



**WOCN**<sup>®</sup> Wound, Ostomy, and  
Continence Nurses Society<sup>®</sup>

# **EFFECTIVENESS OF WOUND, OSTOMY, AND CONTINENCE NURSES ON AGENCY-LEVEL WOUND AND INCONTINENCE OUTCOMES IN HOME CARE**



PROFESSIONAL PRACTICE



# Effectiveness of Wound, Ostomy, and Continence Nurses on Agency-Level Wound and Incontinence Outcomes in Home Care

Bonnie L. Westra ■ Donna Z. Bliss ■ Kay Savik ■ Yuefeng Hou ■ Andrew Borchert

**PURPOSE:** The purpose of this study was to describe the prevalence, incidence, and effectiveness of home health care (HHC) agencies' services with and without a WOC nurse related to wounds, incontinence, and urinary tract infection (UTI) patient outcomes.

**SUBJECTS AND SETTING:** There were 449,243 episodes of care from a national convenience sample of 785 HHC agencies representing nonmaternity patients who were aged 18 years or older and receiving skilled home health services between October 1, 2008, and December 31, 2009.

**DESIGN:** This study employed descriptive and comparative designs for data collection and analysis. We analyzed data from HHC agencies' electronic health records and conducted an Internet-based survey of HHC agencies.

**INSTRUMENTS:** Data for this study were documented by HHC clinicians using the Outcome and Assessment Information Set. An Internet survey identified if a WOC nurse provided care or consultations within an HHC agency.

**RESULTS:** The majority of HHC agencies (88.5%) had some influence of a WOC nurse. The incidence of wounds, incontinence, and UTIs was higher for agencies with no WOC nurse. Home health care agencies with WOC nurses had significantly better

improvement outcomes for pressure ulcers, lower extremity ulcers, surgical wounds, urinary incontinence, bowel incontinence, and UTIs as well as significantly better stabilization outcomes for these outcomes except lower extremity ulcers. Virtually all patients in HHC agencies with and without a WOC nurse had stabilization of their lower extremity ulcers.

**CONCLUSIONS:** Findings of this study suggest that influence of a WOC nurse is effective in achieving several important positive outcomes of HHC agencies' services for wounds, incontinence, and UTIs.

## Introduction

Specialty practice nurses with additional education and experience are better prepared to provide high-quality

care beyond their basic preparation as registered nurses.<sup>1</sup> Research demonstrates the effectiveness of advanced practice nurses who have formal advanced degrees<sup>2</sup>; however, there is limited evidence about the effectiveness of nurses with specialty certifications that require additional education but not an advanced degree.<sup>1</sup> Wound, ostomy and continence (WOC) nurses are defined as nurses certified by the Wound, Ostomy and Continence Nursing Certification Board in 1 or more of the specialty areas of practice (wound, ostomy, or continence care) and/or a graduate of a WOCN-accredited nursing education program. Evidence for effectiveness of WOC nurses (vs noncertified nurses) in improving wound and incontinence outcomes is limited,<sup>3</sup> particularly, in home health care (HHC), which is emerging as an important setting in which WOC nurses practice.

With the exponential growth in health care costs, there is an increasing shift toward providing health care through HHC and other non-acute care settings. It is anticipated that expenditures in HHC will increase from \$57.6 billion to \$119 billion by 2017, representing a major opportunity for WOC nursing practice.<sup>4</sup> Based on the increased use of technologies such as telehealth, HHC will likely expand

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even more as an increasing number of payers begin covering telehealth services.<sup>5,6</sup> Wound care and incontinence problems account for major reasons why patients receive home care services,<sup>7</sup> suggesting a need for WOC nurses. It is critical for WOC nurses to provide information about their contributions to HHC services in prevention and treatment of costly conditions such as wounds, incontinence, and urinary tract infections (UTIs).

