



Published in final edited form as:

Obstet Gynecol. 2015 May ; 125(5): 1071–1079. doi:10.1097/AOG.0000000000000808.

Factors Associated With Seeking Treatment for Urinary Incontinence During the Menopausal Transition

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Abstract

Objective—To examine whether longitudinal urinary incontinence (UI) characteristics, race or ethnicity, socioeconomic status, and education were associated with UI treatment-seeking in a prospective cohort of community-dwelling midlife women.

Methods—We analyzed data from 9 years of the Study of Women's Health Across the Nation (SWAN). The study asked participants reporting at least monthly UI about seeking treatment for their UI at baseline and in visit years 7, 8 and 9. Our main covariates included self-reported race or ethnicity, income, level of difficulty paying for basics, and education level. We used multiple logistic regression to examine associations between demographic, psychosocial, and longitudinal UI characteristics and whether women sought UI treatment. We explored interactions by race or ethnicity, socioeconomic status measures, and education level.

Results—A total of 1550 women (68% of women with UI) reported seeking treatment for UI over the 9 years of this study. In multivariable analyses, women had higher odds of seeking treatment when UI in the year prior to seeking treatment was more frequent (adjusted odds ratio (aOR) 3.16, 95% confidence interval (CI) 1.15–8.67) and more bothersome (aOR 1.09, 95% CI 1.01–1.18), with longer symptom duration, and with worsening UI symptoms (aOR 1.75, 95% CI 1.01–3.04). Women who saw physicians regularly, had more preventive women's health visits, or both were more likely to seek UI treatment (aOR 1.18, 95% CI 1.07, 1.30). Race or ethnicity, socioeconomic measures, and education were not significantly related to seeking treatment for UI.

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^{*}For a list of the SWAN principal investigators, steering committee chairs, and NIH program officers, see the Appendix online at <http://links.lww.com/xxx>.

Financial Disclosure: The authors did not report any potential conflicts of interest.

The content of this manuscript is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH.

Conclusion—We found no evidence of racial or ethnic, socioeconomic or education level disparities in UI treatment-seeking. Rather, longitudinal UI characteristics were most strongly associated with treatment-seeking behavior in midlife women.

Introduction

Urinary incontinence (UI) is a frequent problem in mid-life and older women¹. About 45% of mid-life women between the ages of 45–55 years report UI occurring at least a few times per month, and about 15% report daily UI². UI can affect women's lives negatively, leading to decreased quality of life^{3–6} and significant morbidity, such as functional decline⁷ and increased risk of falls and fractures in the elderly⁸.

Many effective treatments are available to women for any level of UI, including behavioral (e.g., limiting fluid intake, changing voiding habits), pelvic floor muscle exercises, pessaries, medications, and surgery⁹. In cross-sectional studies, less than half of women with UI tell health care providers about their problem^{10–13}. These studies have identified factors associated with UI treatment-seeking, such as male gender¹¹, greater social support¹⁴, and higher use of other health care services¹⁴.

Gaps in knowledge about disparities in UI treatment-seeking still exist. It is not known if changes in UI characteristics and physical, social, and psychological factors over time may affect whether women seek UI treatment. Even less clear is whether UI duration, changes in UI frequency and other factors associated with seeking treatment might differ between racial or ethnic, socioeconomic, educational backgrounds, or a combination of these. The present analyses explored potential disparities in UI treatment-seeking in a racial or ethnically diverse cohort of community-dwelling midlife women followed longitudinally over 9 years.

