Published in final edited form as:

J Urol. 2016 May ; 195(5): 1512–1516. doi:10.1016/j.juro.2015.11.046.

NOCTURNAL ENURESIS AS A RISK FACTOR FOR FALLS IN OLDER COMMUNITY-DWELLING WOMEN WITH URINARY INCONTINENCE

Avita K. Pahwa¹, Uduak U. Andy¹, Diane K. Newman², Hanna Stambakio³, Kathryn H. Schmitz, and Lily A. Arya¹

¹Division of Urogynecology, Department of Obstetrics and Gynecology, University of Pennsylvania

²Division of Urology, Department of Surgery, University of Pennsylvania

³Women's Health Clinical Research Center, University of Pennsylvania

⁴Division of Epidemiology, Department of Biostatistics and Epidemiology, University of Pennsylvania

Abstract

Purpose—To determine the association between urinary symptoms, fall risk and physical limitations in older community-dwelling women with urinary incontinence (UI).

Materials and Methods—In-depth assessment of day and nighttime urinary symptoms, fall risk, physical function, physical performance tests and mental function in older community-dwelling women with UI and who had not sought care for their urinary symptoms. All assessments were performed in the participants' homes. We used univariable and multivariable linear regression to examine the relationship of urinary symptoms with fall risk, physical function, and physical performance.

Results—In 37 women with UI (mean age 74 ± 8.4 years), 48% were at high risk for falls. Nocturnal enuresis was reported by 50%. Increased fall risk was associated with increasing frequency of nocturnal enuresis ($p=0.04$), worse lower limb ($p<0.001$) and worse upper limb ($p<0.0001$) function and worse performance on a composite physical performance test of strength, gait and balance ($p=0.02$). Women with nocturnal enuresis had significantly lower median physical performance test scores (7, range 0, 11) than women without nocturnal enuresis (median 9, range 1, 12, $p=0.04$). In a multivariable regression model that included age, nocturnal enuresis episodes and physical function, only physical function was associated with increased fall risk ($p<0.0001$).

Conclusion—Nocturnal enuresis is common in older community-dwelling women with UI and may serve as a marker for fall risk even in women not seeking care for their urinary symptoms.

Correspondence: Avita K. Pahwa, MD, 1000 Courtyard, Ravdin, 3400 Spruce Street, Philadelphia, PA 19104, Phone: (215) 615-6566, Fax: (215) 662-7929, avita.pahwa@uphs.upenn.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Interventions targeting upper and lower body physical function could potentially reduce risk of falls in older women with UI.

Keywords

urinary incontinence; older women; accidental falls; nocturnal enuresis; physical function

INTRODUCTION

Falls are a common, morbid, and costly problem amongst older women, occurring in more than 30% women over the age of 65 years.¹⁻³ As the United States' aging population increases, the projected burden of falls will increase emergency room visits, fall-related hospitalizations, health care costs, morbidity, and mortality.⁴

Several large epidemiological studies suggest that older women with urinary incontinence (UI) are at high risk for falls.⁵⁻⁶ In a meta-analysis, the increased risk for falls was 1.54 in women with urgency UI and 1.92 in women with mixed UI.⁷ The risk of falls is especially high in older community-dwelling women because as many as 32% of older women may not seek care for their UI.⁸

Older women with UI are at increased risk of falls potentially due to associated limitations in physical function.⁹ Limitations in physical function may involve upper or lower body physical function or both.¹⁰ Urinary symptoms may also contribute to fall risk. A potential theoretical model is one in which a woman with urinary urgency falls on the way to the bathroom due to poor balance and weak lower limb function.¹¹ Limitations in upper body physical function could hypothetically reduce an older woman's ability to grab supporting structures such as walker, rail, or doorjamb as she rushes to the bathroom. Though older women with UI represent a population that is at high risk for falls, the precise type of physical limitation, upper or lower body or both, in older women with UI is not known. Identification of the type of limitations in physical function, especially in community-dwelling women not seeking care for UI, will allow the development of targeted interventions for preventing falls in older women with UI.

The aim of this study was to examine the relationship between urinary symptoms, fall risk and several types of physical limitations in older community-dwelling women with UI.

