Bladder Symptoms in the Early Menopausal Transition

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Abstract

Purpose: Bladder symptoms are common in women and result in use of healthcare resources and poor quality of life. Bladder symptoms have been linked to age and menopause, but debate exists in the literature. This article examines factors associated with bladder symptoms and compares women in late reproductive stage with those in menopausal transition.

Materials and Methods: We analyzed cross-sectional data from a prospective cohort study of midlife women (mean age, 48; range, 44–54 years) in northern California. The sample consisted of 158 women in late reproductive stage or menopause transition. Assessments included anthropometrics, menstrual cycle lengths and symptoms, urine samples for follicle-stimulating hormone level, and self-reported health perception and depressive symptoms. Analyses included descriptive bivariate statistics, group comparisons, and regression models.

Results: The most common bladder symptoms were nocturia (72%) at least once per night and urinary incontinence (50%) at least once per week. Incontinence was less prevalent in African American women compared to European Americans and Latinas ($p=0.001$) and more prevalent in late reproductive stage than in menopause transition ($p=0.024$). Controlling for age, women in late reproductive stage were more likely to report nocturia compared to those in menopause transition. Reproductive stage ($p=0.016$), higher body mass index ($p=0.007$), and race ($p=0.017$) contributed to the variance in weekly nighttime urinary frequency.

Conclusion: Bladder symptoms were associated with reproductive stage. Women in late reproductive stage were more likely to experience nocturia and incontinence than those in menopause transition. The higher rates of nocturia and incontinence in late reproductive stage are intriguing. Future studies should include analysis of pelvic organ prolapse degree and other structural differences.

Introduction

MORE THAN HALF OF WOMEN will experience bladder symptoms at some time over the course of their lives, and bladder problems are common for women regardless of age or menopause status.^{1,2} Bladder symptoms, such as incontinence, urgency, or frequency, are commonly associated with a lower quality of life and increased use of healthcare resources.^{3–7} Bladder symptoms may be due to age-related autonomic denervation, decreased bladder muscle tone, or increased bladder muscle fatigue.⁸ Parity and medical conditions, such as diabetes, obesity, and depression, are associated with prevalence and incidence of bladder symptoms.^{9–14} Racial and gender differences in bladder symptoms, specifically symptoms of overactive bladder, such as incontinence or urgency, have also been reported.^{4,11,15}

The menopause transition is also associated with increased urinary complaints linked to the drastic reduction in endogenous estrogens, yet the literature remains unclear as to whether it is aging or reproductive stage that has the greater influence on bladder symptoms.^{1,8,16–18} Many of these influencing factors are interrelated and may depend on inherent personal characteristics, health conditions, or lifestyle situations. Therefore, the purpose of this article was to describe factors associated with bladder symptoms in late reproductive stage and menopausal transition for a sample of women of similar age. Data from a San Francisco cohort of midlife women were used to describe the experience of bladder symptoms by age, reproductive stage, and ethnicity.

Based on the Symptom Management Theory (SMT), we hypothesized that age, reproductive stage, race/ethnicity, and childbirth history would help explain the experience of

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bladder symptoms for midlife women. Symptom experience is central to this theory, which also recognizes the importance of person and environment in approaching any treatment or management of symptoms.^{19,20} When evaluating symptoms, SMT proposes considering multiple personal and clinical factors with the goal of developing effective tailored interventions and improving health outcomes.

Materials and Methods

Design and participants

This analysis was conducted within a cohort study of midlife women in the San Francisco Bay Area who participated in the University of California San Francisco (UCSF) Women's Health Study. Eligible participants of the UCSF Women's Health Study were community-dwelling women between 40 and 50 years of age who reported still experiencing regular menstrual periods and denied using hormone replacement therapy in the past 12 months. Women who self-identified as having major health problems or who were taking hormone therapy at initiation of the study were excluded.²¹ Assessments of bladder symptoms were added to the last 2 years of the study (Phase 2; years 6–7). Assessments occurred every 6 months until postmenopause (through 1 year posthysterectomy, 1 year postinitiating hormone therapy, or 1 year after the last menstrual period).²²

At baseline, Phase 1, there were 347 women in the study. This Phase 2 substudy is focused on the 158 participants who remained in either late reproductive stage or menopausal transition in Phase 2, when bladder symptoms were added to the questionnaires. Details of recruitment and protocol for Phase 1 were previously reported.^{21,22} The UCSF Committee on Human Research approved the study, and all participants provided informed consent before data collection.

