Published in final edited form as:

J Gerontol Nurs. 2008 May ; 34(5): 12–18.

Validating MDS Data about Risk Factors for Perineal Dermatitis by Comparing With Nursing Home Records

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Abstract

Perineal dermatitis is one of the main complications of incontinence and increases the cost of health care. The Minimum Data Set (MDS) contains data about factors associated with perineal dermatitis identified in a published conceptual model of perineal dermatitis. The purpose of this study was to determine the validity of MDS data related to perineal dermatitis risk factors by comparing them with data in nursing home chart records. Findings indicate that MDS items defining factors associated with perineal dermatitis were valid and supported use of the MDS in further investigation of a significant, costly, and understudied health problem of nursing home residents.

Perineal dermatitis (PD) is an inflammation of the skin in the genital, buttock, and thigh areas that can result in decreased well-being and increased health care costs. In mild cases, PD manifests as redness and discomfort. In more severe cases, there is loss of superficial skin layers, a rash or oozing vesicles, and pain. Secondary fungal infection may also occur (Brown & Sears, 1993). It is estimated that 35% of older adults who are incontinent have a rash or redness requiring treatment; the estimated annual cost of such skin irritations in nursing home residents with urinary incontinence is \$6.6 billion (Wilson, Brown, Shin, Luc, & Subak, 2001). Yet, few studies about PD or its associated factors in older adults in any setting have been conducted.

Bliss, Savik, Harms, Fan, and Wyman (2006) investigated the prevalence and correlates of PD in nursing home residents, guided by a conceptual model of PD (Brown & Sears, 1993). Minimum Data Set (MDS) items were used to represent the factors in the model. Because numerous items from the MDS could be used to define each PD factor, composite variables of MDS items needed to be developed (Savik, Fan, Bliss, & Harms, 2005). This study reports the preliminary analysis of the validity of the MDS items used to operationally define those PD factors. Determining the validity of sources of data or measures of variables

is important to show the degree to which they measure what they intend to measure. Criterion validity is determined by comparing the relationship between a data source and an external criterion (Polit & Beck, 2004). When the data obtained within the instruments agree or correlate highly with those of the external criterion, the instrument is validated.

The purpose of this study was to ascertain the validity of items on the MDS that are postulated to be associated with PD. This was done by determining the agreement between data on the MDS and in the medical and nursing records of nursing home residents. Determining the validity of the MDS items was an important step before the PD factors they defined could be used in any subsequent analysis (Bliss et al., 2006).

LITERATURE REVIEW

The MDS is a standardized instrument used for the comprehensive assessment and care planning of nursing home residents; it provides a rich source of information that is useful for researching the health problems of nursing home residents. Federal law mandates that all residents in nursing facilities certified by Medicare or Medicaid be assessed using the MDS at admission, with any significant change in health condition, and at set intervals (Centers for Medicare & Medicaid Services, 2006).

Several studies have reported the validity of the MDS overall (Casten, Lawton, Parmelee, & Kleban, 1998; Lawton, Casten, Parmelee, Van Haitsma, & Kleban, 1998; Morris, Jones, Fries, & Hirdes, 2004). Previous studies have also validated selected items on the MDS by comparing them with other validated scales and nursing home chart records. For example, the validity of MDS items related to mood (Meeks, 2004), pain (Cohen-Mansfield, 2004), and cognition (Cohen-Mansfield, Taylor, McConnell, & Horton, 1998; Gruber-Baldini, Zimmerman, Mortimore, & Magaziner, 2000) showed fair to good correlations that were statistically significant; MDS items were also found to be predictive of protein calorie malnutrition (Crogan & Corbett, 2002).

When compared with nursing home chart data, MDS data related to falls collected over a longer period (180 days) showed good agreement ($\kappa = 0.50, p < 0.001$); shorter term (collected in 30 days) MDS data related to falls had fair agreement with chart data ($\kappa = 0.29, p < 0.001$) (Hill-Westmoreland & Gruber-Baldini, 2005). Chart documentation of incontinence care processes was consistent with MDS reporting; for example, MDS data about residents' requiring toileting assistance agreed with chart documentation about residents' reports of needing and having received toileting assistance. However, some differences were found when MDS items were compared with residents' recall of care instead of the nursing home chart data (Schnelle et al., 2003). The validity of some MDS items can differ depending on the sample. Therefore, validating MDS data is important when using it for research. Using nursing home residents' charts as a criterion against which to compare MDS data is a standard approach for validating the MDS.