METHODS AND METHODS

We performed a prospective cross-sectional study of older community-dwelling women with UI and who were not actively seeking treatment for their UI. Participants were recruited from three area senior community centers in a large metropolitan city. Eligible patients were women age 65 years or older, community-dwelling, ambulatory, with moderate to severe UI as measured by a score of ≥ 6 on the International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form (ICIQ-UI SF).¹² Exclusion criteria were participants' self-report of seeking any medical or nonmedical treatment for urinary symptoms (other than a urinary tract infection) in the previous twelve months from a healthcare provider (physician, nurse practitioner or physical therapist). The study was

approved by the University of Pennsylvania Institutional Review Board and all participants provided written informed consent.

All assessments including validated questionnaires and physical performance tests were performed by a trained research assistant in the subject's home.

UI severity and impact on quality of life was measured using the ICIQ-UI SF.¹² The questionnaire measures frequency of urinary leakage, severity of leakage, type of leakage (stress or urge) and impact of leakage on quality of life. Total score reflects overall severity of UI, score range 0 to 21 and higher scores indicate more severe UI. Score of 6 to 12 indicate moderate UI, 13 to 18 severe UI, and 19 to 21 very severe UI.¹³ Stress UI is reported as leakage with cough, sneeze, physical activity, or exercise and urgency UI as leakage before getting to the toilet. Scores of the impact of UI on quality of life range from 0 to 10 with higher scores representing greater impact. Assessment of self-management practices for UI was evaluated with the Incontinence Resource Utilization Questionnaire (IRUQ) for use of specific incontinence protection products.¹⁴

Nocturia was defined as getting up at least once at night to urinate and bothersome nocturia was defined as getting up at least twice at night to urinate.^{15–16} Nocturnal enuresis was defined as the loss of urine occurring during sleep, independent of nocturia or urgency UI.¹⁵ Nighttime urinary symptoms were measured using the Nocturia, Nocturnal Enuresis, and Sleep Interruption Questionnaire (NNES-Q).¹⁷ The 12-item questionnaire measures frequency of nocturia and nocturnal enuresis and the extent of bother from these symptoms. Sleep interruption due to urge to void or bedwetting is differentiated from other causes of sleep disruption. In the NNES-Q questionnaire, presence and severity of nocturnal enuresis are defined by response to the question “Have you leaked urine while you were sleeping?” Possible responses include “never,” “once a week or less often,” “2–3 times a week,” “4–6 times a week,” and “every night.”

Fall risk was assessed using the Activities Balance Specific (ABC) Scale.¹⁸ The 16-item questionnaire asks subjects to rate their confidence levels when asked to complete various physical activities in situation-specific scenarios e.g. when climbing stairs, reaching for objects above head level, sweeping the floor, and getting in and out of a car. The questionnaire measures fall risk by evaluating loss of confidence with balance, specifically among highly functioning seniors.¹⁸ Score range 0 to 100 and lower scores indicate higher fall risk. Scores less than 67 are predictive of future falls.¹⁹

Physical function was assessed using validated questionnaires and in-home physical performance testing. The Late Life Function and Disability Instrument (LLFDI) is a validated questionnaire that measures physical functioning across a wide variety of daily activities, e.g. unscrewing a jar lid, using utensils for meal preparation, moving a kitchen chair, and climbing stairs.²⁰ Scores measure overall physical function as well as domains specific to upper and lower extremities. Total scores range from 14 to 74, higher scores indicating higher level of physical function.

Objective assessment of physical performance was done using the Short Physical Performance Battery (SPPB) test. The SPPB is a real time physical performance test used

extensively in community-dwelling older adults to assess physical health and functional performance.^{21–22} The test involves assessment of standing balance, a timed 4-meter walk, and 5 repetitions of rising from a chair and sitting down. Scores measure subdomains of strength, gait and balance, and total scores measure physical functioning.^{21–22} Subdomain scores range from 0 to 4; total scores range from 0 to 12 with higher scores indicating better body function.