Materials and Methods

This is a secondary analysis of data from the Study of Women's Health Across the Nation (SWAN) from 1996–2007. The Study of Women's Health Across the Nation is a multi-center, multi-racial or ethnic prospective cohort study investigating longitudinally the biological and psychosocial characteristics and common symptoms of midlife women across the menopausal transition. Briefly, from a sample of women recruited by random-digit-dialing and list-based sampling, each site of seven sites recruited approximately 450 women for Study of Women's Health Across the Nation, consisting of about 50% white (non-Hispanic) women and 50% women from one designated minority racial or ethnic group. In this study, we included all women from six of the clinical sites (Pittsburgh, Oakland, Los Angeles, Detroit, Chicago, Boston) representing white (non-Hispanic), black, Chinese and Japanese women. We could not include the white (non-Hispanic) and Hispanic women from the New Jersey site as questionnaires were not administered there during the years of this investigation. Study of Women's Health Across the Nation enrollment inclusion criteria included: age 42–52 years, self-identification as black; Japanese, Chinese, Hispanic or white, premenopausal or early perimenopausal status. Enrollment exclusion criteria included: inability to speak English, Japanese, or Cantonese; hysterectomy and/or bilateral oophorectomy, on any hormonal medications, or pregnant or lactating. The study protocol

was approved by all institutional review boards, and participants provided written, informed consent.

Based on data from Study of Women's Health Across the Nation questionnaires that were self-administered (6th grade reading level) at an approximately annual in-person visit, we created variables to describe UI characteristics as follows. We defined responses to the question "In the last month, about how many times have you leaked urine, even a small amount?" as daily for "almost daily or daily," weekly for "several days per week," monthly for "less than one day per week" and no clinically significant UI as "less than once per month" or none. We defined UI type by responses to the question "under what circumstances does leakage occur?" We defined women who reported leakage with "coughing, laughing, sneezing, jumping up and down, with physical activity" as having stress UI, while women who reported leakage with "when you have the urge to void and can't reach the toilet fast enough" as having urge UI. We defined mixed UI when women responded positively to both circumstances of leakage. Finally, women who reported UI at any time point and then reported an increase in frequency from one annual visit to the next were considered to have worsening UI, i.e. from no regular UI to monthly or more, from monthly to weekly or more or from weekly to daily. We considered women who reported a decrease in frequency of UI from one annual visit to the next as having improving UI. In the same in-person visit self-administered questionnaire, participants reported on treatment-seeking behaviors for UI by responding yes or no to the following question that Study of Women's Health Across the Nation included at baseline and in visits 7, 8 and 9: "Have you ever discussed your leakage with a doctor, nurse, or other health care professional?" after they had responded "yes" to a stem question: "Have you ever leaked urine, even a small amount?"

Covariates included self-reported race or ethnicity, income, and education level, level of difficulty in paying for basics, depressive¹⁵ and anxiety symptoms¹⁶, social support or network¹⁷, and experience of discrimination¹⁸, medical history and health care utilization. We calculated body mass index (weight/height²) based on measurements obtained by calibrated balance beam scale and by stadiometer. Study of Women's Health Across the Nation defined menopause status using Stages of Reproductive Aging Workshop (STRAW) criteria¹⁹. We created summary variables for the patterns of UI and these other variables as in prior publications^{2,20,21}.

Women in our main analytic sample were those who remained in the study, reported UI at any visit, and responded to the treatment-seeking questions in visits 7, 8 or 9, or were presumed to have not sought treatment (Figure 1). We examined bivariate associations with seeking treatment using chi-squared tests for categorical variables and t-tests for continuous variables. We then used multiple logistic regression analysis, exploring forward, backward and stepwise methods to examine the associations between demographic, psychosocial, physical, health care, and UI characteristic variables and UI treatment-seeking across the first nine years of cohort observation. We chose our independent variables *a priori* based on the literature^{2,6,14} and from our bivariate analysis when p-values were ≤ 0.3 . We selected our models based on best fit, defined as the lowest Akaike Information Criterion (AIC)²².

We examined interactions in two ways. First, we developed stratified models using our primary independent variables: racial or ethnic category, socioeconomic status, and education. Second, we explored interaction between UI frequency and UI duration and each of these variables within our main model by entering these combinations as interaction terms.

Because women were questioned about UI treatment-seeking behaviors at baseline and then not until visit 7, we could not determine when during that 8-year interval women actually sought treatment and thus which factors preceded treatment-seeking behavior. To address this, we secondarily examined multivariable models in a subsample of women who had not reported seeking treatment before visit 7, following them through visit 9.