## ▪ Purpose and Aims

The purpose of this study was to describe the prevalence, incidence, and effectiveness of services of HHC agencies with and without a WOC nurse related to wound and incontinence patient outcomes. Prevalence is defined as the occurrence of a condition at admission and incidence is onset of a condition after admission when no previous problem existed. The investigators addressed 6 conditions: pressure ulcers, stasis ulcers, surgical wounds, urinary incontinence, bowel incontinence, and UTIs. The research questions were as follows: (1) What are the prevalence and incidence of pressure ulcers, stasis ulcers, surgical wounds, urinary incontinence, bowel incontinence, and UTIs in HHC with and without a WOC nurse? (2) Is having a WOC nurse a significant predictor of improvement and stabilization (not worsening) outcomes for pressure ulcers, stasis ulcers, surgical wounds, urinary incontinence, bowel incontinence, and UTIs of HHC agencies? We assumed that WOC nurses directly influence patients for whom they provide care or consultation as well as indirectly influence all patients in an agency through their role in staff education, development of procedures for wound and incontinence care, selection of supplies, and other roles within the agency.

## ▪ Methods

This study employed a descriptive and comparative design for data collection and analysis. We analyzed data from HHC agencies' electronic health records and conducted an Internet-based survey of these agencies. After obtaining approval from the institutional review board at the University of Minnesota, consent was obtained from HHC agencies through either a data use agreement or an Internet-based survey. The data use agreement and survey also provided information about whether the HHC agency had a WOC nurse and whether they provided WOC nurse telehealth consultations. The HHC agency's electronic health record was the source for the Outcome and Assessment Information Set (OASIS—Version B-1) data. OASIS is the Centers for Medicare & Medicaid Services (CMS) mandatory assessment required for all Medicare certified HHC agencies and includes demographic and patient history information, living arrangements and social support, health status, functional status, medication and equipment management, the need for therapy, and

discharge information. OASIS is considered the “gold standard” for assessment and outcome measurement in home care based on 15 years of development.<sup>8</sup> It is highly audited for accuracy because the data are used for quality improvement, public reporting, and calculation of Medicare's prospective payment rate.

## ▪ Agency Recruitment and Data Collection Procedures

Home health care agencies were recruited through state home care associations, HHC software vendors, home care conferences, an article in a home health journal, and other professional organizations. Data from HHC agencies represent a national convenience sample of Medicare certified agencies and their patients who were admitted and discharged between October 1, 2008, and December 31, 2009. This time frame was selected as agencies were experienced with OASIS B data collection. OASIS C was initiated January 1, 2010, and there was concern that the lack of familiarity with changes in the new version could result in inconsistent documentation.

As part of the recruitment process, HHC agencies were provided with a link to an Internet survey and the phone number of the investigators to assist them to identify whether they had a WOC nurse and obtain data for the study. Prior to submitting OASIS data for the study, a limited data set was created by removing all patient identifiers except a patient identification number and dates for admission, discharge, and birth date. Small- to mid-size agencies downloaded a modified version of a commercial quality improvement software program (Home Health Gold, Waterville, Maine) to create the limited data set. In larger agencies, the information technology staff removed patient identifiable information. Data were securely transferred to the investigators using remote access software (Citrix Go To Assist, Santa Clara, California) or agencies uploaded their data via the secure Web site at the investigators' university.

## ▪ Data Preparation

Data were processed to create episodes of care, define the clinical conditions of interest, transform some of the OASIS data items into relevant predictors of the outcome of each clinical condition, and categorize agencies by the type of WOC nurse involvement in the agency. An episode of care was defined as a continuous time period during which a patient received intermittent home care visits. Episodes of care in OASIS were created by matching a start of care and discharge assessment record. Consistent with Medicare requirements for OASIS data collection, patients were 18 years of age or older and admitted for nonmaternal health conditions.