Measures

Bladder symptoms, such as daytime and nighttime urinary frequencies, urinary incontinence, and urinary tract infections (UTIs), were assessed using self-report questionnaire measures adapted from other epidemiologic women's health studies focusing on urinary tract function.^{23–27} Classifications for urinary incontinence and nocturia are consistent with the definitions developed by the International Continence Society.²⁸ UTI was assessed using the question, "How many times have you been told that you had a urinary tract infection in the past 6 months?" Daytime and nighttime urinary frequencies were assessed by asking women to think about the past week and report the number of times during the day and the number of times during the night that they urinated on average during the past week. Nighttime frequency was then dichotomized as either no nocturia (0) or having nocturia (1) at least once per night on average in the past week.²⁸

Urinary incontinence was assessed by asking the women if they had leaked even a small amount of urine during the past 6 months. Their response options included (1) none, (2) less than once per month, (3) one or more times per month, (4) one or more times per week, and (5) every day. They were then asked if they had leaked urine in the past 7 days, and if so, how many times it was related to an activity (coughing, sneezing, laughing, lifting, *etc.*) and how many times it was related to sudden urge. Women were considered to have

clinically significant urinary incontinence if they reported leakage occurring at least once per week on average, and this variable was dichotomized (0 = less than once per week and 1 = at least once per week or daily).

Other participant characteristics included self-reported age; race/ethnicity as African American, Latina, or European American; education (ranging less than high school equivalent to college graduate); income (ranging less than \$31,000 to more than \$81,000); perceived health status (rated from 1 = excellent to 5 = poor), and parity (number of live births). Current use of diuretic medications was assessed with a yes or no response.

As part of the study, women provided a urine sample for assaying follicle-stimulating hormone (FSH), measurement of weight and height to calculate body mass index (BMI), and measurement of waist and hip circumferences to determine waist-to-hip ratio. Reproductive stage was coded as either "late reproductive stage" or "menopause transition" using a combination of menstrual regularity and FSH trends based on the Stages of Reproductive Aging Workshop (STRAW) criteria that provide a comprehensive characterization of hormonal and physiological changes associated with menopause to standardize clinical and research nomenclature.²⁹

Depressive symptoms were assessed using the 20-item Center for Epidemiologic Studies Depression (CES-D) Scale that asks participants to self-rate 20 symptoms on frequency of occurrence from 0 (not during the past week) to 3 (5–7 days in the past week). Scores range from 0 to 60, and a score of 16 or higher indicates risk for clinical depression and need for clinical follow-up.³⁰ The items were internally consistent in this sample (Cronbach α coefficient = 0.92).

Statistical analyses

Descriptive statistics were used to compare demographic and bladder characteristics by race/ethnicity and reproductive stage. Pearson correlation coefficients (r) or Spearman's ρ was used to examine relationships between continuous variables; chi square was used to evaluate categorical associations. Independent t -tests and analysis of variance (ANOVA) were conducted to evaluate mean differences in characteristics between racial/ethnic and reproductive stage groups to better understand their bladder symptom experience. A logistic regression model was used to evaluate independent associations between participant characteristics and nocturia, focusing on characteristics reported in the literature to have the potential to influence bladder symptoms: age, race/ethnicity, income, stage of reproduction, BMI, depressive symptoms, parity, diuretic usage, urinary incontinence, major illness, and perceived general health status. A logistic regression was also used to evaluate the impact of the same variables on experience of incontinence. All analyses were performed using SPSS version 22.0 software.

Results

Demographic and clinical characteristics

The mean ($\pm$ SD) age of the 158 participants was 48.1 ± 2.2 years; 72 were in late reproductive stage (STRAW stage –3a or –3b) and 86 were in menopause transition (STRAW stage –2 or –1). These two groups differed in age ($t = 2.98$, $p = 0.003$), with the menopause transition group (48.5 ± 2.0