A subset of Study of Women's Health Across the Nation-incontinent women had missing data because, although they reported UI one or more times prior to visit 7, they answered the stem question "Have you ever leaked urine, even a small amount" at visit 7, 8 and/or 9 negatively (N = 364), and thus did not respond to our treatment-seeking questions. To evaluate the potential bias this non-response could have on our results, we compared two sampling strategies. First, we counted the 364 women as missing and did not include them in what we defined as the limited analytic sample. Second, we assumed that these 364 incontinent women who responded negatively the stem question would not likely have sought treatment. For these women, we imputed "no UI treatment seeking" and included them in an expanded analytic sample, the primary results presented here. We compared the multivariable models for the limited and expanded analytic samples to examine the effect of our assumption.

Results

Of the 3302 women enrolled in the Study of Women's Health Across the Nation longitudinal cohort, 2234 (68%) reported monthly or more UI at any visit between baseline and year 9. Of these women who reported UI, a total of 1520 (68%) reported seeking UI treatment, most between baseline and year 9 (Figure 1). Compared to the 2251 women who remained in the Study of Women's Health Across the Nation through year 9, women who dropped out of the study or had missing data were more likely to be white with lower annual income and education at baseline, have a higher BMI, and either had no medical insurance or had public insurance. They were also more likely to report daily UI of urge or mixed type with a higher level of bothersomeness (data not shown).

The characteristics of incontinent women who did and did not seek UI treatment are shown in Table 1. Longitudinal characteristics of UI associated with seeking treatment in bivariate analyses were a longer duration of UI and more years reporting daily UI (Table 2).

In multivariable analyses, women had higher odds of seeking treatment when they reported experiencing symptoms for more than 7 years, when UI worsened over time, when UI was at least daily and bothersome just before seeking treatment. Importantly, women who saw physicians regularly or had more visits for preventive women's health care were also more likely to discuss their UI with a health care provider. When stratifying our models by race or

ethnicity (Table 3), by level of difficulty paying for basics and by education level (data not shown), we found few unique factors associated with seeking treatment. Likewise, in our primary multivariable models, interactions between UI frequency ($p = 0.77$) and duration ($p = 0.94$) and race or ethnicity as well as UI frequency ($p = 0.60$) and duration ($p = 0.31$) and difficulty paying for basics were not statistically significant. However, our power for detecting interactions between these variables, was low (0.40 with $\alpha = 0.05$).

For our secondary analysis of incontinent women who had not sought treatment for their UI before year 7, overall, about 12% reported seeking UI treatment between visits 7 and 9 (about 6% per year). As with our primary analysis, we found that frequency of UI in the year prior to seeking treatment and longer duration of UI had the strongest association with UI treatment-seeking. Among this smaller subset of women, we found no differences in the rates of seeking treatment by racial or ethnic group (data not shown).

The 364 incontinent women who did not answer the treatment-seeking questions because they answered “no” to the stem question “Have you ever leaked urine, even a small amount?” and for whom we imputed “no treatment seeking” in our expanded analytic sample differed from those for whom we had complete data. They were more likely to be black or Asian, not born in the US, and have a lower education level and annual household income. More than 50% of these 364 women had reported UI at least twice during the previous years; however, they were less likely to report daily UI, less likely to report mixed UI symptoms, and had a lower level of UI bothersomeness. When we compared our multivariable models of the expanded analytic sample to those in the limited analytic sample, we found few differences. Black women were statistically more likely than white women to seek treatment in our limited analytic sample (OR 1.59, 95% CI 1.18, 2.16), than in our expanded sample (aOR 1.25, 95% CI 0.77, 2.04). Frequent UI in the year prior to seeking treatment was strongly associated with seeking treatment in our expanded analytic sample, but not in our limited analytic sample. Otherwise, point estimates for all other variables were similar.

Discussion

In this 9-year, longitudinal study of midlife women, we found no clear or consistent evidence of racial, educational or socioeconomic disparities in seeking treatment for UI. Rather, longitudinal characteristics of UI had the strongest association with UI treatment-seeking behavior. In cross-sectional studies, women with more frequent and bothersome UI symptoms were more likely to seek care^{14,23,24}. Over time, we found that worsening symptoms, longer duration of symptoms, and persistent symptoms of daily UI were associated with women seeking UI treatment.