Daytime sleepiness was measured using the Epworth Sleepiness Scale questionnaire to assess level of sleepiness during ordinary life situations, e.g. watching television, driving, conversing with someone. The possible range of scores is from 0 to 24, with higher scores correlating with increasing sleepiness.²³

Mental status was assessed using the Mini Cog, a brief cognitive screening test based on mental recall of words and drawing the face of a clock.²⁴ Patients are classified as having impaired cognition if they had a score of less than 3. Number of comorbidities was measured using the Charlson comorbidity index.²⁵

Demographic data, urinary symptoms, fall risk and physical function were described using percentages for categorical variables. Continuous variables were described using medians with range (urinary symptom score, physical performance test SPPB score) or means with standard deviations (age, physical function LLFDI score) as appropriate. Fall risk and physical function of women with and without specific urinary symptoms were compared using Mann-Whitney or Kruskal-Wallis test for continuous variables and chi-square tests for categorical variables. We used univariable and multivariable linear regression to examine the relationship of urinary symptoms with fall risk, physical function and physical performance test scores. All analyses were performed in STATA version 13 (StataCorp LP 2013, College Station, TX). Statistical tests were two-sided and $p < 0.05$ was considered statistically significant.

RESULTS

A total of 37 community-dwelling ambulatory women were enrolled for the study. Demographic data, data on urinary symptoms, fall risk, physical function and physical performance tests are shown in Table 1.

Median (range) UI severity score was 13 (7, 19). No woman had mild UI, and over 50% had severe or very severe UI (Table 1). The prevalence of nocturia¹, nocturia² and nocturnal enuresis was high being 97%, 68% and 50% respectively. In this cohort of women who were not seeking care for UI, 28 (67%) used protective products, primarily menstrual pads, for urine leakage, and 35 (95%) women reported score of 3 or higher (worse urinary-specific quality of life) on the ICIQ-UI SF.²⁶ Based on a cut off score of 67 on the ABC scale, 18 women (48%) were at high risk for future fall. Only 2 (5%) women were taking sedating medications (narcotics, benzodiazepines, over the counter sleep aids, anti-histamines) known to increase fall risk. Number of comorbidities, impaired cognition, and sedating medications were not associated with increased fall risk ($p > 0.05$).

While severity of UI ($p=0.87$) and severity of nocturia ($p=0.08$) were not associated with increased risk of falls, increasing frequency of nocturnal enuresis was significantly associated with increasing risk of falls ($p=0.04$) (Table 2). Among women with nocturnal enuresis, 11 women (61%) had a fall risk score of <67 (very high risk for falls). The use of disposable undergarment products for UI was associated with presence of nocturnal enuresis ($p=0.04$).

Increasing frequency of nocturnal enuresis was also significantly associated with worse LLFDI physical function score ($p=0.04$) and worse SPPB physical performance test score ($p=0.02$). The mean overall LLFDI physical function score of women with nocturnal enuresis (45.8 ± 2.7) was significantly worse than that of women without nocturnal enuresis (53.3 ± 2 , $p=0.03$). Similarly, the median (range) overall SPPB score of women with nocturnal enuresis was 7, (0, 11), which was significantly lower than those of women without nocturnal enuresis, 9 (1, 12, $p=0.04$).

We noted a significant relationship between increased fall risk and worse overall physical function ($p<0.001$), worse basic lower extremity function ($p<0.001$), worse advanced lower extremity function ($p<0.001$) and worse upper limb function ($p<0.0001$), and worse performance on physical function test ($p = .02$). The association of fall risk with subdomain scores of the SPPB reached marginal statistical significance including decreased strength ($p=0.06$), poor gait ($p=0.06$) and worse balance ($p=0.05$).

Daytime sleepiness was associated with significantly increased risk of falls ($p=0.03$). A relationship between number of episodes of nocturia and daytime sleepiness was not observed ($p=0.16$). Nocturnal enuresis occurring four to six times a week or more was significantly associated with daytime sleepiness ($p=0.04$). Based on the NNES-Q, the median (range) condition specific quality of life score of women with nocturnal enuresis (8 (2, 10)) was significantly worse than that of women without nocturnal enuresis of (0, (0, 0), $p<0.0001$). There was no significant difference in the median Minicog score of women with and without nocturnal enuresis (1 vs. 1, $p=0.72$).

In a multivariable regression model that included age, physical function, and frequency of nocturnal enuresis episodes, only physical function was significantly associated with increased fall risk ($p<0.0001$).