The clinical conditions whose outcomes were analyzed are shown in Table 1. These clinical conditions were

**TABLE 1.**

**Definitions of Clinical Conditions**

Clinical Condition	Description and OASIS Element	Scores
Pressure ulcers	Total number of pressure ulcers (M0450 a-e)	0-17
Stasis ulcers	Total number stasis ulcers (M0470/ M0474)	0-5
Surgical wounds	Total number of surgical wound (M0484/ M0486)	0-5
Urinary incontinence	Frequency of urinary incontinence (M0520)	0 = no urinary incontinence 1 = incontinent 2 = requires a urinary catheter
Urinary tract infection (UTI)	Treated for UTI in past 14 d (M0510)	0 = no 1 = on prophylactic treatment 2 = yes
Bowel incontinence	Frequency of bowel incontinence (M0540)	0 = very rarely/ never 1 = less than 1 time per/week 2 = 1-3 times per week 3 = 4-6 times per week 4 = daily 5 = more often than daily

Abbreviation: OASIS, Outcome and Assessment Information Set.

selected based on OASIS B outcomes used by the CMS, review of the literature, and consensus among the researchers and clinical consultants. The 2 types of outcomes were created for each clinical condition: “improvement” and “stabilization” (operationally defined as not worse at discharge). The definitions for improvement and stabilization are based on the CMS’ definition of outcomes. These outcomes were calculated by comparing the patient’s status at 2 points in time: start of care and discharge. An outcome of improvement includes only patients who could improve; therefore, they did not have a problem at admission. An outcome of stabilization includes only patients who would not get worse; therefore, stabilization outcomes did not include patients who had the worst possible score upon admission. Each outcome, improvement or stabilization, was scored as a “Yes”

or “No.” Patients can be included in both types of outcomes as shown in Figure 1, which is an example for the frequency of urinary incontinence. As shown in Figure 1, urinary incontinence was scored as 0 (no incontinence), 1 (incontinent), and 2 (required a urinary catheter). Patients who scored a 0 at admission (operationally defined as individuals who did not have urinary incontinence or an indwelling urinary catheter) were excluded for calculating the outcome of improvement in urinary incontinence. Patients who scored a 2 at admission were excluded from the outcome for stabilization of urinary incontinence because they required a urinary catheter at admission. Patients who were assessed as a 1 were included in both outcome calculations.

New variables and scales of potential predictors of each outcome were necessary to create from OASIS items,

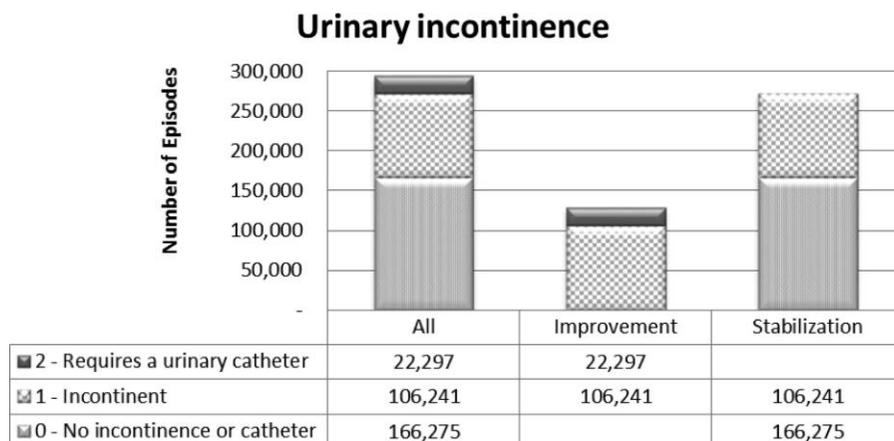


FIGURE 1. Comparison for the number of episodes for all patients versus patients included for improvement or stabilization outcomes for urinary incontinence.

because several items on the OASIS assessment form to define a predictor or the specific predictor needed were not available without a transformation. Including scaled variables using multiple OASIS elements also resulted in parsimonious models. The newly created predictor variables were length of stay, payer categories, age, race/ethnic categories, activities of daily living, instrumental activities of daily living, prognosis scale, Charlson Index of Comorbidity, caregiver risk factors, urinary incontinence history, behavioral problems, severe nutrition, respiratory status, and medication management.