We found that women with more health care contact were more likely to report seeking treatment for their UI¹⁴. Women who seek care for other health concerns may be more likely to seek care for UI, or more health care visits may provide more opportunity to discuss UI. Higher health care use may also represent a closer doctor-patient relationship. Of particular importance to gynecologists, the results of our study suggest that regular women's

preventive health visits have the benefit of increasing the opportunity for incontinent women to discuss their UI.

Our study results do not support previous findings that black women or women with lower socioeconomic circumstances are either less likely to seek care or seek care only at a higher level of bother or UI frequency than white women or women of higher socioeconomic resources²⁵. Some of the intriguing findings in our bivariate analyses, such as experience of discrimination, higher importance of spirituality, anxiety symptoms, and greater social support, which may be related to race or ethnicity, socioeconomic status, or education level did not persist after adjustment in multivariable models but warrant further investigation.

The Study of Women's Health Across the Nation has collected a rich variety data that allowed a multi-layered exploration of changes in UI characteristics and UI treatment-seeking in a diverse community-based sample of women over 9 years. However, our study had some important limitations. While our UI questions were very similar to those in validated questionnaires^{26,27}, such instruments were not available at the initiation of the Study of Women's Health Across the Nation. Women with UI were more likely to drop out of our study. Race or ethnicity, income and education play a role in longitudinal cohort retention; white women with lower income and education were more likely to drop out of the Study of Women's Health Across the Nation. These factors may also have affected questionnaire responses as more black, Asian, and immigrant women with lower incomes and education did not respond to our treatment-seeking questions due to inconsistent UI reporting. Hispanic women could not be included in this analysis. The women who participated in the Study of Women's Health Across the Nation over 9 years represent those who actively engage in regular study visits and thus may be more likely to engage the medical system. Only 5% of our cohort reported not having health insurance, half the national average for this age group and time frame²⁸ and thus our cohort had ready access to care. For all these reasons, our study participants were probably more likely to seek care than the general population. Some of our analyses were limited by small numbers. For some of our analyses, we did not know exactly when in the intervening period between baseline and visit 7 a woman sought UI treatment; patterns of UI (such as worsening or no change in UI) may have crossed over the point of UI treatment seeking, rather than clearly preceded it. However, our analysis of longitudinal UI characteristics in women who sought care for the first time after visit 7 yielded similar results, suggesting minimal effect of this uncertainty.

The results of our investigation are important for research, public health outreach, and the clinical care of women. Our findings demonstrate some important problems in UI epidemiologic research. We demonstrated higher rates of inconsistent UI reporting among black, Asian and immigrant women on our questionnaires, suggesting differences in either meaning given to their UI problem or problems in interpretation of the questionnaire. Consideration should be given to developing instruments for assessing and validating change in UI over time in diverse populations. For public health educators, messages that encourage women to seek care for worsening or a longer duration of UI may be important for encouraging women to seek care. Clinicians should be more vigilant questioning infrequent health care system users about this common condition that may be affecting quality of life. While women may not report their UI problem at its onset, clinicians can use

preventive women's health visits to educate patients about returning for worsening of UI symptoms, thus establishing a relationship that encourages seeking treatment for UI at future health care visits.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Financial Support and Acknowledgements

Supported by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and NIH Office of Research on Women's Health (ORWH) Grant: DK092864. The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health (NIH), DHHS, through the National Institute on Aging (NIA), the National Institute of Nursing Research (NINR) and the NIH Office of Research on Women's Health (ORWH) (Grants U01NR004061; U01AG012505, U01AG012535, U01AG012531, U01AG012539, U01AG012546, U01AG012553, U01AG012554, U01AG012495).

The authors thank the study staff at each site and all the women who participated in SWAN.