METHOD

Records of residents in two nonprofit nursing homes in the Twin Cities area of Minnesota were analyzed. Each nursing home housed residents on three floors; a total of 106 residents lived in one home and 184 lived in the other. Residents were eligible for the study if they had a full MDS assessment within the previous 12 months, were age 65 or older, and experienced urinary or fecal incontinence. A nursing home staff member used MDS data to screen all residents for meeting the inclusion criteria, and other nursing home staff confirmed eligibility.

Sample

Given the intensity of the chart review process, time involved in contacting some of the residents' legal representatives for informed consent, and amount of funds available for the study, a sample size of approximately 40 residents (approximately 20 from each nursing home) was planned. Eligible residents were stratified by kind of incontinence, location in the nursing home, and whether they had perineal skin damage. Because it is not possible to determine using the MDS whether skin damage is in the perineal area, this information was obtained from residents' chart records.

Using a list of computer-generated random numbers, residents were selected for recruitment from each stratum on the basis of their proportion in the nursing home. Random recruitment from strata was done to avoid inclusion of residents with only one kind of incontinence or skin status or from one floor. The number to be recruited from each stratum was determined by the proportion of residents in that stratum to the entire nursing home population.

Residents who met the inclusion criteria were asked by nursing home staff whether they were interested in discussing the study with the investigators. If residents were unable to give consent, their legal representative was contacted in person or by letter by the nursing home staff. Research assistants (RAs) (graduate nursing students) assigned to each nursing home obtained informed consent from residents or their legal representatives. This study was approved by the participating university's committee for the protection of human subjects in research.

Variables

The conceptual model of PD (Brown & Sears, 1993) guided the selection of variables to be compared between the MDS and medical and nursing home records. In the model, factors associated with PD are grouped into three main categories:

- Tissue tolerance.
- Perineal environment.
- Toileting ability.

Indicators of tissue tolerance include factors such as age, health problems, problems with nutrition, perfusion, oxygenation, and fever. Factors in the perineal environment include frequency and kind of incontinence, mechanical chafing, skin irritants, problems of skin hydration, and fecal enzymes. Factors of toileting ability include problems of mobility, neurosensory deficits, and cognitive awareness.

The model was originally developed for a study of PD in hospital patients, but Bliss et al. (2006) saw a potential use for guiding analysis of PD in nursing home residents. They added the use of restraints as an indicator of toileting ability because of its high relevance to nursing home residents and operationalized its components using the MDS after the analysis described in this study was completed. Items found both on the model and in the chart were identified.

Data Collection

A data collection form based on Brown and Sears' (1993) model was developed by the investigators to collect the needed information from the medical or nursing home records. The RA recorded data from more than 20 medical and nursing home forms reported during the time that coincided with completion of corresponding variables on the full MDS; examples included the nursing care plan, medical orders, treatment plans, medication administration records, nutrition assessment forms, special skin/wound assessment forms, bedside forms such as intake and output and dietary records, and progress notes. The RA entered data collected from the medical and nursing home records and the MDS into SPSS, version 13, which was also used for analysis.

To ensure reliability of the RAs' data collection, the principal investigator (D.Z.B.) randomly selected one resident from each nursing home and independently recorded the same kind of data from the resident's medical and nursing records as did the data collectors.

Data Analysis

A percentage agreement was calculated between data from individual items on the MDS and nursing home records. A kappa statistic was used to determine overall agreement beyond chance between data obtained from all of the items on the MDS and all of the items collected from the nursing home records of the study participants and between the data collected by the principal investigator and each RA. Interpretations of kappa statistics show that values greater than 0.7 are considered very good and those 0.9 and greater are considered excellent (Feinstein & Cicchetti, 1990).