TABLE 1. DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

<i>Participant characteristics</i>	<i>African American, n = 46</i>	<i>Latina, n = 41</i>	<i>European American, n = 71</i>	<i>Total sample, n = 158</i>
Age (years)	48 ± 2.2	48 ± 2.6	48 ± 1.9	48 ± 2.2
FSH (IU/DL)	3.27 ± 5.01	1.38 ± 1.98	1.33 ± 1.75	1.75 ± 2.87*
BMI (kg/m ²)	30.5 ± 7.49	28.9 ± 5.89	27.1 ± 6.06	28.4 ± 6.43*
CES-D depressive symptoms (0–60)	10.9 ± 10.50	9.3 ± 9.66	11.6 ± 9.15	10.8 ± 9.92
Reproductive status				
Late reproductive stage	16 (34.8)	21 (51.2)	35 (49.3)	72 (45.6)
Menopause transition	30 (65.2)	20 (48.8)	36 (50.7)	86 (54.4)
Parity				
0 live births	16 (32)	14 (27)	30 (41)	60 (35)*
1–2 live births	25 (57)	15 (40)	31 (45)	71 (47)
≥3 live births	5 (11)	12 (33)	10 (14)	27 (18)
Education				
Less than high school	2 (4.4)	4 (9.7)	0	6 (3.8)*
High school or GED	1 (2.1)	6 (14.6)	0	7 (4.4)
Some college	19 (41.3)	13 (31.7)	12 (16.9)	44 (27.8)
College graduate	24 (52.2)	18 (43.9)	59 (83.1)	101 (64.0)
Marital status				
Married	17 (37.0)	21 (51.2)	42 (59.1)	80 (50.6)*
Living with partner	4 (8.7)	4 (9.8)	14 (19.7)	22 (14.0)
Single/divorced	24 (52.1)	15 (36.6)	14 (19.8)	53 (33.5)
Widowed	1 (2.2)	1 (2.4)	1 (1.4)	3 (1.9)
Income				
<\$30,999	8 (18.7)	10 (25.0)	2 (2.8)	20 (13.0)*
\$31,000–\$50,999	7 (16.3)	10 (25.0)	10 (14.0)	27 (17.5)
\$51,000–\$80,999	13 (30.2)	10 (25.0)	13 (18.2)	36 (23.4)
>\$81,000	15 (34.9)	10 (25.0)	46 (64.8)	71 (46.1)
	3 missing	1 missing		
Perceives general health as	21 (45.7)	24 (58.5)	47 (69.1)	92 (59.0)*
“excellent” (1) or “very good” (2)				
Major health problem in the past year	11 (23.9)	15 (21.1)	11 (26.8)	37 (23.4)
Take a diuretic	8 (17.4)	0	2 (2.8)	10 (6.3)*

N (%) or mean ± standard deviation.

*Three groups differed significantly ($F_{[2, 157]} > 3.0$, $p < 0.05$).

BMI, body mass index; CES-D, Center for Epidemiologic Studies Depression; FSH, follicle-stimulating hormone.

years) 1 year older than the late reproductive stage group (47.5 ± 2.3 years). More than 60% of the women evaluated their health as “very good” or “excellent” in general. As seen in Table 1, only 6% ($n = 10$) reported taking a diuretic, and the rate was significantly higher in African American women ($\chi^2 = 13.7$, $p = 0.001$). As seen in Table 2, only 8% reported having had a UTI in the past 6 months, and there was no significant difference by reproductive stage or race/ethnicity.

Bladder symptoms by race/ethnicity and other sociodemographic characteristics

The most prevalent bladder symptom (73.2%) for participants in this sample was nocturia reported at least once per night during the past week. Frequency of nocturia was associated with BMI ($\rho = 0.293$, $p < 0.001$) and diuretic use ($\rho = 0.166$, $p = 0.039$). There was no race/ethnic difference in the prevalence of nocturia (Table 2). Only 42 (26.8%) women reported no nocturia in the past week. These 42 women without nocturia ranged from 44 to 52 years of age, and most (28; 67%) were in menopausal transition stage.

Urinary incontinence was the second most common bladder symptom; only 28.5% of the sample reported no experi-

ence with incontinence in the past 6 months. Almost half (49.4%) reported that they experienced incontinence in the past week (Table 2). Urinary incontinence was unrelated to age, BMI, parity, depressive symptoms, or diuretic use. This bladder symptom was significantly associated with race/ethnicity ($\chi^2 = 12.87$, $p = 0.001$). Despite more use of diuretics and a higher BMI, only 27% of African American women reported incontinence compared to 61% of European Americans and 56% of Latinas. Of the 78 participants who reported urinary incontinence, 33 (42%) reported urgency incontinence and 59 (76%) reported leakage related to activity (stress incontinence).