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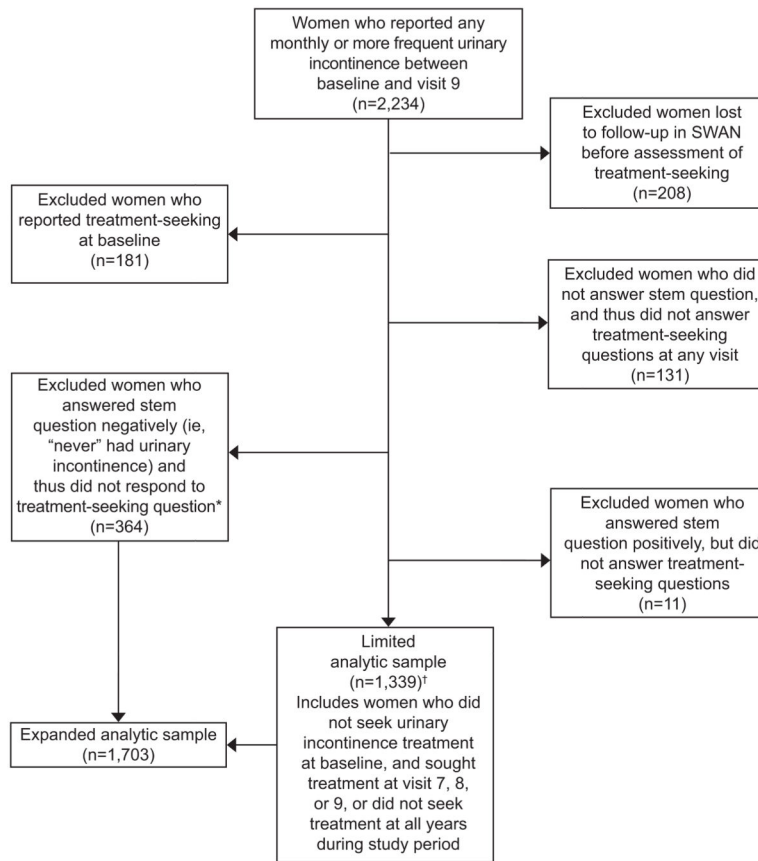


Figure 1.

Study flowchart. *Expanded analytic sample includes the incontinent women who answered the treatment-seeking questions in visits 7, 8, or 9 and the 364 women who reported urinary incontinence in previous visits, but reported “never” having had urinary incontinence to stem questions in visits 7, 8, and 9, and thus did not respond to treatment-seeking questions. In our analyses of this expanded analytic sample, we presumed these 364 women did not seek treatment because at the time of those questions, they did not recall having reported urinary incontinence in the past. †Limited analytic sample includes 113 women who were censored in visits 7 and 8 for nonresponse after these years or loss to follow-up. SWAN, Study of Women’s Health Across the Nation.

Table 1

Baseline Characteristics of Incontinent Women, by Report of Seeking or Not Seeking Treatment for Urinary Incontinence in Visits 7, 8, and 9

	Sought Treatment (N = 525)	Did Not Seek Treatment (N = 1178)	p-value
	Number or Mean Percent (%) or Standard deviation (SD)	Number or Mean Percent (%) or Standard deviation (SD)	
Race/ethnicity			<0.001
White *	282 (32.3)	592 (67.7)	
Black	173 (34.4%)	330 (65.6)	
Asian	70 (21.5)	256 (78.5)	
Born in U.S.			< 0.001
Yes	448 (32.5)	929 (67.5)	
No	47 (19.7)	192 (80.3)	
Difficulty paying for basics (baseline)			0.09
Not hard	326 (29.4)	783 (70.6)	
Somewhat hard	153 (32.4)	319 (67.6)	
Very hard	45 (38.4)	72 (61.5)	
Annual Household Income **			0.12
\$35K and above	374 (30.2)	864 (69.8)	
Below \$35K	141 (33.9)	275 (66.1)	
Education Level (baseline)			0.82
High School or Less	93 (31.1)	955 (69.0)	
Some college or greater	430 (30.4)	213 (69.6)	
Marital status (baseline)			0.03
Single	74 (31.4)	162 (68.6)	
Married or living as married	328 (29.0)	805 (71.1)	
Divorced/separated/widowed	116 (36.5)	202 (63.5)	
BMI (mean at baseline)	29.4 (7.8)	27.8 (7.3)	<0.001
Parity			0.06
Nulliparous	77 (26.2)	217 (73.8)	
Parous	447 (31.8)	960 (68.2)	
Medical (baseline)			
Diabetes	27 (32.5)	56 (67.5)	0.71
Hypertension	129 (37.6)	212 (62.2)	0.001
Medical insurance			0.49
Private	474 (30.6)	1074 (69.4)	
Public (Medicare, Medicaid, Military)	27 (37.0)	46 (63.0)	
None	24 (29.3)	58 (70.7)	
Baseline number of doctor's visits (mean)	4.3 (6.4)	3.3 (5.0)	0.001
Baseline women health visits			<0.001

