

Pressure ulcers in home care settings: is it overlooked?

Asimus M & Li P

Abstract

The frequency of pressure ulcers in patients living at home is not well-defined. To quantify the extent of this issue, surveillance was conducted in 2009 within 45 community health sites across the Hunter New England Area Health Service of New South Wales (NSW). This is the first community pressure ulcer prevalence study completed in NSW. Seven hundred and ninety-six randomly selected patients cared for by community nurses participated in the study. A pressure ulcer prevalence rate of 8.9% (n=71, 95% CI=7.1–11.1%) was recorded, 6.5% (n=52, 95% CI=5.0–8.5%) if stage I pressure ulcers were excluded. A total of 111 pressure ulcers were identified on 71 clients, with 35.3% of the patients classified as high risk of developing pressure ulcers. Of the patients with pressure ulcers, 40.8% developed the ulcers during their care by community nursing staff. Similar portions of patients acquired their ulcers during hospitalisation or before admitted to the community nursing services. Issues requiring action from the survey include improving documentation of risk, improving speed and access to pressure redistributing devices, which were absent in 50% of the patients with pressure ulcers.

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Funding: Nursing and Midwifery Services, Hunter
New England Area Health Service

Introduction

The burden of pressure ulcers is enormous and detrimental to the patients, carer and health care system. The social costs for individuals include pain, decreased mobility and social isolation¹. In addition, the financial cost of treating pressure ulcers is escalating. A report indicated pressure ulcers are the most expensive medical error in USA, costing US\$3.9 billion per year². An Australian study estimated pressure ulcers extended the length of stay within the Australian public hospital system, at a mean cost of A\$285 million a year³. However, this estimate did not include the additional expense of community nursing care once patients are transferred home.

Pressure ulcer prevalence has been measured in hospitals and nursing home settings both internationally and nationally, but in Australia it has not been measured in the home care setting. Prevalence rates in home care patients identified in Belgium and USA were 6.8%⁴ and 9.1%⁵ respectively. A study conducted in Western Australia (WA) reported a prevalence rate of 19% in those high-risk home care patients⁶. However, there are no reports on the prevalence of pressure ulcers on the large population of patients living at home and receiving community nursing care. Focus has often been placed on hospital-acquired pressure ulcers and there has been a

perception that pressure ulcers only occur in hospitals or aged care facilities. However, more patients are being discharged after acute symptoms have been managed but with a pressure ulcer to recover in their home with support from community-based services. Therefore, it was decided to investigate the prevalence and sources of pressure ulcers in community patients. In this study, three main sources of pressure ulcers were identified: acquired during hospitalisation, developed in the community prior to the community nursing care and developed during community nursing care.

The aims of our study were to:

1. Quantify the prevalence of pressure ulcers in patients living at home.
2. Determine the sources of pressure ulcers in patients living in the community.
3. Investigate the level of pressure ulcer prevention intervention and management implemented.

4. Investigate the accessibility of pressure redistributing devices and nursing documentation.

Method

Study design and setting

The study used a cross-sectional survey design. Prevalence is the total number of existing cases of a particular disease or condition among in the population at a given time. Prevalence includes all patients with a particular condition, regardless of whether it developed during or prior to an episode of care⁷.

The survey was conducted in a primary health care setting of an area health service located in New South Wales (NSW). Community nurses provide care to approximate 2100 people living in regional and rural areas every month.

Population and sample

To ensure an adequate sample of patients living in all regional and rural clusters were surveyed, a sample size of 800 patients was required. Sample populations were proportionate

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Table 1. Pressure ulcer staging system¹⁰.

Stage I: Non-blanchable erythema	Stage II: Partial thickness	Stage III: Full-thickness skin loss	Stage IV: Full-thickness tissue loss
Intact skin with non-blanchable redness of a localised area usually over a bony prominence. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue.	Partial thickness loss of dermis presenting as a shallow open ulcer with a red-pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.	Full-thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle is not exposed.	Full-thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present.

according to the size of the patient population of each community sites (n=45). A random sample of community patients was selected from an electronic community patient database. The inclusion criteria were consenting community patients currently receiving community nursing services at home. Patients on the community health database were excluded from the study if they were only receiving dietician or physiotherapy consultations.

Data collection time frame

Data was collected over a four-week period commencing in October 2009.