Categorization of agencies with WOC nurse involvement varied based on the involvement of a WOC nurse within that agency. Therefore, 4 mutually exclusive agency groups were developed according to the potential influence of a WOC nurse on outcomes. Agencies were categorized in the following order: (1) In-Person WOC nurse was defined as an agency that had a WOC nurse who provided in-person visits or consultations to identifiable patients ( $n = 90$ ); (2) Telehealth WOC nurse was defined as an agency that provided telehealth visits for specific patients, but the patient identifier was not available, only the agency was identifiable ( $n = 390$ ); (3) Organization WOC nurse was defined as an organization that had a WOC nurse, but the role did not include in-person visits or consultations ( $n = 286$ ); and (4) no WOC nurse was defined as an agency that had no WOC nurse ( $n = 19$ ).

## ▪ Data Analysis

SAS (SAS Institute, version 9.2; Cary, North Carolina) was used for descriptive statistics, calculation of prevalence and incidence, and creation of models for outcomes using Mixed Effect Logistic Regression models to calculate agency-level and individual-level improvement and not worse (stabilization) outcomes for each type of wound and incontinence outcome. The mixed-effect logistic regression analysis allows the use of binary outcomes and controls for the random effect of agencies. It would be expected that subjects within agencies would be more similar than subjects from different agencies; hence, a random effect for the agency variable was used.

A list of candidate covariates thought to predict each clinical condition was identified through review of the literature and expert consensus. It was originally expected that these covariates would be entered into models including the indicator for having a WOC nurse to get an estimate of the effect of the WOC nurse, while controlling for other important factors. However, in reviewing these models, it was found that many of the covariates were confounded with each other and with having a WOC nurse. Putting these together in a model led to convergence problems, variables “blowing up” (having extremely large confidence intervals) and having effects in the opposite direction than considered realistically possible.

It was suspected that some of the covariates for the outcomes were confounded with receiving a WOC nurse at admission (eg, several indicators that sicker patients were more likely to receive a WOC nurse). To examine this idea, propensity scores were created to summarize the association of these same covariates with having a WOC nurse at both the agency and individual levels. A propensity score is the probability of a person being assigned to a particular condition (having a WOC nurse) given a set of known covariates. Propensity scores are used to reduce selection bias by equating groups based on these covariates. The type of propensity score chosen used an inverse probability of treatment weighting.<sup>9</sup> Based on Monte Carlo simulations, this resulted in unbiased risk differences with the smallest standard errors and correct type I error rates. To create the propensity score, the covariate variables were regressed on having a WOC nurse, which resulted in the probability estimates of having a WOC nurse (propensity score) for each subject. All the covariates were associated with having a WOC nurse in the direction expected and can be found in Table 2. A logistic regression analysis was then able to be conducted when the indicator variable for WOC nurse, weighted by the propensity score, was included in the final model determining the effect of the WOC nurse on agency outcomes. One of the models at the agency level, stabilization of stasis ulcers, could not be analyzed as stabilization for the WOC nurse group and without WOC nurse group reached more than 99% stabilization, leaving no variance to model.