	Sought Treatment (N = 525)	Did Not Seek Treatment (N = 1178)	p-value
	Number or Mean Percent (%) or Standard deviation (SD)	Number or Mean Percent (%) or Standard deviation (SD)	
Visit in the last year	407 (33.9)	795 (66.1)	
Visit in the last 2 years	75 (26.8)	205 (73.2)	
Visit in the last 3+ years	41 (19.6)	168 (80.4)	
Depressive symptom score (0–60, mean)	10.2 (9.4)	10.2 (9.2)	0.99
Anxiety symptoms score (0–16, mean)	2.7 (2.5)	2.4 (2.2)	0.02
Importance of religion/spirituality			0.04
None	43 (24.0)	136 (76.0)	
A little	143 (28.7)	355 (71.3)	
A great deal	339 (33.1)	684 (66.9)	
Experience of discrimination			0.002
Sometimes/often any blatant	156 (37.8)	257 (62.2)	
Sometimes/often any subtle	145 (29.3)	350 (70.7)	
No significant mistreatment	224 (28.2)	571 (71.8)	
Reason for discrimination			< 0.001
Race/ethnicity	90 (35.9)	161 (64.1)	
Gender	26 (23.9)	83 (76.2)	
Physical appearance	43 (44.3)	54 (55.7)	
Other reasons	125 (33.4)	249 (66.6)	
No reason given	241 (27.7)	630 (72.3)	
Number of people in household (mean)	2.1 (1.6)	2.3 (1.6)	0.04
SF-36 [®] physical score (0–100, mean)	69.7 (38.2)	76.5 (35.1)	<0.001
SF-36 [®] vitality score (0–100, mean)	53.9 (20.4)	55.3 (19.7)	0.18
SF-36 [®] social function score (0–100, mean)	78.2 (23.1)	82.2 (20.3)	< 0.001
SF-36 [®] emotional score (0–100, mean)	74.5 (36.1)	78.2 (34.1)	0.05
Age (years) at first report of UI			0.002
Less than 47	273 (34.6)	515 (65.4)	
47 or greater	252 (27.5)	663 (72.5)	
Menopausal status at first report of UI			< 0.001
Pre- or Early peri-menopause	482 (33.1)	974 (66.9)	
Late peri- or Postmenopause	21 (13.4)	136 (86.6)	
Frequency of UI at first report			< 0.001
Daily	55 (58.5)	39 (41.5)	
Weekly	101 (43.2)	133 (56.8)	
Monthly	369 (26.8)	1006 (73.2)	
Type of UI at first report			0.001
Stress	250 (29.1)	608 (70.9)	
Urge	112 (29.2)	272 (70.8)	

	Sought Treatment (N = 525)	Did Not Seek Treatment (N = 1178)	p-value
	Number or Mean Percent (%) or Standard deviation (SD)	Number or Mean Percent (%) or Standard deviation (SD)	
Mixed	154 (39.1)	240 (60.9)	
Bothersomeness of UI (0–10, mean) ^{‡‡}	4.5 (2.8)	3.2 (2.8)	< 0.001

All values are from baseline unless otherwise indicated. P-values are from chi-square test and t-test.

* White refers to white, non-Hispanic,

** Based on US median household income in 1995 of \$33K

[‡] Short Form (36) Health Survey

^{‡‡} Bothersomeness of UI was not asked in years 4,5,6, women whose first report of UI in 4,5,6 were excluded.

