

TRUE PREVALENCE OF URINARY INCONTINENCE AMONG FEMALE NURSING HOME RESIDENTS

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ABSTRACT

Objectives. Urinary incontinence is a significant problem in nursing home residents in the United States. Estimates of its prevalence have often been based on data from medical records obtained at nursing home admission. To measure the sensitivity of this method of defining the prevalence of urinary incontinence among female nursing home residents, we examined data from a clinical survey.

Methods. We analyzed data from the National Nursing Home Survey, which collected information from nursing homes for each resident concerning admission diagnoses, presence of an indwelling Foley catheter or ostomy, need for assistance from equipment or personnel in using the toilet, and difficulty controlling urination.

Results. Residents' medical records revealed a very low rate of admission diagnoses of incontinence. However, clinical queries revealed a high prevalence of bladder dysfunction. More than one half of all female nursing home residents were reported to have "difficulty controlling urination," and more than one half needed assistance in using the toilet.

Conclusions. Although only 1% to 2% of nursing home residents have a diagnosis of urinary incontinence, the true prevalence of bladder dysfunction in this group is much greater. The sharp divergence of National Nursing Home Survey data from published studies on the prevalence of incontinence in nursing homes highlights the limitations of using administrative data to study the epidemiology of bladder dysfunction. UROLOGY 67: 281-287, 2006. © 2006 Elsevier Inc.

Urinary incontinence has a profound adverse effect on quality of life, particularly among the frail elderly, who may also have dementia, functional limitations, and comorbid conditions.^{1,2} Although urinary incontinence is associated with a

20% to 30% increased risk of falls and fractures and a 30% to 50% increased risk of hospitalization, perhaps its most profound consequence is the increased risk of nursing home admission.^{1,2} After adjustment for age, cohort effects, and comorbidity, Thom *et al.*² found that the relative risk of admission to a nursing home was 2.5 times greater for incontinent women and 3.7 times greater for incontinent men. Urinary incontinence has also been shown to be a marker of frailty and functional decline in the aging population.³ The cost of incontinence-related nursing home admissions has been estimated to be \$2.4 billion per year.³

In the United States, identification of incontinence at nursing home admission often relies on resident medical records.⁴ Using these data, only 1% to 2% of patients admitted to nursing homes carry a diagnosis of incontinence.⁴ However, clinical research has suggested that a much larger proportion actually has urinary incontinence at admission.^{5,6} To compare the administrative estimates with clinical estimates of the prevalence of incontinence within

This study was funded by the National Institute of Diabetes and Digestive and Kidney Diseases and in part by a Fellowship Grant from the Kidney & Urology Foundation of America, Incorporated.

M. S. Litwin is a paid consultant to Amgen and Abbott Laboratories Oncology Research and Development and is a study investigator partially funded by TAP Pharmaceuticals, Incorporated.

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Submitted: May 13, 2005, accepted (with revisions): August 4, 2005

TABLE I. Female nursing home residents with admitting or current diagnosis of urinary incontinence

	1995		1997		1999	
	Count	Rate*	Count	Rate*	Count	Rate*
Total	13,915	1,237 (949–1,524)	20,679	1,789 (1,435–2,143)	15,979	1,366 (1,050–1,681)
Age (yr)						
≤74	2,443	1,435 (605–2,265)	2,408	1,334 (610–2,058)	2,827	1,389 (588–2,190)
75–84	4,159	1,131 (662–1,601)	9,029	2,428 (1,679–3,176)	5,668	1,540 (972–2,107)
≥85	7,313	1,245 (848–1,644)	9,242	1,531 (1,085–1,978)	7,685	1,254 (823–1,685)
Race						
White	13,397	1,340 (1,022–1,558)	17,962	1,779 (1,403–2,155)	15,075	1,509 (1,148–1,869)
Other	518	421 (0.0–905)	2,717	1,969 (858–3,080)	904	554 (58–1,051)

Data from National Nursing Home Survey, 1995, 1997, 1999.

Data in parentheses are 95% confidence intervals.