Data collection tool

Two data collection tools were developed by the Pressure Ulcer Prevention Programme (PUPP) research team, which included a nurse practitioner in wound management, PUPP officer and an administrative support officer. The tools were tested in a pilot study and consultation was sent from allied health, wound management professionals and statisticians.

The surveyors (community nurses) collected data for Part 1 and assessed each consenting patient with the Waterlow risk assessment tool⁸. Part 2 data was collected by the research team through accessing Community Health Information Management Enterprise (CHIME), an electronic database where medical records of all community patients are entered.

Part 1. The community nurse survey tool captured the following key data points:

- Demographics such as age, gender, living with carer or not.
- Preventive measures: the use and waiting time of pressure redistributing devices.
- Evidence of pressure ulcer, including anatomical location and severity by skin inspection.

- The source of pressure ulcer: acquired during hospitalisation, developed in the community prior to the community nursing care and developed during community nursing care.

- If patients have received any education on pressure ulcers.

- Risk profiles.

Part 2. The CHIME audit tool captured the following key data points:

- Documentation of risk assessment.
- Staging of pressure ulcers by the digital image.

Training

Community nurses participated as surveyors. Prior to the survey, all surveyors were requested to undertake the Area Health Service Online Pressure Ulcer Education Modules, which was developed by Area Health Pressure Ulcer Prevention Programme Education Subcommittee. Training in pressure ulcer risk assessment was also included in the online programme. All surveyors were also required to pass an assessment on severity classification of pressure ulcers, which consisted of multiple choice questions and severity categorisation of 16 pressure ulcer photos. The process was similar to that initiated by Prentice⁹ for the Victorian PUPP.

Before the survey, the aim and procedure of the study were presented to senior managers and information sheets were issued to 45 community health centres.

Pressure ulcer classification

The National Pressure Ulcer Advisory Panel (NPUAP) classification for pressure ulcers was adopted (Table 1). For the purpose of this study, pressure ulcers with necrotic area or slough that obscure the depth of the tissue will be staged as stage IV.

Data collection procedure

Part 1 of the survey was conducted by community nurses during their routine home visit. The purpose and the requirements of the survey were explained during the visit. After verbal consent was obtained, the community nurse then proceeded with the skin inspection, risk assessment and completion of the survey. As pressure ulcers were identified, digital photographs were taken by community nurse and these were uploaded to a community patient electronic record.

Part 2 of the survey commenced once the Part 1 community nurse survey forms were returned to the PUPP research team. The research team audited the nursing documentation recorded in CHIME to determine of level of risk assessment. A nurse practitioner in wound management verified the staging of pressure ulcers by viewing the digital image uploaded to the community patient record database.

Data management

All completed survey forms and risk assessment forms were verified and entered to an Access database. Data was then cleaned and analysed. Confidence intervals were calculated



Figure 1. Risk level assessed by surveyors.

by GraphPad Software™ via the internet. All results were presented in descriptive form.

Ethical considerations

The prevalence survey was approved by the Hunter New England Human Research Ethics Committee. All participants were fully informed of the survey requirements before verbal consent was requested. Participants were also aware that each data set would be anonymous. Approval was given by the Ethics Committee for verbal consent from a patient or patient’s carer.

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WC 126-02-11

Table 2. Demographics.

Variable	Number of patients (%)	Patients with pressure ulcers	Prevalence (%) in subgroup
Gender			
Male	371(46.6%)	38	10.2%
Female	425(53.4%)	33	7.8%
Total	796(100%)	71	8.9%
Age (Year)			
<30	13(1.6%)	2	15.4%
30–39	13(1.6%)	3	23.1%
40–49	31(3.9%)	3	9.7%
50–59	69(8.7%)	10	14.5%
60–69	129(16.2%)	12	9.3%
70–79	218(27.4%)	15	6.9%
80–89	247(31.0%)	21	8.5%
90–99	76(9.5%)	5	6.6%

Results

Demographics and participation rate

A total of 796 (99.5%) patients living at home in the community, across 45 community health sites, participated in the survey. Four (0.5%) patients did not consent to participate. As shown in Table 2, subjects (male, n=371; female, n=429) match the same as that in Table 2 and ranged in age from 15 to 98 years, with a median age of 64 years. Five hundred and forty-one (68.0%) participants were aged 70 or above, with 38.1% (n=303) living with a carer. As demonstrated in Figure 1, a total of 35.4% of the patients (n=282) were classified as High Risk or above.