Missing data: For continuous variables, N = 63. For categorical variables: N represented by numbers in table

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Table 2

Longitudinal Urinary Incontinence Characteristics of Incontinent Women by Report of Seeking or Not Seeking Treatment in Years 7, 8, and 9 in Extended Analytical Sample

	Sought Treatment (N=525)	Did Not Seek Treatment* (N=1178)	p-value [§]
	N or Mean Percent (%) or Standard deviation (SD)	N or Mean Percent (%) or Standard deviation (SD)	
Duration of UI			< 0.001
UI present at baseline	373 (40.1)	557 (59.9)	
Developed UI after baseline	152 (19.7)	621 (80.3)	
Mean person-years of UI frequency prior to seeking/not seeking treatment			
Daily	0.9 (1.7)	0.3 (1.1)	< 0.001
Weekly	1.6 (1.8)	1.0 (1.7)	< 0.001
Monthly	3.4 (2.3)	4.3 (2.7)	< 0.001
Frequency of UI in year prior to seeking/not seeking treatment			< 0.001
Daily	79 (65.3)	42 (34.7)	
Weekly	120 (46.9)	136 (53.1)	
Monthly	244 (31.9)	522 (68.1)	
Change in frequency prior to seeking/not seeking treatment**			0.13
UI worsened	228 (36.8)	391 (63.2)	
UI unchanged with high variance	195 (26.5)	540 (73.5)	
UI unchanged with low variance	25 (39.1)	39 (60.9)	
UI improved	77 (27.0)	208 (73.0)	
Mean person-years of UI type prior to seeking/not seeking treatment			
Stress only	2.9 (2.9)	3.6 (3.5)	< 0.001
Urge only	1.4 (2.3)	1.8 (2.7)	0.007
Mixed	2.5 (2.6)	1.9 (2.6)	< 0.001
Type of UI in year prior to seeking/not seeking treatment			< 0.001
Stress only	203 (27.6)	533 (72.4)	
Urge only	112 (27.9)	289 (72.1)	
Mixed	208 (38.0)	340 (62.0)	
Change in UI type over years prior to seeking/not seeking treatment***			0.12
Only stress	79 (38.5)	126 (61.5)	
Only urge	25 (32.9)	51 (67.1)	
Stress -> Mixed	169 (26.0)	482 (74.0)	
Urge -> Mixed	87 (28.2)	221 (71.8)	
Mixed or all other combinations	163 (35.4)	298 (64.6)	

* For women who did not report seeking treatment for UI through Year 9, calculations of mean person years are included through Year 9. Similarly, Year 8 values are used for frequency and type of UI in the “year prior” to not seeking treatment as Year 9 is the last documented time point for this observation.

§ Tests used for p-values are Chi-square test and t-test.

** Change in UI was calculated as follows. Reports of an increase in UI frequency between categories were assigned a value of +1, reports of no change were assigned a 0, and reports of a decrease in UI frequency between categories was assigned a value of -1. These were summed to define: Worsening – overall score of >0 (N = 619) Improving – overall score of <0 (N = 285)

No change with high variance = 0, but with many changes in frequency over years of reporting UI (N = 735)

No change with low variance = 0, but with few changes in frequency over years of reporting UI (N = 64)

*** Definitions of change until each report of seeking treatment versus not seeking treatment.

Only stress at all visits prior (N = 205) Only urge at all visits prior (N = 76)

Stress -> Mixed – reports stress UI only at first or more visits, then reports both stress and urge (N = 651)

Urge -> Mixed – reports urge UI only at first or more visits, then reports both stress and urge (N = 308)

Mixed or other combinations – reports mixed at every visit, following none of above patterns (N = 461)

Missing data: N = 18

Table 3

Adjusted Odds Ratios for Factors Associated with Seeking Treatment for Urinary Incontinence in Visits 7, 8, or 9

