of those clients with pressure ulcers, 51.7% ($n = 31$) were classified as stage I, 33.3% ($n = 20$) as stage II, and 13.3% ($n = 8$) stage III. None of the clients were associated with stage IV ulcers. Frequency of pressure ulcers was recorded, 4.4% recorded at least 1 pressure ulcer and 7.8% recorded multiple

pressure ulcers, information was missing in 2.1% of the clients.

Table 1 reports bivariate and continuous variables significantly associated with pressure ulcer(s). Significant variables included gender, urinary incontinence, bowel incontinence, catheter and ostomy care, new pain site, shortness of breath, inability to lie flat because of shortness of breath, insufficient nutritional intake, age, poor cognition, and poor activities of daily living. Health conditions not associated with pressure ulcers are reported in Table 2.

Variables significantly associated with pressure ulcers were entered into a logistic regression model with pressure ulcer (yes, no) as the dependent variable. Variables reported in Table 1

TABLE 2. HEALTH CONDITIONS NOT RELATED TO PRESSURE ULCERS

Variable (description)	Variable (description)
Prognosis (greater than 6 weeks or less than 6months)	Constipation (yes, no)
Ostomy (Bowel incontinence)	Fecal impaction (within last 3 days)
Bone pain (yes, no)	Diarrhea (within last 3 days)
Muscle pain (yes, no)	Vomiting (within last 3 days)
Neuropathic pain (yes, no)	Nausea (within last 3 days)
Visceral pain (yes, no)	Difficulty coughing (within last 3 days)
Falls (any within last 90 days)	Tired easily (within last 3 days)
Ascites (within last 3 days)	Sleep problems (within last 3 days)
Pleural effusion (within last 3 days)	Muscle cramps (within last 3 days)
Fatigue (within last 3 days)	Edema (within last 3 days)
Dry mouth (within last 3 days)	Modified mode of nutritional intake (Any modification)
Hiccups (within last 3 days)	Major skin problems (Burns, surgical wounds, lesions)
Offensive odor (within last 3 days)	Skin tears or cuts (yes, no)
Pain scale (Any pain)	Change in skin condition (bruises, rashes, itching, mottling, herpes zoster, eczema)
Depression Rating Scale (Any)	

All health conditions listed in this table were not significant to the $p = 0.05$ level.

were entered concurrently. A variable whose confidence interval did not include 1.0 was considered a significantly associated with pressure ulcers. The final model (Table 3) found gender (male), the inability to lie flat because of shortness of breath, catheter or ostomy care, and poor ADL to be independent factors associated with pressure ulcers.

DISCUSSION

The purpose of this study was to identify factors associated with pressure ulcers among clients receiving palliative home care. To the authors' knowledge, little research has examined the associates of pressure ulcers in the palliative home care setting. This study found that factors associated with pressure ulcers were gender, the inability to lie flat because of shortness of breath, catheter or ostomy care, and poor ADL.

Men were more likely to develop pressure ulcers. In fact, the log odds were greater than two times that of women. The reason for this is unclear but higher rates of pressure ulcer development among men might reflect gender differences in care requirements. For example, men may be more difficult to maneuver when repositioning or they may be less willing to admit need

for additional formal care. Men may also receive care in their home longer, leading to a higher level of care in response to disease progression. These reasons may allow the care requirements of palliative home care recipients to exceed the skill and comfort level of their informal caregivers.

The inability to lie flat because of shortness of breath places home care clients at risk for pressure ulcers and is a health condition found among a quarter of all palliative home care clients. Single position comfort is an important issue in palliative care and is associated with incident pain, bone metastasis, pathological fractures, pulmonary disease, and sacral plexus invasion.¹⁸ Turning and repositioning prevents pressure ulcer formation but sometimes pain severity restricts prevention techniques. Among clients who are actively dying, treatment and prevention of ulcers might be displaced when the primary goal of care becomes comfort.