DISCUSSION

Prior studies have reported women with nocturia are at high risk of falls.^{27–28} We report a high prevalence (50%) of nocturnal enuresis, or bedwetting in community-dwelling women with UI and who are not seeking care for their UI. Furthermore, women with nocturnal enuresis are at high risk for falls (score < 67) and perform worse on physical function tests than women who do not report this symptom. In women with UI, increased fall risk is also associated with worse upper and lower body physical function.

Our findings will be useful for developing exercise programs for preventing falls in older women with UI. Though we were unable to identify worse performance on a specific physical function test that is associated with increased fall risk, poor overall score on a

composite test of strength, gait and balance increased the risk for falls. Our findings suggest that interventions for reducing falls in older women with UI should address multiple domains of physical function including upper and lower body physical function.

The poor performance on physical performance tests helps to elucidate possible mechanisms for both bedwetting and increased fall risk in women with nocturnal enuresis. It is likely that older women with nocturnal enuresis and poor physical function wet the bed because they are unable to get out of the bed quickly enough to reach the bathroom. The poor physical function also contributes to their increased fall risk. In our study, nocturnal enuresis but not nocturia was associated with increased daytime sleepiness suggesting that nighttime events that lead to changing of clothes and/or bed sheets potentially disturb sleep more than nocturia alone. Therefore, daytime sleepiness is an additional mechanism through which nocturnal enuresis potentially contributes to increase fall risk. Though prior studies have implicated poor cognition as a risk factor for both falls and UI in older institutionalized adults, we did not find poor cognition to be a significant contributory factor to fall risk in older community-dwelling women with UI.^{2,29}

Our findings suggest that nocturnal enuresis could serve as a potential marker that providers and caregivers could use to identify women at increased risk for falls. Though women with nocturnal enuresis reported significant impact of UI on their quality of life, these women had not sought treatment for their incontinence. Prior studies suggest that older women may accept incontinence as a 'normal' part of aging.³⁰ Given that nocturnal enuresis in community-dwelling women is closely associated with a potentially life threatening condition such as a fall, providers taking care of older women with UI may find it useful to ask specific questions about nocturnal enuresis and offer treatment options as a possible intervention to decrease fall risk.

Strengths of our study include our population of older community-dwelling ambulatory women, detailed assessment of physical function using validated questionnaires, measurement of nighttime incontinence and objective physical performance tests within participants' homes. Our study is limited by its small sample size that may limit the generalizability of our findings. Additionally, data on specific comorbidities that may potentially affect nocturnal enuresis, such as obstructive sleep apnea, was not collected. Future studies comparing fall risk and sleep apnea in older community-dwelling women with and without nocturnal enuresis will help validate the findings of our study.

In summary, interventions to prevent falls in older women with UI must be directed at improving multiple domains of physical function including upper and lower body strength, gait, and balance. Nocturnal enuresis is common in older community-dwelling women with UI and may serve as a marker for fall risk even in women who are not seeking care for their urinary symptoms.

Acknowledgments

Funding: Perelman School of Medicine PCOR-Pilot grant

Dr. Newman's efforts supported in part by NIH grant 1R01NR012011-01

Dr. Schmitz's efforts supported in part by NIH grant U54-CA155850

Key of Definitions for Abbreviations

ABC	Activates Balance Specific Scale
ICIQ-UI SF	International Consultation on Incontinence Questionnaire – Urinary Incontinence Short Form
LLFDI	Late Life Function and Disability Instrument
NNES-Q	Nocturia, Nocturnal Enuresis, and Sleep Interruption Questionnaire
SPPB	Short Physical Performance Battery Test
UI	urinary incontinence