## ▪ Results

Eight hundred eight participating agencies provided 1,560,508 OASIS records representing 888,243 patients. OASIS records were excluded for the following reasons: age less than 18 years, primary diagnosis related to pregnancy or pregnancy complications ( $n = 822$ ), assessments occurred outside the study dates ( $n = 125,886$ ), incomplete episode records ( $n = 464,485$ ), incorrect type of assessment (meaning not a start of care or discharge assessment) ( $n = 51,779$ ), duplicate records ( $n = 2748$ ), or masked or missing data ( $n = 16,302$ ). After all OASIS assessments were matched and cleaned, the resulting number of agencies overall according to the type of agency WOC nurse involvement is shown in Table 3. The majority of agencies (85.5%) had some form of influence by a WOC nurse within the agency. Agencies with an “Organization WOC nurse” were not significantly associated with outcomes and, therefore, were dropped from the analysis. Analysis of prevalence, incidence, and agency-level outcomes compared agencies with a WOC nurse (either an In-Person or Telehealth WOC nurse) with agencies that had no WOC nurse. The number of WOC nurses for the In Person organizations ranged from 1 to 8; most agencies, however, had a single WOC nurse. The most frequent certification was in all specialties (wound,

**TABLE 2.**

**Predictor Variables for Propensity Analysis of Agency-Level Outcomes**

Factors Potentially Affecting Having a WOC Nurse	PU	SU	SW	UTI	UI	BI
Age		X		X	X	X
Female gender				X		X
Length of stay	X	X	X	X	X	X
Race/ ethnicity–Black	X	X	X	X	X	X
Race/ ethnicity–Other	X	X	X			
Geographical region	X	X	X	X	X	X
Admitted from another facility	X	X	X			
Prognosis	X	X	X	X	X	X
Medical /treatment regimen change past 14 d	X	X	X	X	X	X
Nutritional severity		X	X		X	X
Obesity	X	X	X	X	X	X
Smoking	X	X	X			
Lives alone	X	X	X	X	X	
Total number pressure ulcers at admission	X					
Total number of stasis ulcers at admission		X				
Surgical wound present	X					
Total number surgical wounds			X			
UTI in the past 14 d	X			X	X	
History of urinary incontinence	X			X	X	X
Urinary incontinence or urinary catheter presence	X		X	X	X	X
Bowel incontinence frequency	X			X	X	X
IADL				X	X	X
Activities of daily living	X	X		X	X	X

Abbreviations: BI, bowel incontinence; IADL, instrumental activities of daily living; PU, pressure ulcer; SU, stasis ulcers; SW, surgical wounds; UI, urinary incontinence; UTI, urinary tract infection.

ostomy and continence, n = 60%), followed by certification in wounds and ostomies (13.4%) and then only wounds (12%). Additional certifications were for ostomy care (5.6%), continence care (4.9%), and graduated but not yet certified (4.2%). For agencies with Telehealth, the specific type of certification was not reported.

Patients were predominately elderly (82% were 65 years and older), with slightly more women (65%), and consisted of nearly 80% whites with 13% African Americans. About two-thirds were admitted from a hospital or facility. Most patients (76.7%) were discharged within 60 days or less. Medicare was the major payer for

**TABLE 3.**

**Number of Episodes of Care for All Patients by Type of Agency WOC Nurse Involvement**

	All Agencies	In-Person WOC Nurse	Telehealth WOC Nurse	Organization WOC Nurse	No WOC Nurse
Number of agencies	785	90	390	286	19
Total number of episodes	449,243	127,368	154,184	154,430	13,261
Total percentage of episodes	100	28.4	34.3	34.4	3.0
Minimum number	1	66	1	1	30
Maximum number	36,486	36,486	2,316	2,932	3,650
Median number	359	1,059	877	36	284