Pressure ulcer prevalence in the community

The prevalence of pressure ulcers in patients living at home was 8.9% (n=71, 95% CI=7.1–11.1%), 6.5% (n=52, 95% CI=5.0–8.5%) when stage I pressure ulcers were excluded. As shown

in Table 3, 55% (n=33) of patients were recently discharged from hospital with pressure ulcers. Of the patients living with carers, 10.9% (n=33) were identified having pressure ulcers, whereas 7.7% (n=38) in those living on their own. Our results show that lack of mobility was a significant factor in the prevalence of pressure ulcers: 31% (n=13) of the chair-bound patients and all (n=2) bed-bound patients developed pressure ulcers (Table 3). From data collected by community nurses during a home visit, 28.2% of the patients living at home with pressure ulcers acquired the ulcer during hospitalisation, while the majority (71.8%) developed pressure ulcers in the community (Figure 2).

Distribution and severity of pressure injuries

Table 4 presents the number and percentage of pressure ulcers according to severity and anatomical location. A total of 111 ulcers were identified on 71 patients. Stage II pressure ulcers accounted for 40.5% of all the ulcers, followed by stage I pressure ulcers (29.7%). The most common anatomical site affected by pressure ulcers was the heel (33.3%). Nearly 70% of ulcers identified by community nurses were caused solely by the devices the patients were using such as nasal prongs, prosthesis, catheters, shower chair and splints and so on.

Prevention intervention

Several issues relating to care were examined. These included repositioning, pressure ulcer risk assessment, pressure relieving and comfort devices, and patient education.

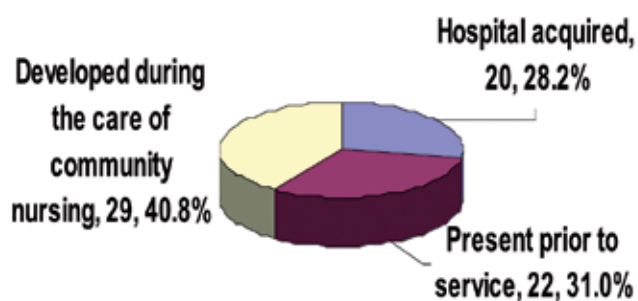


Figure 2. Sources of pressure ulcers in number of patients.

Repositioning

A large proportion of patients (91.3%) were independent in repositioning, while about 9% (n=69) required help to sit up or roll in bed with three of the carers being unable to assist. A majority (n=44) of those 69 patients did not have a regular reposition regime.

Pressure ulcer risk assessment

Only 35.7% (n=284) of the patients were risk-assessed on admission to community nursing services. Of the patients, 18.6% were not risk-assessed for more than one month. There was no evidence of risk assessment in 64.3% (n=512) of the patients, though 10.2% (n=52) of them were identified suffered from pressure ulcers. Risk reassessment recorded on any patient was not identified on any surveyed patients.

Pressure relieving and comfort devices

Patients were assessed by surveyors with the Waterlow risk assessment tool⁸ on survey day; 3.7% (n=9) of the patients identified as not at risk had pressure ulcers. As shown in Table 5, although 23.1% of the very high risk patients (n=121)

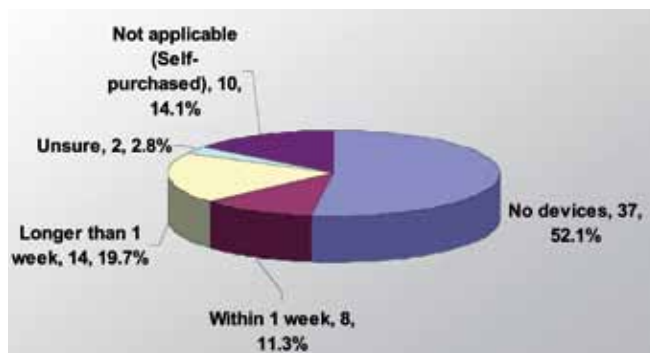


Figure 3. Devices waiting times for patients with pressure ulcers.

had pressure ulcers, only 4.1% and 17.4% of them had pressure redistributing devices applied in the bed and chair respectively.

Out of 238 pressure redistributing and comfort devices, 32.4% (n=78) were prescribed by occupational therapists, whereas only 8.8% (n=21) by community nurse. Of the devices, 55.5% were self-prescribed, including heel or elbow protector, egg crate mattress or cushion, foam overlay and sheepskin. Eighty-five devices (35.7%) were provided by

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Table 3. Pressure ulcer prevalence by risk factors.