* Rate per 100,000 nursing home residents in same demographic stratum.

the same study population of nursing home residents, we analyzed data from the 1999 National Nursing Home Survey.⁷

MATERIAL AND METHODS

The National Nursing Home Survey is a continuing series of population-based surveys of randomly sampled nursing homes, their residents, and their staffs conducted in 1973 to 1974, 1977, 1985, 1995, 1997, and 1999. All nursing homes included in this survey had at least three beds and were either certified by Medicare or Medicaid or had a state license to operate. Data for the survey were obtained through personal interviews with administrators and staff in 1500 facilities.⁷ The questionnaires were completed for each sampled resident by interviewing the member of the nursing staff most familiar with the care provided to that resident. No resident was interviewed directly, but those who were able did complete questionnaires.⁷

The data set is unique in that it provides information on nursing homes from two perspectives: that of the provider of services and that of the recipient. Provider data include clinical variables, as well as information about the size and ownership of the facility, Medicare/Medicaid certification, occupancy rate, number of days of care provided, and expenses. Recipient data include demographic characteristics, health status, and services received.⁸

We analyzed prevalence data from the National Nursing Home Survey for 1995 through 1999. Questions addressed the presence of an indwelling Foley catheter or ostomy, the need for assistance from equipment or personnel in using the toilet, and difficulty in controlling urination. Nursing home staff answered the questions using their observations of the residents. Staff members were also asked to refer to a resident's medical record to identify primary and other diagnoses codes at admission and at the survey.⁷

RESULTS

The rate of nursing home admission for women with a diagnosis of urinary incontinence, as obtained from medical records at the survey, remained stable from 1995 to 1999, when it was 1366 per 100,000 female residents (less than 1.4%, Table I). The incontinence rates were similar across age groups; the rates were greater among whites than other races in

1995 and 1999, but comparable to that of other races in 1997 (Table I).⁴

Of female nursing home residents with an admitting or current diagnosis of incontinence in their medical records, 73.8% to 85.4% were identified by the National Nursing Home Survey as having difficulty controlling urination (Table II). Of the female nursing home residents carrying a diagnosis of urinary incontinence, 9.5% to 11.7% had an indwelling urethral catheter or ostomy (Table II). However, well over half of those with incontinence required another person's assistance when using the toilet, and almost one fourth required assistance from equipment when using the toilet.⁴

When the analysis was expanded to include all female nursing home residents (regardless of record-based continence status), 56.3% to 58.6% were identified as having difficulty controlling urination (Table III). This rate was stable between 1995 and 1999. More than one half (56.6%) required assistance from another person when using the toilet, and 15.2% required assistance from equipment. Those with an indwelling Foley catheter or ostomy constituted 8.2% of female nursing home residents.⁴

The demographic characteristics of the population were stable between 1995 and 1999. In all 3 years studied, nursing home residents with incontinence were older than those without incontinence. In 1999, 50.7% of incontinent women were 85 years old or older, 31.5% were 75 to 84 years old, and 17.8% were 74 years old or younger. In contrast, 41.5% of those women without incontinence were 85 years old or older, 32.2% were 75 to 84 years old, and 26.2% were 74 years old or younger. Race/ethnicity did not differ between the incontinent and continent nursing home residents. In 1999, 83.7% of incontinent women were white compared with 84.5% of continent women. African-American women comprised 11.0% of inconti-

TABLE II. Special needs of female nursing home residents with urinary incontinence