home care services (92%). Patients in this study represent all regions of the country: Midwest (11%), Northeast (19%), South (59%), and West (11%). About one-third (29%) lived alone and nearly all patients required assistance with activities of daily living (94.7%) or instrumental activities of daily living (99.3%). A number of patients (42%) had 1 or more reportable conditions requiring a medical or treatment change in the previous 14 days before admission to the home care agency (urinary incontinence, indwelling/suprapubic catheter, intractable pain, impaired decision making, disruptive or socially inappropriate behavior, or memory loss requiring supervision). Their prognosis varied on a scale from 1 to 4 that combined overall and rehabilitation prognosis as well as life expectancy. The majority of patients (75%) had a score of 0 or 1, indicating an expectation for partial or full recovery. Only 3% of patients had severe nutritional status, indicated by the need for parenteral or enteral therapy. Obesity was experienced by 15% of the sample. The number of patients who were heavy smokers included 6.2% of the sample. The primary diagnosis represents the reason for home care. The most frequent reasons were symptoms, signs, and ill-defined conditions combined with (28.9%), frequently used to indicate the need for physical therapy and rehabilitation; diseases of the circulatory system (11.2%), for example, heart failure, cerebrovascular disease, and hypertension; and injury and poisoning (10.8%), such as fractures, wounds, or problems with medications.

### ■ Prevalence and Incidence of Wounds, Incontinence, and UTIs

The prevalence for each type of wound, incontinence, and UTI is presented in Table 4 for all episodes of care and then for those episodes in agencies with and without a WOC nurse. The clinical condition with the highest prevalence was urinary incontinence, comprising nearly half of all episodes of care (43.6%). The second highest prevalence was surgical wounds (27.9%). The prevalence was much lower for bowel incontinence and UTIs, and pressure and

lower extremity ulcers had the lowest prevalence. The prevalence of most clinical conditions was similar between agencies with or without a WOC nurse except for surgical wounds and urinary incontinence, which were higher in agencies without a WOC nurse.

The incidence of wounds, incontinence, and UTIs is shown in Table 4. The incidence of urinary incontinence (3.9%) was highest followed by bowel incontinence (3%). Incidence for all other conditions was less than 2%. The incidence of all clinical conditions except stasis ulcers was higher in no-WOC-nurse agencies, and urinary incontinence was more than double in no-WOC-nurse agencies.

### ■ Effect of WOC Nurse

The number of episodes of care for each agency-level outcome varied considerably. A comparison of the number of episodes for all agencies and those with or without a WOC nurse by each clinical condition is shown in Table 5. The number of episodes for improvement versus stabilization outcomes is much smaller. In addition, the number of episodes of care for agencies with no WOC nurse is considerably smaller than that in agencies with a WOC nurse.

Table 6 summarizes analyses of improvement and stabilization outcomes and the effect of the WOC nurse. We calculated odds ratios (OR) when comparing the effect of a group on a specific outcome. The OR is defined as the odds of an event for one group divided by the odds of an event for the other group. For example, if 40 subjects' urinary incontinence improved in a group of 300, the odds of improving is  $40/300 = 0.13$ . Suppose that this is the group without a WOC nurse. The group with a WOC nurse had 60 people whose urinary incontinence improved in a group of 300, their odds being  $60/300 = 0.20$ . To compare the groups, we compare the ratio of the odds from the 2 groups,  $0.20/0.13 = 1.5$ . The subjects with a WOC nurse are 50% more likely to improve than the subjects without a WOC nurse.

For improvement outcomes as shown in Table 6, if an HHC agency had a WOC nurse, patients were nearly twice

**TABLE 4.**

**Prevalence and Incidence for All Patients and Patients With or Without a WOC Nurse<sup>a</sup>**

Clinical Condition	Prevalence, %			Incidence, %		
	Total Patients	No WOCNurse	WOC Nurse	Total Patients	No WOC Nurse	WOC Nurse
Pressure ulcers	5.0	5.7	5.0	0.6	0.8	0.6
Stasis ulcers	1.5	1.8	1.5	0.3	0.2	0.3
Surgical wounds	27.9	36.3	27.5	1.9	2.8	1.9
Urinary incontinence	43.6	49.4	43.3	3.9	9.6	4.0
Bowel incontinence	16.5	16.4	16.5	3.0	3.1	3.0
Urinarytractinfections	8.2	10.4	8.2	1.2	1.7	1.2

<sup>a</sup>Total (n = 294,813), no WOC nurse (n = 13,261), and WOC nurse (n = 281,552).