RESULTS

The sample included 43 residents (23 from one nursing home and 20 from the other), was 93% Caucasian and 88% female, and consisted of residents from all three floors of the nursing homes. Table 1 provides the main characteristics of the sample according to the three factors in the conceptual model of PD (Brown & Sears, 1993). In the tissue tolerance category, the sample included age (mean age = 86, $SD = 8$ years), the presence of comorbid health problems (e.g., Alzheimer's disease, stroke), and nutrition problems. In the perineal environment category, both urinary and fecal incontinence was most common and present in approximately two thirds of the residents. A high percentage of residents wore absorbent products. In the toileting ability category, few residents (2%) were bedfast, and nearly half of the sample was totally dependent in toileting and hygiene care. Restraints were used with 9% of the residents.

Table 2 shows the percentage of agreement between the individual items on the MDS and the medical and nursing home records of both nursing homes' residents. Variables are arranged according to the three main categories in the conceptual model of factors associated with PD (Brown & Sears, 1993). Two items had 100% agreement, and all items except two (hypertension [54%] and eating <25% of food at most meals [61%]) showed an agreement of at least 70%. The highest percentage of agreement between the MDS and the charts (95%) was found for the items of age, fever, weight gain or loss, parenteral feedings, oxygenation (oxygen therapy), fecal incontinence, and paraplegia or quadriplegia.

The kappa statistic (standard error) for overall agreement beyond chance of all of the items compared was 0.72 (0.03) ($p < 0.001$, 95% confidence intervals = 0.66 to 0.78). These results indicate very good agreement. The kappa statistic for the agreement between the principal investigator and the RA was 1 ($p = 0.000007$) in one nursing home and 0.72 ($p = 0.00006$) in the other nursing home. These results show excellent agreement.

DISCUSSION

Previous studies have demonstrated the importance of validating MDS items for use in research by comparing the MDS items with nursing home records. The findings of this study show a very good agreement between documentation in the nursing home charts and the MDS items selected and, therefore, support collecting data related to PD using the MDS. These findings are in agreement with comparisons of nursing home chart and MDS data reported by others (Hill-Westmoreland & Gruber-Baldini, 2005; Schnelle et al., 2003).

Resident survey data or observer-collected data may yield different results. The conceptual model of PD was useful in guiding data collection. Not unlike other studies that focused on a small number of nursing homes, the generalizability of this study was limited by the small sample.

NURSING IMPLICATIONS

Clinical implications of the findings indicate that accurate documentation in residents' charts and on the MDS are important for planning resident care and supporting nursing research. Nurse documentation on the MDS may be used for research studies and thus to improve resident outcomes and care processes. The numerous and interdisciplinary forms on which resident data are documented support the need for an organized approach and quality check when completing the MDS.

SUMMARY

PD is one of the main complications of incontinence and increases the cost of health care. The MDS contains data about factors associated with PD identified in a published conceptual model of PD. The purpose of this study was to determine the validity of MDS data related to PD risk factors by comparing them with data in nursing home chart records. Findings indicated that MDS items defining factors associated with PD were valid and supported use of the MDS in further investigation of a significant, costly, and understudied health problem of nursing home residents.

Acknowledgments

This study was funded in part by a grant from the Gerontological Nursing Interventions Research Center NIH #P30 NR03970 [PI: Toni Tripp-Reimer, The University of Iowa College of Nursing] and an unrestricted faculty development grant by 3M Medical Division, both to Dr. Donna Z. Bliss.

The authors thank the staff and administration of the nursing homes for their cooperation with this study. They acknowledge data collection by Lisa Rice and Jill Scholz, who were graduate research assistants at the University of Minnesota School of Nursing.