Category	1995		1997		1999	
	Count	Rate*	Count	Rate*	Count	Rate*
Has an indwelling Foley catheter or ostomy						
Yes	1,435	10,316 (2,864–17,768)	2,423	11,718 (5,311–18,125)	1,517	9,495 (2,892–16,099)
No	12,479	89,684 (82,232–97,136)	18,256	88,282 (81,875–94,689)	14,462	90,505 (83,901–97,108)
Requires assistance using the toilet						
Yes	9,847	70,766 (59,831–81,702)	14,237	68,846 (59,267–78,424)	8,898	55,684 (43,783–67,586)
No	2,475	17,789 (8,437–27,141)	2,794	13,511 (6,777–20,245)	3,234	20,238 (10,842–29,634)
Question skipped for allowed reason	1,592	11,444 (3,978–18,910)	3,405	16,464 (8,416–24,513)	3,847	24,077 (13,340–34,814)
Question left blank	0	0.0	244	1,179 (0–3,513)	0	0.0
Requires assistance from equipment when using the toilet						
Yes	3,214	23,095 (12,895–33,295)	4,464	21,587 (13,465–29,709)	2,821	17,653 (9,041–26,266)
No	6,472	46,513 (34,604–58,422)	9,056	43,793 (33,744–53,842)	5,876	36,771 (25,354–48,188)
Question skipped for allowed reason	4,068	29,234 (18,298–40,169)	6,199	29,976 (20,499–39,452)	7,081	44,316 (32,414–56,217)
Question left blank	161	1,159 (0–3,472)	960	4,644 (134–9,154)	201	1,260 (0–3,771)
Requires assistance from another person when using the toilet						
Yes	9,619	69,132 (58,007–80,256)	14,000	67,698 (58,032–77,365)	8,675	54,292 (42,379–66,205)
No	227	1,635 (0–4,864)	0	0.0	223	1,393 (0–4,164)
Question skipped for allowed reason	4,068	29,234 (18,298–40,169)	6,199	29,976 (20,499–39,452)	7,081	44,316 (32,414–56,217)
Question left blank	0	0.0	481	2,326 (0–5,563)	0	0.0
Has difficulty controlling urine						
Yes	10,695	76,859 (66,543–87,176)	15,255	73,772 (64,947–82,597)	13,648	85,412 (77,364–93,460)
No	2,266	16,287 (7,085–25,489)	3,966	19,176 (11,322–27,031)	1,786	11,180 (3,928–18,432)
Question skipped for allowed reason	954	6,854 (895–12,812)	1,458	7,052 (1,886–12,217)	545	3,408 (0–7,333)

Data from National Nursing Home Survey (NNHS), 1995, 1997, 1999.

Data in parentheses are 95% confidence intervals.

* Rate per 100,000 adult female nursing home residents with urinary incontinence in NNHS for that year.

TABLE III. Special needs of female nursing home residents regardless of continence status

Category	1995		1997		1999	
	Count	Rate*	Count	Rate*	Count	Rate*
Has indwelling Foley catheter or ostomy						
Yes	101,827	9,050 (8,281–9,819)	90,855	7,859 (7,151–8,566)	96,151	8,218 (7,484–8,951)
No	1,020,886	90,732 (89,954–91,510)	1,061,282	91,796 (91,072–92,520)	1,064,024	90,937 (90,162–91,712)
Question left blank	2,450	218 (89–347)	3,997	346 (182–510)	9,890	845 (571–1,120)
Requires assistance using the toilet						
Yes	659,035	58,572 (57,256–59,888)	652,615	56,448 (55,131–57,765)	670,006	57,262 (55,935–58,590)
No	286,946	25,503 (24,334–26,671)	280,242	24,240 (23,104–25,375)	273,104	23,341 (22,202–24,480)
Question skipped for allowed reason	173,839	15,450 (14,484–16,417)	216,408	18,718 (17,680–19,756)	218,971	18,714 (17,670–19,759)
Question left blank	5,343	475 (297–652)	6,870	594 (394–794)	7,983	682 (430–935)
Requires assistance from equipment when using the toilet						
Yes	182,812	16,248 (15,274–17,221)	180,518	15,614 (14,659–16,569)	178,305	15,239 (14,293–16,185)
No	460,230	40,903 (39,592–42,215)	433,640	37,508 (36,220–38,795)	467,351	39,942 (38,631–41,254)
Question skipped for allowed reason	460,785	40,953 (39,639–42,267)	496,649	42,958 (41,643–44,272)	492,075	42,055 (40,732–43,379)
Question left blank	21,336	1,896 (1,536–2,257)	45,327	3,921 (3,391–4,450)	32,334	2,763 (2,303–3,224)
Requires assistance from another person when using the toilet						
Yes	652,088	57,955 (56,636–59,274)	640,137	55,369 (54,048–56,689)	661,927	56,572 (55,242–57,901)
No	6,109	543 (345–741)	8,603	744 (511–977)	6,800	581 (384–779)
Question skipped for allowed reason	460,785	40,953 (39,639–42,267)	496,649	42,958 (41,643–44,272)	492,075	42,055 (40,732–43,379)
Question left blank	6,180	549 (357–741)	10,745	929 (681–1,178)	9,263	792 (527–1,056)
Has difficulty controlling urine						
Yes	633,123	56,269 (54,943–57,596)	672,699	58,185 (56,875–59,496)	685,747	58,608 (57,288–59,927)
No	424,287	37,709 (36,411–39,006)	422,839	36,574 (35,293–37,854)	422,162	36,080 (34,793–37,367)
Question skipped for allowed reason	64,822	5,761 (5,124–6,398)	57,080	4,937 (4,370–5,504)	55,713	4,761 (4,201–5,322)
Question left blank	2,931	260 (114–407)	3,517	304 (154–454)	6,444	551 (323–778)