Variable	Number of patients (%)	Patients with pressure ulcers	Prevalence (%) in subgroup
Living with carer			
Yes	303(38.1%)	33	10.9%
No	493(61.9%)	38	7.7%
Discharged from hospital within last two weeks			
Yes	60(7.5%)	33	55%
No	736(92.5%)	38	5.2%
Body build			
Average	338(42.5%)	34	10.1%
Above average	214(26.9%)	14	6.5%
Obese	171(21.5%)	15	8.8%
Below average	73(9.2%)	8	11.0%
Continence			
Complete/catheterised	674(84.7%)	56	8.3%
Urine incontinence	90(11.3%)	10	11.1%
Faecal incontinence	16(2.0%)	1	6.3%
Double incontinence	16(2.0%)	4	25%
Mobility			
Fully	539(67.7%)	27	5.0%
Restless	24(3.0%)	1	4.2%
Apathetic	29(3.6%)	5	17.2%
Restricted	160(20.1%)	23	14.4%
Bed-bound	2(0.3%)	2	100%
Chair-bound	42(5.3%)	13	31.0%
Nutrition			
Adequate	618(77.6%)	51	8.3%
Weight loss or lost appetite	178(22.4%)	20	11.2%

suppliers such as Hunter Equipment Service, NSW Enable or other suppliers. Within this group, approximate 33% (n=28) patients waited longer than one week to receive equipment. Figure 3 illustrates the waiting time of pressure relieving devices in those patients suffering from pressure ulcers. Of the patients identified having pressure injury, 52.1% had no pressure relieving devices in place.

Patient education

Of 282 patients classified as high or very high risk of developing pressure ulcers, only 48.9% (n=138) received verbal or written information about pressure ulcer prevention and management. Of those 71 patients suffered with pressure ulcers, 67.6% (n=48) of them had received education.

Discussion

Prevalence

The prevalence of pressure ulcers identified in the community study was 8.9%. Consent was obtained from 98.5% of participants. Prevalence studies conducted in nursing home residences¹¹ and home-based patients in WA⁶ showed rates of 15.8% and 19% respectively. As there has been no reported study like ours, it is hard to compare the prevalence rates.

Consistent with literature^{12,13}, increasing age and decreased mobility are major risk factors of pressure ulcers. Also, our data shows that being recently discharged is a significant characteristic of patients with pressure ulcers.

Table 4. Anatomical distribution and severity of pressure ulcers.

Anatomical location	Stage I	Stage II	Stage III	Stage IV	Total (%)	Device-related ulcers (% within subgroup)
Ischium	0	0	2	1	3(2.7)	2(66.7)
Elbow	4	1	0	0	5(4.5)	3(60)
Ear	5	1	0	0	6(5.4)	4(66.7)
Trochanter	3	1	2	1	7(6.3)	3(42.9)
Sacrum	7	10	0	2	19(17.1)	13(68.4)
Heel	6	18	9	4	37(33.3)	22(59.5)
Other	8	14	10	2	34(30.6)	29(85.3)
Total	33	45	23	10	111(100)	76(68.5)

Sources of pressure ulcers in the community

The source of the pressure ulcers was estimated by the surveyor enquiring with the patient and auditing the nursing documentation in the CHIME. A majority of the patients identified as suffering from a pressure ulcer developed the ulcer in the community (71.8%). Where hospital-acquired pressure ulcers are often related to the quality of care provided to patients¹⁴, it may not fully apply in community-

acquired pressure ulcers, as the patients are not being cared for by a community nurse 24 hours a day.

Distribution and severity of pressure ulcers

All the pressure ulcers and the severity were verified by auditing nursing documentation. Thirty pressure ulcers were identified incorrectly; for example, diabetic foot ulcers and venous leg ulcers were misidentified as pressure ulcers or

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Table 5. Risk level and pressure-redistributing devices.