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TABLE 1

CHARACTERISTICS OF NURSING HOME RESIDENTS ACCORDING TO MDS FACTORS
ASSOCIATED WITH PERINEAL DERMATITIS ($N = 43$)

Characteristic	Number of Residents (%)	MDS Code
I. Tissue tolerance factors		
Age (mean age = 86, $SD = 8$ years)		AA3
Health status		
Alzheimer's disease	19 (44)	I1q
Arthritis	10 (23)	I1l
Stroke	17 (40)	I1t
Diabetes	3 (7)	I1a
Hypertension	22 (51)	I1h
Macular degeneration	4 (9)	I1mm
Osteoporosis	15 (35)	I1o
Parkinson's disease	3 (7)	I1y
Cancer	4 (9)	I1pp
Peripheral vascular disease	2 (5)	I1j
Medication use		
Antibiotic medications	43 (100)	O4
Antipsychotic/hypnotic agents	8 (19)	O4a
Diuretic agents	13 (30)	O4e
Antidepressant agents	23 (53)	O4c
Temperature		
Fever	0 (0)	J1h
Perfusion		
Weight gain or loss >3 pounds in 7 days or 10% in past 180 days	0 (0)	J1a
Edema	6 (14)	J1g
Nutrition		
5% weight gain or loss in past 30 days	10 (23)	K3b
Eats <25% of food at most meals	19 (44)	K4c
Dietary supplement	7 (16)	K5f
Planned weight change program	8 (19)	K5h
Mechanically altered diet	12 (28)	K5c
Nutrition support		
Parenteral/enteral feedings	7 (16)	K6a, b
Oxygenation		
Oxygen therapy	1 (2)	P1ag
II. Perineal environment factors		
Incontinence		
Urinary only	12 (28)	H1b

Characteristic	Number of Residents (%)	MDS Code
Fecal only	2 (5)	H1a
Pads or briefs used	41 (95)	H3g
III. Toileting ability factors		
Bedfast	1 (2)	G6a
Sliding board use	6 (14)	G6e
Manually lifted	9 (21)	G6c
No locomotion on unit	1 (2)	G1e
Cane, walker, or crutch use	13 (30)	G5a
Inability to walk in room	23 (53)	H1
Wheelchair use	28 (65)	G5b, c, d
Total dependence with eating	9 (21)	G1h
Total dependence with bathing	23 (53)	G2
Total dependence with toileting	18 (42)	G1i
Total dependence with hygiene care	21 (49)	G1j
Restraints used	4 (9)	P4
Neurosensory deficits		
Paraplegia	1 (2)	I1X
Hemiplegia	5 (12)	I1v
Quadriplegia	0 (0)	I1z
Cognition		
Level of consciousness (alert)	39 (91)	B1, B4
Ability to make self understood	31 (72)	C4
Memory intact	10 (23)	B2

Note. MDS = Minimum Data Set.

TABLE 2

AGREEMENT BETWEEN DATA IN MDS AND MEDICAL/NURSING HOME RECORDS ON FACTORS RELATED TO PERINEAL DERMATITIS

Factor	% Agreement
I. Tissue Tolerance Factors	
Age	96
Health status	
Alzheimer's disease	70
Arthritis	86
Stroke	72
Diabetes	90
Hypertension	54
Macular degeneration	79
Osteoporosis	74
Parkinson's disease	91
Cancer	84
Peripheral vascular disease	93
Medication Use	
Antibiotic medications	93
Antipsychotic/hypnotic agents	74
Diuretic agents	93
Antidepressant agents	88
Temperature	
Fever	98
Perfusion	
Weight gain or loss >3 lbs in 7 days or 10% in past 180 days	98
Edema	88
Nutrition	
5% weight gain or loss in past 30 days	83
Eats <25% of food at most meals	61
Dietary supplement	72
Planned weight change program	81
Mechanically altered diet	86
Nutritional support	
Parenteral feedings	98
Enteral feedings	91
Oxygenation	
Oxygen therapy	98
II. Perineal environment factors	
Incontinence	

Factor	% Agreement
Urinary only	86
Fecal only	98
Pads or briefs used	93
III. Toileting ability factors	
Bedfast	86
Sliding board use	84
Manually lifted	72
No locomotion	93
Cane, walker, or crutch use	77
Inability to walk in room	93
Wheelchair use	74
Total dependence with eating	74
Total dependence with bathing	91
Total dependence with toileting	86
Total dependence with hygiene care	91
Restraints used	77
Neurosensory deficits	
Paraplegia	100
Hemiplegia	91
Quadriplegia	100
Cognition	
Level of consciousness (alert)	86
Ability to make self understood	77
Memory intact	76

Note. MDS = Minimum Data Set.