Data from National Nursing Home Survey (NNHS), 1995, 1997, 1999.

Data in parentheses are 95% confidence intervals.

* Rate per 100,000 adult female nursing home residents in NNHS for that year.

ment and 10.0% of continent women, and Hispanic women comprised 2.8% of incontinent women and 3.3% of continent women.

COMMENT

Although less than 1.4% of female nursing home residents carried an admitting or current diagnosis of urinary incontinence, as defined using administrative data, the National Nursing Home Survey identified a much greater prevalence (58.6%) of bladder dysfunction among women living in nursing homes, according to the reports from the nursing home staff. More than one half of all female nursing home residents had difficulty controlling urination, and more than one half needed assistance in using the toilet. The sharp divergence of the National Nursing Home Survey's clinical and administrative data highlights the limitations of using medical records to study the prevalence of incontinence.⁴

Our findings are similar to those of Ouslander *et al.*,⁹ who found that 50% of elderly patients were incontinent of urine in seven nursing homes studied. Most had been incontinent at admission (64%), had more than one incontinent episode per day or a catheter (72%), and had concomitant fecal incontinence (64%). Similar to our findings from the residents' medical records, physicians recorded incontinence as a problem, or any efforts to evaluate it, in the nursing home records of less than 15% of residents.⁹ In a study of 52 nursing homes in upstate New York, Watson *et al.*¹⁰ also found that only 15% of residents with urinary incontinence had a history of incontinence as assessed and recorded by their clinician. Given that urinary incontinence is one of the main reasons that elderly patients in the United States are placed in nursing homes and outside independent living,^{6,9} by definition the prevalence of incontinence cannot be as low as that obtained from the medical records.

Our results are also similar to those reported from the Minimum Data Set, a standardized primary assessment of health status for all residents of long-term care facilities certified to participate in Medicare or Medicaid, which plays a key role in nursing home reimbursement and quality-of-care monitoring.^{11,12} Similar to the National Nursing Home Survey, the Minimum Data Set identifies the prevalence of incontinence in nursing home residents on the basis of the frequency of incontinence episodes. Using the Minimal Data Set data, Schnelle *et al.*¹³ found that the prevalence of incontinence in nursing homes ranged from 50% to 71%.

The Minimum Data Set is also used to measure the quality of care in nursing homes with metrics such as the rate of incontinence, weight loss, and use of physical restraints. The underlying assump-

tion is that differences in the quality of care explain differences in the prevalence of such conditions. However, only some quality measures have been shown to reflect real differences in the care actually delivered at different facilities.¹⁴ Schnelle *et al.*¹³ found that the Minimum Data Set incontinence quality indicators were not associated with clinically important differences in related care processes, such as the use of toilet plans for incontinent residents. The documentation of such quality indicators did not correlate with resident reports of the frequency of assistance.¹³ In another study that used resident interview data to score three Minimum Data Set quality indicators, 103 incontinent residents who were documented as being on a scheduled toilet program reported that they received the same number of toilet assists per day (1.3) as a group of 114 incontinent residents who were not on a scheduled toilet program.¹⁵ These findings call attention to the importance of the reliability of quality-of-care data used to grade healthcare facilities. The prevalence of incontinence is one such quality metric, and by one administrative measure in our study (the medical record), nursing homes in the National Nursing Home Survey had very few incontinent residents, suggesting a high level of quality. However, by another measure within the same survey (caregiver interviews), the rate of incontinence was almost 50 times greater.