References

1. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. *NEJM*. 1988; 319:1707. [PubMed: 3060722]
2. Stalenhoef PA, Diederiks JP, de Witte LP, et al. Impact of gait problems and falls on functioning in independent living persons of 55 years and over: a community survey. *Patient Educ Couns*. 1999; 36:23. [PubMed: 10036557]
3. Stevens JA, Corso PS, Finkelstein EA, et al. The costs of fatal and non-fatal falls among older adults. *Inj Prev*. 2006; 12:290.
4. Centers for Disease Control and Prevention (CDC). Public health and aging: nonfatal injuries among older adults treated in hospital emergency departments--United States, 2001. *MMWR Morb Mortal Wkly Rep*. 2003; 52:1019. [PubMed: 14574277]
5. Bresee C, Dubina ED, Khan AA, et al. Prevalence and correlates of urinary incontinence among older community-dwelling women. *Female Pelvic Med Reconstr Surg*. 2014; 20:328. [PubMed: 25185631]
6. Chandra A, Crane SJ, Tung EE, et al. Patient-reported geriatric symptoms as risk factors for hospitalization and emergency department visits. *Aging Dis*. 2015; 6:188. [PubMed: 26029477]
7. Chiarelli PE, Mackenzie LA, Osmotherly PG. Urinary incontinence is associated with an increase in falls: a systematic review. *Aust J Physiother*. 2009; 55:89. [PubMed: 19463079]
8. Waetjen LE, Xing G, Johnson WO, et al. Study of Women's Health Across the Nation (SWAN). Factors associated with seeking treatment for urinary incontinence during the menopausal transition. *Obstet Gynecol*. 2015; 125:1071. [PubMed: 25932834]
9. Huang AJ, Brown JS, Thom DH, et al. Study of Osteoporotic Fractures Research Group. Urinary incontinence in older community-dwelling women: the role of cognitive and physical function decline. *Obstet Gynecol*. 2007; 109:909. [PubMed: 17400853]
10. McAuley E, Konopack JF, Motl RW, et al. Measuring disability and function in older women: psychometric properties of the late-life function and disability instrument. *J Gerontol A Biol Sci Med Sci*. 2005; 60:901. [PubMed: 16079215]
11. Miles TP, Palmer RF, Espino DV, et al. New-onset incontinence and markers of frailty: data from the Hispanic Established Populations for Epidemiologic Studies of the Elderly. *J Gerontol A Biol Sci Med Sci*. 2001; 56:M19. [PubMed: 11193227]
12. Avery K, Donovan J, Peters TJ, et al. ICIQ: A brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn*. 2004; 23:322. [PubMed: 15227649]
13. Klovning A, Avery K, Sandvik H, et al. Comparison of two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the incontinence severity index. *Neurourol Urodyn*. 2009; 28:411. [PubMed: 19214996]

14. Subak LL, Brown JS, Kraus SR, et al. The “costs” of urinary incontinence for women. *Obstet Gynecol.* 2006; 107:908. [PubMed: 16582131]
15. Haylen BT, Freeman RM, Lee J, et al. International Urogynecological Association; International Continence Society. International Urogynecological Association (IUGA)/International Continence Society (ICS) joint terminology and classification of the complications related to native tissue female pelvic floor surgery. *Neurourol Urodyn.* 2012; 31:406. [PubMed: 22517067]
16. Bosch JL, Weiss JP. The prevalence and causes of nocturia. *J Urol.* 2010; 184:440. [PubMed: 20620395]
17. Abraham L, Hareendran A, Mills IW, et al. Development and validation of a quality-of-life measure for men with nocturia. *Urology.* 2004; 63:481. [PubMed: 15028442]
18. Powell LE, Myers AM. The Activities-specific Balance Confidence (ABC) Scale. *J Gerontol Med Sci.* 1995; 50:M28.
19. Lajoie Y, Gallagher SP. Predicting falls within the elderly community: comparison of postural sway, reaction time, the Berg balance scale and the Activities-specific Balance Confidence (ABC) scale for comparing fallers and non-fallers. *Arch Gerontol Geriatr.* 2004; 38:11. [PubMed: 14599700]
20. Haley SM, Jette AM, Coster WJ. Late life function and disability instrument: II. Development and evaluation of the function component. *J Gerontol A Biol Sci Med Sci.* 2002; 57:M217. [PubMed: 11909886]
21. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. *J Gerontol.* 1994; 49:M85. [PubMed: 8126356]
22. Bean JF, Olveczky DD, Kiely DK, et al. Performance-based versus patient-reported physical function: what are the underlying predictors? *Phys Ther.* 2011; 91:1804. [PubMed: 22003163]
23. Johns MW. A new method for measuring daytime sleepiness: The Epworth sleepiness scale. *Sleep.* 1991; 14:540. [PubMed: 1798888]
24. Borson S, Scanlan J, Brush M, et al. The mini-cog: a cognitive ‘vital signs’ measure for dementia screening in multi-lingual elderly. *Int J Geriatr Psychiatry.* 2000; 15:1021. [PubMed: 11113982]
25. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis.* 1987; 40:373. [PubMed: 3558716]
26. Abrams P, Smith AP, Cotterill N. The impact of urinary incontinence on health-related quality of life (HRQoL) in a real-world population of women aged 45–60 years: results from a survey in France, Germany, the UK and the USA. *BJU Int.* 2015; 115:143. [PubMed: 24958472]
27. Brown J, Vittinghoff E, Wyman J, et al. Urinary incontinence: does it increase risk for falls and fractures? Study of Osteoporotic Fractures Research Group. *Journal of the American Geriatrics Society.* 2000; 48:721. [PubMed: 10894308]
28. Takazawa K, Arisawa K. Relationship between the type of urinary incontinence and falls among frail elderly women in Japan. *J Med Invest.* 2005; 52:165. [PubMed: 16167534]
29. Gosch M, Talasz H, Nicholas JA, et al. Urinary incontinence and poor functional status in fragility fracture patients: an underrecognized and underappreciated association. *Arch Orthop Trauma Surg.* 2015; 135:59. [PubMed: 25399238]
30. Siddiqui NY, Levin PJ, Phadtare A, et al. Perceptions about female urinary incontinence: a systematic review. *Int Urogynecol J.* 2014; 25:863. [PubMed: 24310988]