Bladder symptoms by reproductive stage

Nocturia, UTI, and use of diuretics were not significantly associated with reproductive stage. Women in menopausal transition had a higher BMI (29.5 ± 7.17) compared to those who were in late reproductive stage (28.2 ± 7.45). Reproductive stage was associated with urinary frequency; women in late reproductive stage reported a higher daytime frequency than those in menopausal transition ($t = 2.61$, $p = 0.010$), but the difference in nighttime frequency did not reach statistical significance ($t = 1.69$, $p = 0.093$). Women in

TABLE 2. BLADDER SYMPTOMS BY RACE/ETHNICITY

	African American, n = 46	Latina, n = 41	European American, n = 71	Total sample, N = 158
Participant characteristics	N (%)	N (%)	N (%)	N (%)
UTI past 6 months	2 (4.5)	6 (16.2)	5 (7.2)	13 (8.2)
Incontinence frequency past 6 months				
None	22 (48)	12 (29)	11 (15)	45 (28.5)
About once per month	16 (35)	17 (42)	36 (51)	69 (43.7)
About once per week	6 (13)	9 (22)	19 (27)	34 (21.5)
Every day	2 (4)	3 (7)	5 (7)	10 (6.3)
Incontinence last week (yes)	12 (26)	23 (56)	43 (61)	78 (49)*
Nocturia (yes)	38 (83)	29 (70)	48 (69)	115 (73)
Urinary frequency	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Daytime (number/day)	5.10 $\pm$ 1.95	5.66 $\pm$ 1.86	6.54 $\pm$ 2.11	5.86 $\pm$ 2.03*
Nighttime (number/night)	1.26 $\pm$ 0.98	1.07 $\pm$ 1.13	1.04 $\pm$ 0.99	1.11 $\pm$ 1.03

*Three groups differed significantly ($F_{[2, 157]} > 5.0$, $p < 0.01$).
UTI, urinary tract infection.

late reproductive stage were also significantly more likely to report urinary incontinence ($t = 2.28$, $p = 0.024$), although differences between types of incontinence (urgency or stress) were not statistically significant given the small numbers for each type of incontinence (Table 3).

Regression analyses

Given the high prevalence of nocturia and urinary incontinence in this sample, logistic regression analyses were conducted to simultaneously examine potential factors that could account for each of these prominent bladder symptoms. Variables in both models included age, race/ethnicity, income, education, depressive symptoms, diuretic use, perceived general health status, major health problem in the past year,

number of live births, reproductive stage, and BMI. As seen in Table 4, the model for experiencing nocturia was significant ($\chi^2 = 29.86$, $p = 0.003$) with the following characteristics included: age, race/ethnicity, income, education, reproductive stage, diuretic use, parity, depressive symptoms, health status, BMI, and major health problem in the past year. Controlling for all other variables, BMI ($p = 0.007$), reproductive stage ($p = 0.016$), and race ($p = 0.017$) made significant contributions to the overall model. The model for experiencing urinary incontinence was not significant (Table 4).

Discussion

In describing the bladder symptom experience for this female cohort of midlife women, we were able to show that the two most prevalent bladder symptoms were nocturia and urinary incontinence. The regression analyses indicate that reproductive stage had more influence on these bladder symptoms than age, with a higher prevalence occurring in the late reproductive stage compared to the menopausal transition stage. On the surface, this appears to be in conflict with the literature that suggests women will continue to experience bladder symptoms in the postmenopause reproductive stage.^{2,8,25,31} However, participants in this study had not yet transitioned to postmenopause (Stage +1a). Therefore, it is possible that physiological changes associated with this inevitable transition could result in continued symptoms or the onset of new bladder symptoms. A recent study of older women (mean age, 56 years) found increased age, being African American or Latina, hysterectomy, and worse depressive symptoms to be associated with increased risk of nocturia.¹¹ In our cohort of midlife women, a participant was at higher risk for nocturia if she was African American, had a greater BMI, or was in late reproductive stage.