In the National Nursing Home Survey, when queries about bladder function were expanded to include assistance needed from nursing home staff, a high prevalence of bladder dysfunction was apparent. Requiring assistance using the toilet may not necessarily result from bladder dysfunction, but rather from other associated comorbidities such as weakness or gait instability. However, because urinary leakage will occur if no assistance is provided, incorporating the need for assistance using the toilet into the definition of incontinence may increase its sensitivity. Our findings should compel policy makers, researchers, and other stakeholders to pay particular attention to the method of collecting information on incontinence in nursing home residents.

Incontinence remains a serious problem in nursing homes, where 1.72 million American adults lived in 2000.¹⁶ Our observations are consistent with the findings of Wagner and Hu,¹ who calculated that more than 850,000 nursing home residents (50%) have urinary incontinence. Studies examining risk factors for incontinence have found that multiple medical morbidities, immobility, and cognitive impairment are linked to greater rates of urinary incontinence.¹⁷ As measurements of quality become more important, medical records should not be used to assess urinary incontinence. That so few

women had an admitting diagnosis of urinary incontinence in their medical records demonstrates the underreporting of this condition by many physicians.

The demographic characteristics of the population were stable from 1995 to 1999. As might be expected, female nursing home residents with incontinence were older than continent residents. No major differences were found in race/ethnicity between the continent and incontinent women in this population. This contrasts with findings from population-based studies that reported greater rates of urinary incontinence among non-Hispanic whites than among other racial or ethnic groups.⁴ However, because incontinence is a risk factor for nursing home admission, the prevalence of incontinence in the nursing home population is likely not representative of community-dwelling adults. Also, given the small percentage of minority nursing home residents, the racial demographics of the incontinent nursing home population may not have been accurately characterized. We also found that incontinence rates among women in nursing homes remained stable through the mid to late 1990s, regardless of the method of measurement. However, given the expected demographic shifts in the population, as the absolute number of nursing home residents increases, so will the number with incontinence.

Our study had several limitations. The National Nursing Home Survey does not contain detailed information on the health services provided. Rather, it reports only whether a resident received services within general categories. For example, the frequency with which residents receive assistance using the toilet, which directly affects their number of leakage episodes, was not measured. In addition, the number of incontinence episodes was not measured; therefore, we could not assess the severity of incontinence among female nursing home residents. Also, incontinence may be missed or go unnoticed by a resident or caregiver, especially when a resident wears diapers or pads for fecal incontinence, resulting in an underestimation of the prevalence of urinary incontinence. Alternatively, it is possible that we overestimated the incontinence prevalence, because "difficulty controlling urination" may be noted by caregivers when the resident has significant urinary urgency without urge incontinence. In addition, a number of patients wear pads or diapers because of poor mobility, and although they do not have involuntary urine loss, they must voluntarily void into diapers when unable to reach a bathroom. Finally, questionnaire-based surveys can be subject to response bias and inaccurate reporting. When survey questions are skipped, inaccurate estimations of continence rates may result.

Approximately 5% of older Americans reside in one of more than 17,000 nursing homes at any time.^{18,19} Kemper and Murtaugh²⁰ estimated that 37% of older people, aged 65 years or older, will spend some time in a nursing home.^{18,20} The Bureau of the Census recently reported that the median age of the U.S. population in 2000 was the oldest it has ever been, reflecting the aging of the "baby boomers."¹⁶ The retirement of this generation, which will start in the next decade, will affect the entire social services network. Given the high prevalence of urinary incontinence among nursing home residents demonstrated in this study, one of the challenges in the near future will be to identify cost-effective interventions for incontinence in the face of a surge of nursing home residents burdened by this condition.^{1,21}

CONCLUSIONS

Although only 1% to 2% of nursing home residents carry a diagnosis of incontinence using a chart-based definition, our analysis of caregiver assessment data from the National Nursing Home Survey revealed that a much greater proportion of residents are actually incontinent of urine. These findings highlight the limitations of using administrative data to study the prevalence of incontinence. We are compelled to pay particular attention to the method of data collection regarding incontinence in nursing home residents. Quality must be measured accurately to inform public policy in this area.

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