Table 1

Demographic Data of older community dwelling women with urinary incontinence (n = 37)

Demographics	
Age (mean, SD)	74 (8.4)
Race (n, %)	
White	23 (62)
African-American	13 (35)
Other	1 (3)
Impaired cognition ¹ (n, %)	11 (30)
Daytime sleepiness score ² (median, range)	8 (0, 21)
Number of co-morbidities (median, range)	4 (0, 7)
Falls risk score ³ (median, range)	66.9 (33.8, 96.3)
Urinary Symptoms ⁴ (n, %)	
Use of incontinence protective products	28 (76)
Urinary incontinence severity score (median, range)	13 (7, 19)
Urinary QOL score (median, range)	6 (1, 10)
Urge urinary incontinence only	15 (40)
Stress urinary incontinence only	3 (8)
Mixed urinary incontinence	18 (49)
Nocturia (≥ 2 voids per night)	25 (68)
Nocturnal enuresis (≥ 1 episode per week)	18 (50)
Severity of Urinary Incontinence ⁴ (n, %)	
Moderate	15 (40)
Severe	19 (51)
Very severe	3 (8)
Physical Function ⁵ (mean, SD)	
Basic Lower Limb	15.5 (3.9)
Advanced Lower Limb	14 (5.1)
Upper Limb	20 (3.9)
Total	49.5 (10.8)
Physical Performance ⁶ (median, range)	
Strength	3 (0, 4)
Balance	3 (0, 4)
Gait	2 (0, 4)
Total	8 (0, 12)

¹ Mini Cog test score < 3² Epworth Sleepiness Scale questionnaire (possible score range 0 to 24, lower score indicating decreased sleepiness)³ Activities Balance Specific (ABC scale) (possible score range 0 to 100, lower score indicating increased fall risk)

⁴Incontinence Questionnaire – Urinary Incontinence Short Form (ICIQ-UI SF) (possible total score range 0 to 21, lower score indicating less severe incontinence)

⁵Late Life Function and Disability Instrument (possible total score range 14 to 74, lower score indicating lower function)

⁶Short Physical Performance Battery (SPPB) test (possible total score 0 to 12, lower score indicating lower performance)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Relationship between nocturnal enuresis and falls risk

Nocturnal Enuresis Frequency (n, %)	Falls Score* (range)
0 times per week (18, 50.0)	74.7 (46.8, 96.3)
1 times per week (9, 25.0)	58.8 (42.5, 91.2)
2 to 3 times per week (3, 8.3)	77.5 (58.8, 80.0)
4 to 6 times per week (1, 2.8)	33.8 (33.8, 33.8)
Every night (5, 13.9)	46.9 (35.0, 80.6)

*
p = .04, Kruskal Wallis rank test

* Derived from Activities Balance Specific Scale questionnaire; data is median falls score, range is 0 to 100 and higher score indicates lower risk of fall.