**TABLE 5.**  
**Number of Eligible Episodes for Risk Adjusted Analysis of Agency-Level Outcomes**

Clinical Condition	Number Eligible for Improvement Outcomes			Number Eligible for Stabilization Outcomes		
	All	No WOC Nurse	WOC Nurse	All	No WOC Nurse	WOC Nurse
Pressure ulcers	10,582	541	10,041	23,1070	10,121	220,949
Stasis ulcers	3,725	199	3,526	294,770	13,259	293,726
Surgical wound	62,271	3,481	58,790	232,227	10,153	222,074
Urinary incontinence	119,974	6,175	113,799	272,516	12,335	260,181
Bowel incontinence	45,014	1,999	4,3015	277,480	12,561	264,919
Urinary tract infections	23,158	1,320	21,838	262,944	11599	251,345

as likely (OR = 1.9) to have improvement in pressure ulcers. Patients in WOC nurse agencies were 40% more likely to have improvement in urinary incontinence, and 20% to 40% more likely to have improvement in lower extremity ulcers and surgical wounds. Patients in HHC agencies with a WOC nurse were 14% more likely to have improvement in bowel incontinence.

Home health care agencies with a WOC nurse also had significantly better results for all stabilization outcomes with the exception of stasis ulcers. Home health care agencies with a WOC nurse were more than 2.3 times likely to have stabilization of urinary incontinence compared to HHC agencies with no WOC nurse. If an HHC agency had a WOC nurse, patients were 50% more likely to have stabilization of surgical wounds and nearly 30% more likely to have stabilization of pressure ulcers. Home health care agencies with a WOC nurse were 20% more likely to have stabilization of UTIs and 16% more likely to have stabilization of bowel incontinence. Overall, HHC agencies with a WOC nurse who provided in-person visits or consults or telehealth consults were more likely to have better outcomes compared to agencies with no WOC nurse. Organizations with a WOC nurse that functioned more as

an administrative staff were dropped from the analysis, as they did not seem to have an effect on agency outcomes in this analysis.

## Discussion

This is the first study to document the prevalence, incidence, and effect of WOC nurses on clinical outcomes for HHC agencies in a large national study. Compared with 2008 national case-mix data, all HHC agencies in this study had a lower prevalence for pressure ulcers (5% vs 7%), lower extremity ulcers (1.5% vs 1.6%), surgical wounds (27.9% vs 29.5%), and UTIs (8.2% vs 9.3%). The prevalence was higher for urinary incontinence (43.6% vs 40.9%). National data are not available to compare the prevalence of bowel incontinence, but compared with a previous study of 15 HHC agency data in 2004 to 2006, bowel incontinence in this study is considerably higher with 16.5% compared to 9%.<sup>10</sup> Differences may be attributable to different data sets or new trends in patient problems, assuming the latter is correct, increases in rates of both urinary and bowel incontinence in HHC agencies offer WOC nurses an opportunity for practice expansion and the opportunity to make a positive difference in an agency's outcomes. The increasing incidence of wounds, incontinence, and UTI raises awareness concerning the need for further research to identify patients at risk for these conditions and the contribution of WOC nurses in preventing such problems from occurring.

Identifying the incidence of wounds and incontinence in a national HHC population is unique to this study with the exception of bladder (UTI) infections and pressure ulcers, which the CMS labels as potentially avoidable events and began posting in 2010.<sup>11</sup> The national incidence for bladder infections (UTIs) is 1.2% (0.7%-2.3%), which is similar to our study.<sup>11</sup> Compared to the national pressure ulcer incidence in HHC of 0.5% (0.3%-0.8%), findings in this study are slightly higher than the average with 0.6% for all patients. Home health care agencies in this study with no WOC nurse had a pressure ulcer incidence of 0.8%, which is at the upper range for any state reported by the CMS. For other conditions in this study,