Although this sample of women was healthy when originally recruited, it is possible that developing medical conditions may have contributed to the bladder symptoms; however, developing a major health problem in the past year and general health perception were not significant predictors in the regression model. BMI was the most significant contributor to the experience of nocturia. This finding was not surprising as obesity and weight gain have been identified as

TABLE 3. BLADDER SYMPTOMS BY REPRODUCTIVE STAGE (N = 158)

	Late reproductive stage (n = 72)	Menopause transition (n = 86)
Bladder symptoms	N (%)	N (%)
UTI past 6 months (yes)	6 (8.5)	7 (8.3)
Incontinence frequency past 6 months		
None	12 (17)	33 (38)
About once/month	38 (53)	31 (36)
About once/week	17 (23)	17 (20)
Every day	5 (7)	5 (6)
Incontinence last week (yes)	43 (59.7)*	35 (40.7)
Stress incontinence	31	28
And/or urge incontinence	18	15
Nocturia (yes)	58 (81)	58 (67)
Urinary frequency	Mean $\pm$ SD	Mean $\pm$ SD
Daytime (number/day)	6.31 $\pm$ 2.17**	5.48 $\pm$ 1.84
Nighttime (number/night)	1.26 $\pm$ 1.03***	0.99 $\pm$ 1.01

Reproductive stage defined by Stages of Reproductive Aging Workshop (STRAW) criteria.²⁹

*Two groups differed significantly (Pearson $\chi^2 = 5.68$, $p = 0.017$).

**Two groups differed significantly ($t = 2.61$, $p = 0.010$).

***Two groups were not significantly different ($t = 1.69$, $p = 0.093$).

TABLE 4. LOGISTIC REGRESSION SUMMARY FOR EXPERIENCING NOCTURIA AND INCONTINENCE

Characteristics	Nocturia, N = 158			Incontinence, N = 158		
	Explained variance: $\chi^2 = 29.86$, $p = 0.003$			Explained variance: $\chi^2 = 9.535$, $p = 0.657$		
	β	p	Exp(B)	β	p	Exp(B)
Age	-0.131	0.263 (NS)	0.877	-0.117	0.252 (NS)	0.889
Race/ethnicity						
African American (1 = yes)	-1.945	0.017*	0.143	0.981	0.147 (NS)	2.667
European American (1 = yes)	-0.709	0.247 (NS)	0.492	-0.482	0.385 (NS)	0.618
Income	-0.019	0.128 (NS)	0.982	-0.015	0.148 (NS)	0.986
Education	0.016	0.942 (NS)	1.016	0.074	0.695 (NS)	1.077
Reproductive stage	1.272	0.016*	3.568	-0.170	0.694 (NS)	0.844
Diuretic use	0.973	0.393 (NS)	2.647	-0.183	0.853 (NS)	0.833
Number of live births	0.308	0.127 (NS)	1.360	-0.124	0.430 (NS)	0.883
CES-D (depressive symptoms)	-0.005	0.863 (NS)	0.995	-0.006	0.777 (NS)	0.994
Perceived general health status	-0.531	0.131 (NS)	0.588	0.085	0.755 (NS)	1.089
BMI (kg/m ²)	0.150	0.007*	1.162	0.027	0.381 (NS)	1.027
Major health problem past year	0.793	0.142 (NS)	2.211	-0.388	0.430 (NS)	0.678

NS, not statistically significant, $p > 0.10$.

*Statistically significant, $p < 0.05$.

risk factors in bladder symptom occurrence.^{8,32} In addition, BMI has also been shown to influence reproductive stage,^{33–35} and reproductive stage was a significant contributor in the regression model when also controlling for age, parity, diuretic use, race/ethnicity, and BMI.

Previous studies similar to ours have described risk factors, such as parity, ethnicity, BMI, reproductive status, and age, to be associated with bladder symptoms in pre- and postmenopausal women.^{27,36,37} A study of premenopausal women in the Seattle Midlife Women's Health Study found urge incontinence to be related to age, parity, and BMI, while stress incontinence was related to worse perceived health, parity, and being White.³⁶ Although our study did not find significant differences for urge versus stress incontinence, stress incontinence was more frequently reported, and women who were identified as European American (White) or who were still in late reproductive stage were more likely to report any type of incontinence.