	Not at risk	At risk	High risk	Very high risk	Missing data
Number of patients	242	249	161	121	23
Patients with pressure ulcers (%)	9(3.7%)	17(6.8%)	15(9.3%)	28(23.1%)	2(8.7%)
Dynamic air mattress applied (%)	1(0.4%)	2(0.8%)	5(3.1%)	5(4.1%)	2(8.7%)
Dynamic air or Roho cushion applied (%)	0	9(3.6%)	15(9.3%)	21(17.4%)	4(17.4%)

the severity of the pressure ulcers were staged incorrectly. In some cases, digital wound images were not uploaded to the database by community nurses. The PUPP team relied on patients' history and wound description in the documentation for this purpose

During the survey, community nurses have identified nearly 70% of the pressure ulcers were caused solely by devices that the patients were using such as prostheses, catheters, shower chairs and so on. A large proportion of device-related pressure ulcers were found on the spinal processes, sacrum and heel. Therefore, it is important to provide patient education on prevention intervention on device-related pressure ulcers when equipment is installed by health professionals.

Heel pressure ulcers accounted for the highest proportion of all the ulcers (33.3%), which was followed by sacrum ulcers (17.1%). This study also shows all the bed-bound and 31% of the chair-bound patients suffered from pressure ulcers. These findings explain the reasons why the majority of pressure ulcers were found on sacrum and heels. Therefore, repositioning should be reinforced to patients and carers to reduce the prevalence of these ulcers.

Prevention intervention

Pressure ulcer risk assessment identifies the level of risk the client has of developing a pressure ulcer. Electronic nursing documentation audit revealed only 35.7% of the patients were risk assessed with the Waterlow risk assessment tool⁸ on admission to community nursing services and no reassessment evidence was found on any patient, even those identified as very high risk of developing pressure ulcers or those who had been prescribed pressure relieving device(s).

Only a small percentage of high risk and very high risk patients were prescribed alternating air mattress (3.5%) or air cushions (13.5%). This may be due to the infrequent risk assessment and staff not being aware of the change in a patient's risk level. Excluding self-purchased equipment, 32.9% of the pressure redistributing devices was delivered

to the patients more than one week after the assessment. Approximately 19% of the patients with pressure ulcers waited longer than one week for equipment from NSW Enable or the Area Health Equipment Service. In addition, there was no device in situ for 52% of the patients identified with pressure ulcers. Delay in accessing equipment and patient risk reassessment is an area identified for quality improvement.

Limitations

A major limitation of generalisability of the findings of this study was that the study was conducted with patients living at home and cared for by community nurses.

A second limitation was that the patients were surveyed by community nurses caring for them, rather than independent surveyors. Access to limited resources and the diversity of the geographical locations meant it was not possible to hire external surveyors. However, the benefit was a high client consent rate. The validity of the study was reinforced by random client selection and the trained and experienced project team viewing the wound digital images and auditing nursing electronic records. In the situations where wound image were unavailable, the severity of the pressure ulcers was based on the wound diagnosis or descriptions documented in the electronic nursing progress notes.

Conclusions

This first large-scale pressure ulcer prevalence survey was conducted in a home-based setting in a regional and rural area in NSW. The risk factors identified in this study are increasing old age, poor mobility and recent discharge from hospital. In addition, this study has revealed a gap between evidence-based practice and current clinical practice supported by high rates of no risk assessment and poor accessibility of equipment. Strategies targeting those findings have been implemented in some of the community settings. These strategies included reinforcing the Pressure Ulcer Prevention and Management Policy, especially risk assessment; raising

the staff's and patient's awareness of device-related pressure ulcers, the purchase of additional pressure redistributing devices and client pressure ulcer education. We would recommend further studies on patients living at home and receiving services from other health professionals such as general practitioners and allied health staff.

Acknowledgements

We acknowledge the support from the programme's executive sponsor the Director of Nursing and Midwifery Services, Chris Kewley, HNE Health Pressure Ulcer Prevention Program Committee, Primary and Community Health Networks Director, Cluster General Managers, Senior Nurse Managers, all Community Nurses (surveyors) from Primary and Community Health Networks and the Community Health Information Management Enterprise (CHIME) Team in Hunter New England Area Health Service.

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Expression of Interest

The Skin Tear Audit Research (STAR) Project team wishes to build on and further extend a program of research that they began four years ago which resulted in the development of the STAR Skin Tear Classification System. A recently completed case control study by the investigators identified that five skin characteristics constituted the optimum model for predicting skin tear development. We propose to develop a tool that can reliably assess the presence (and, where appropriate, the degree) of these characteristics and then test its ability to accurately predict who subsequently develops a skin tear. The STAR team is asking for expressions of interest from clinicians with expertise or interest in skin tears to participate in a number of teleconferences to achieve consensus on how the characteristics can be assessed and how the tool needs to be constructed.

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