**TABLE 6.**  
**Outcomes Comparing Agencies With and Without a WOC Nurse<sup>a</sup>**

Outcome Concept	Improvement		Stabilization	
	OR	95% CI	OR	95% CI
Pressure ulcers	1.9	1.8-2.0	1.29	1.21-1.37
Urinary incontinence	1.4	1.38-1.43	2.3	2.26-2.4
Urinary tract infections	1.4	1.38-1.43	1.2	1.16-1.27
Surgical wounds	1.39	1.36-1.42	1.5	1.46-1.57
Stasis ulcers	1.2	1.1-1.3	Unable to model <sup>b</sup>	
Bowel incontinence	1.14	1.11-1.2	1.16	1.23-1.9

Abbreviations: CI, confidence interval; OR, odds ratio.

<sup>a</sup>ORs weighted by the propensity score for having a WOC nurse.

<sup>b</sup>Unable to model due to more than 99% stabilization across all subjects.

there is no nationally reported incidence. With the exception of stasis ulcers, there is a higher incidence of all clinical conditions in agencies with no WOC nurse, with the incidence of urinary incontinence occurring nearly twice as high as in HHC agencies without a WOC nurse. The role of the WOC nurse includes assessment, care planning, application of evidence-based guidelines, and outcome evaluation.<sup>12,13</sup> Future research should address more specifically the specific aspects of the WOC nurse that influences better outcomes found in our study.

Home health care agencies with a WOC nurse had significantly better outcomes for both improvement and stabilization of wounds, urinary and bowel incontinence, and UTIs when compared to HHC agencies with no WOC nurse. The largest effect of a WOC nurse on improvement was seen for pressure ulcers and for stabilization it was for urinary incontinence.

The CMS posts outcomes by state and nationally for urinary incontinence, UTIs, bowel incontinence, and healing of surgical wounds.<sup>11,14</sup> The findings of this study encourage both the WOC nurse and HHC agency to document the benefit WOC nurses provide to HHC services/outcomes. A few other studies have also shown the value of WOC nurses,<sup>3,15,16</sup> but this study provides a major contribution supporting the value of WOC nurses due to its scope, sample size, and rigor as well as the strength of its findings.

### Limitations

There are several limitations of this study. First, it is a convenience sample of HHC agencies, which limits generalization of the findings. However, the large sample of 785 HHC agencies with 449,243 episodes of care representing all regions of the United States, including large and small agencies, provides substantial evidence that WOC nurses have a positive and significant influence on wound and incontinence outcomes. This study is a secondary analysis of OASIS data, which was collected for assessment of patients and not for purposes of research. While the data are heavily audited, there may be differences in how items are answered, which could influence results of this study. WOC nurses provide care to ostomy patients; outcomes related to ostomy patients were not included in this study due to the lack of OASIS data addressing ostomies.

### Conclusions

This study provides evidence that WOC nurses are a significant factor in HHC agencies achieving better outcomes for their patients in terms of improvement and stabilization of wounds, incontinence, and UTIs. Findings suggest that there is value of certification for specialty nurses who are not required to have advanced degrees but have specialized education and experience beyond basic nursing education.<sup>12,16,17</sup>

## KEY POINTS

- The majority of HHC agencies studied (88.5%) had ~~some~~ influence of a WOC nurse.
- Clinical conditions of urinary incontinence and surgical wounds have a high prevalence among episodes of care in HHC agencies; stasis ulcers have a low prevalence.
- Clinical condition of urinary incontinence has a high incidence in HHC agencies. The incidence in HHC agencies without a WOC nurse is twice that of those with a WOC nurse.
- HHC agencies with WOC nurses had significantly better stabilization outcomes for pressure ulcers, surgical wounds, urinary incontinence, bowel incontinence, and UTIs. They had better improvement outcomes for these entire outcomes as well as for stasis ulcers.

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