Earlier research shows that wetness from urinary incontinence is associated with, or is a risk factor for tissue breakdown and pressure ulcer development.^{19,20} This study found a bivariate association between urinary incontinence and pressure ulcers. Even though urinary incontinence was not associated with pressure ulcers in the multivariate model, clients who used catheter or ostomy care were over 4 times more likely to experience one or more ul-

TABLE 3. LOGISTIC REGRESSION OF PRESSURE ULCERS (NOT PRESENT/PRESENT) ON PREDICTOR VARIABLES

<i>Variable (reference group)</i>	<i>Parameter estimate</i>	<i>SE</i>	<i>Odds ratio</i>	<i>Confidence interval</i>
Gender (female)	0.814	0.410	2.258	1.010–5.055
New pain site (no)	0.726	0.626		
Shortness of breath (no)	0.134	0.441		
Inability to lie flat (no)	0.914	0.449	2.493	1.035–6.007
Evidence of wasting (no)	0.640	0.399		
Bladder incontinence (no)	0.583	0.568		
Catheter or ostomy (no)	1.469	0.730	4.345	1.040–18.163
Bowel incontinence (no)	0.558	0.660		
Age	0.004	0.015		
Problems with ADL	0.331	0.118	1.393	1.105–1.756
CPS	0.174	0.180		
Intercept	–4.484	1.128		

ADL, activities of daily living; CPS, Cognitive Performance Scale; SE, standard error.

cers. Catheter and ostomy care may be associated with urinary incontinence and indicative of advanced disease progression. For example, catheter use among clients with advanced terminal disease may be used as a method to maintain a higher level of comfort when pain severity limits movement.

Poor ADL increases the likelihood of developing pressure ulcers among palliative home care clients for a number of reasons. First, reduced performance in ADL reflects poor mobility and a lower capacity for self-care. In addition, physical deterioration is often a consequence of the disease progression. The relationship between ADL and pressure ulcer found in this study is in line with earlier studies that have identified a relationship between immobility and pressure ulcer development.^{4,5}

This study found no stage IV ulcers in the patient population. This likely reflects the characteristics of the palliative home care program. This program includes comprehensive holistic assessment, interdisciplinary palliative team coordinated care, psychosocial/spiritual support and counseling, and caregiver relief/in-home respite care. The care team includes care coordinators, palliative care physicians, nurse practitioners, and spiritual care consultants. Although other CCACs have similar programs, it is unknown how representative of the other 42 CCACs this patient population is. A next step may be to examine the possible differences between the CCACs.

Limitations of this study include the specific focus on clients with terminal cancer whose prognosis is greater than 6 weeks. Because palliative home care is offered to all clients suffering terminal illness, regardless of prognosis or type of disease, it is difficult to generalize our findings to all palliative clients. This study is also limited by its retrospective use of cross-sectional data. The next step in pressure ulcer research should use a prospective design that includes all palliative home care clients.

Despite the limitations, this study outlines the factors associated with pressure ulcer development among palliative home care clients suffering terminal cancer. Issues related to care techniques differ significantly among health care settings. For example, the "inability to lie flat due to shortness of breath" occurred in 24% of palliative home care clients. This type of example is more likely to occur in palliative care.

CONCLUSION

Symptoms that contribute to pressure ulcer development may be a consequence of terminal disease and/or the dying process. Even though fewer ulcers develop by adopting proper care procedures like repositioning and better catheter/ostomy care, informal caregivers may lack the resources and skills necessary to cope with the increased demands of care. Also, when levels of comfort are compromised by treatment and prevention techniques, the goal of care may shift away from treatment and prevention. Turning, repositioning, and pressure ulcer care become more painful toward end of life and the goal may shift to increase comfort level.²¹ However, when this transition occurs must be determined by the client. The principles of palliative care point out that it is the patient's right to make informed decisions and to determine their goals of care.¹

The combination of the health conditions that place clients at greater risk of pressure ulcers may represent physical deterioration among palliative home care clients. In the context of home care, a pressure ulcer can affect informal caregivers negatively. They may experience guilt and a sense of failure in their care giving abilities.¹⁸ They must also perform the additional task of dressing and caring for the pressure ulcer. Formal caregivers are less likely to view pressure ulcers as a sense of failure but as an inevitable consequence of the terminal illness. They realize that an ulcer may not be an indication of poor care but a sign of a client's frail and terminal condition.

This study points to the need for close monitoring of pressure ulcer development among palliative home care clients because patients with terminal cancer may be at higher risk for pressure ulcers when specific health problems are present. This makes appropriate, and often costly, prevention and detection strategies advantageous to those clients identified to benefit.

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Address reprint requests to:

Peter Brink, M.A.

Department of Health Studies and Gerontology
University of Waterloo
200 University Avenue
Waterloo, Ontario, N2L 3O1
Canada

E-mail: pbrink@ahsmail.uwaterloo.ca

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