Women in this sample ranged in age from 44 to 54 years, but age was not a significant factor for the experience of bladder symptoms. Women in the late reproductive stage were more likely to report urinary incontinence and nocturia compared to those who were in menopausal transition. After controlling for age, parity, BMI, and other relevant factors, the experience of incontinence was no longer associated with reproductive stage, and the experience of nocturia was associated with late reproductive stage rather than menopausal transition stage (Table 4). Our findings would suggest that when both age and reproductive stage are considered simultaneously, reproductive stage may be a greater factor in the occurrence of nocturia than chronological age.

Similarly, race/ethnicity was initially a factor in the experience of incontinence and nocturia (Table 2). However, after controlling for age, parity, BMI, and other relevant factors, the experience of incontinence was no longer associated with race/ethnicity, but being European American remained protective against nocturia (Table 4). The reasons for this finding are not completely clear; however, the African American women in this sample had a higher BMI and FSH level in comparison to European Americans and Latinas of

similar age. Race, BMI, and reproductive stage remained consistent in their influence on the experience of nocturia in this group of midlife women, and this has been reported by others.^{2,11,38} However, use of diuretics, parity, and depressive symptoms were consistent factors that did not influence bladder symptoms in this sample of women.

Although age was not a significant contributor to the experience of nocturia, there was a very narrow age range across this sample of women. The similarity in chronological age proved fortuitous as it allowed us to see that biological age (reproductive stage) was a greater factor than chronological age. Biological age is highly variable and can be influenced by multiple factors, such as genetics, health status, race, and environmental stressors.

The nonsignificant regression model for experience of incontinence is an interesting finding. Key variables are clearly lacking to gain a deeper understanding of incontinence in midlife women. Past research has shown incontinence to be greatly influenced by physiological factors and comorbid conditions, such as the degree of pelvic organ prolapse, and these factors were not fully explored in this study. Inclusion of such physiological factors could have provided a better understanding of relevant factors associated with incontinence. Fewer variables in the regression model may have allowed for more statistical power to detect significance with characteristics, such as race/ethnicity, reproductive stage, and BMI. Further research is needed on the experience of incontinence in midlife women.

Using SMT as a foundation for this analysis, we explored multiple salient factors associated with women's experience of the two most prevalent bladder symptoms: nocturia and incontinence. These factors should be considered in developing and testing interventions to manage bladder symptoms and improve quality of life for women in any reproductive stage. Symptom management strategies will be best determined by our ability to further deconstruct the bladder symptoms that are most bothersome for the individual woman and tailor appropriate interventions to their expected or desired outcomes.

Study limitations

Our study has limitations to consider that may influence the conclusions. Given the sample size and demographics of the sample, findings cannot be generalized to all midlife women. Demographic and health data were collected every 6 months over time (Phase 1, Times 1–7, and Phase 2, Times 8–11), but the bladder symptom questionnaire was included only in Phase 2. Data for this analysis were collected in Phase 2 after some participants were already postmenopausal and excluded after 12 consecutive months of amenorrhea, 12 months of hormone replacement therapy, or having had a hysterectomy. Thus, our results are limited to women in only late reproductive stage and menopausal transition between 44 and 54 years of age. Bladder symptom data over a longer time frame and in earlier reproductive stages could provide more insight into the onset and timing of bladder symptoms in conjunction with the onset and timing of menopause transition. Inclusion of physiological characteristics, such as the degree of prolapse or bladder pressure measurements, may also improve the regression model for incontinence in future studies.

Conclusions

Women are at risk of bladder symptoms due to natural aging and menopause, but when they are most at risk is yet to be determined. Bladder symptoms, such as nocturia and urinary incontinence, are associated with significant morbidity and lower quality of life. BMI, late reproductive stage, and being Latina or Caucasian were the most significant factors associated with the experience of nocturia in our sample of midlife women. We found no difference in bladder symptom reports by parity, health problems, or depressive symptoms. Further research is needed to determine why bladder symptoms were found to be more common in women of similar age in late reproductive stage rather than in menopausal transition and how race and age may impact the severity or progression of bladder symptoms.

While differences between pre- and postmenopausal symptoms have been more extensively researched, differences in specific bladder symptom experiences for late reproductive and menopausal transition stages are less clear, particularly for incontinence. Further research about differences in urinary symptom experience based on reproductive stage, body composition, structural differences, and race/ethnicity would enhance our understanding of this symptom experience and potentially decrease associated long-term morbidity and improve quality of life for all women across midlife.

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