	All racial groups aOR (95% CI)	White aOR (95% CI)	Black aOR (95% CI)	Asian aOR (95% C)
Race				
White *	Reference			
Black	1.25 (0.77, 2.04)			
Asian	0.74 (0.42, 1.33)			
Difficulty paying for basics				
Not hard at all	Reference	Reference	Reference	Reference
Somewhat hard	1.29 (0.80, 2.08)	1.14 (0.57, 2.28)	1.77 (0.77, 4.07)	0.88 (0.23, 3.36)
Very hard	1.47 (0.61, 3.52)	1.10 (0.26, 4.54)	1.93 (0.56, 6.65)	1.61 (0.08, 31.5)
Education Level (baseline)				
High School or Less	Reference	Reference	Reference	Reference
Some college or greater	1.07 (0.61, 1.87)	0.90 (0.38, 2.16)	1.17 (0.49, 2.80)	1.42 (0.30, 6.73)
Parity				
Nulliparous	Reference	Reference	Reference	Reference
Parous	1.43 (0.80, 2.54)	1.61 (0.79, 3.30)	1.34 (0.37, 4.88)	0.88 (0.19, 4.18)
Number of years with anxiety	1.01 (0.92, 1.10)	1.07 (0.79, 1.22)	0.96 (0.82, 1.12)	0.96 (0.75, 1.24)
SF-36 vitality score	1.01 (1.00, 1.02)	1.02 (1.01, 1.03)	1.01 (0.99, 1.03)	0.99 (0.97, 1.02)
Number women's health visits	1.18 (1.07, 1.30)	1.20 (1.04, 1.38)	1.12 (0.94, 1.34)	1.30 (0.99, 1.72)
Average number MD visits	1.07 (1.02, 1.12)	1.07 (1.00, 1.14)	1.09 (0.99, 1.20)	1.04 (0.92, 1.18)
Diabetes				
No	Reference	Reference	Reference	Reference
Yes	0.63 (0.24, 1.64)	0.94 (0.18, 5.03)	0.51 (0.13, 1.99)	0.58 (0.05, 7.02)
Frequency of UI at first report				
Monthly	Reference	Reference	Reference	Reference
Weekly	1.71 (0.91, 3.19)	1.85 (0.75, 4.55)	1.22 (0.40, 3.67)	2.26 (0.45, 11.4)
Daily	2.38 (0.89, 6.36)	3.43 (0.79, 14.8)	1.50 (0.31, 7.15)	3.49 (0.21, 57.30)
Frequency of UI in year prior to report				
None	Reference	Reference	Reference	Reference
Monthly	1.75 (0.98, 3.15)	1.66 (0.67, 4.12)	1.75 (0.67, 4.56)	2.08 (0.47, 9.24)
Weekly	2.17 (0.99, 4.76)	2.20 (0.67, 7.24)	1.93 (0.54, 6.94)	2.89 (0.32, 26.4)
Daily	3.16 (1.15, 8.67)	3.67 (0.83, 16.3)	2.57(0.51, 12.90)	1.66 (0.05, 52.20)
Duration of UI				
Present at baseline (> 7 yrs)	Reference	Reference	Reference	Reference
Less than 4 years	0.41 (0.15, 1.08)	0.39 (0.10, 1.53)	0.50 (0.10, 2.53)	0.15 (0.01, 6.72)
4–7 years	0.37 (0.21, 0.65)	0.31 (0.13, 0.72)	0.38 (0.15, 1.01)	0.58 (0.13, 2.64)
UI improve in year prior	0.62 (0.32, 1.19)	0.54 (0.22, 1.35)	0.85 (0.26, 2.83)	0.51 (0.10, 2.64)

	All racial groups aOR (95% CI)	White aOR (95% CI)	Black aOR (95% CI)	Asian aOR (95% C)
UI worse in year prior	1.75 (1.01, 3.04)	1.90 (0.87, 4.13)	1.94 (0.75, 4.99)	1.19 (0.26, 5.56)
Bothersomeness of UI	1.09 (1.01, 1.18)	1.10 (0.98, 1.23)	1.12 (0.98, 1.29)	1.05 (0.85, 1.28)

* White refers to white, non-Hispanic, aOR = adjusted Odds Ratio, CI = Confidence Interval

CI's in this model represent correction for 78 comparisons: alpha = 0.05/78 or p = 0.0064

Bolded values represent those results that are statistically significant

All values from baseline unless otherwise indicated. All variables in model are represented in the table.

Independent variables selected by stepwise selection using 0.3 as entry criteria and 0.2 as stay criteria.

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