



Compensatory bladder behaviors (“coping”) in women with overactive bladder

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ABSTRACT

Aims: There is little information on how often or within what contexts individuals with OAB use compensatory behaviors (“coping”) to manage symptoms. We sought to examine how frequently women with OAB report using coping behaviors and whether these are associated with psychosocial factors.

Methods: One hundred twenty adult women with OAB completed the OAB questionnaire (OAB-q), ICIQ-FLUTS questionnaire, PROMIS Anxiety and Depression, Perceived Stress Scale, patient perception of bladder condition, and demographic and clinical data. Responses from five items from the OAB-q Quality-of-Life scale asking about coping with OAB symptoms (i.e., “compensatory coping behaviors”) were summed to generate a total Coping Score. Linear regression was used to identify associations between individual coping behaviors, total Coping Scores, and exposure variables.

Results: Most (88%) subjects reported using at least one compensatory coping behavior at least “a little of the time,” with “locating the nearest restroom in a new place” the most frequent. Higher BMI, lower education, using OAB medication, and urgency incontinence as well as urinary symptom severity were all associated with higher coping scores. Beyond the influence of OAB severity, higher anxiety ($\beta = 0.15$, 95% CI [0.05–0.26], $p = 0.004$) and stress ($\beta = 0.16$ [0.03–0.25], $p = 0.02$) were significantly associated with higher total coping scores, although depression was not.

Conclusions: Compensatory bladder behaviors (coping) were common in women with OAB and were associated with greater urinary symptom severity and higher anxiety and stress. Further study is needed to understand how coping behaviors and psychosocial factors relate, as these may represent important opportunities for interventions.

KEYWORDS

anxiety, coping behavior, overactive bladder, psychological distress, psychosocial functioning, urinary urge incontinence

1 | INTRODUCTION

Nonneurogenic or idiopathic overactive bladder (OAB, i.e., urinary urgency, with or without urgency incontinence, frequency, or nocturia) affects one in seven US men and women and can have profound impacts on the quality of lives of affected individuals.¹ As examples, individuals with OAB can reduce physical activity, gain weight, decrease sexual activity, and limit social engagement in response to bladder symptoms.² Not surprisingly, the condition is associated with increased rates of stress, anxiety, and depression.³ Adaptation to chronic illness symptoms may be affected by psychological factors, such as how individuals appraise and respond to symptoms.² To help cope with symptoms and mitigate the impact of OAB on their lives, individuals often adopt compensatory behaviors and lifestyle strategies to try to manage their condition.^{2,4} A few studies have sought to identify these different coping strategies in OAB, which include, among others: using containment products (pads or diapers); strategizing (i.e., altering activities or plans to accommodate restroom needs, mapping restroom locations, etc.); restricting oral intake/fluids, and; toileting behaviors (e.g., “defensive” or convenience voiding without urge to prevent urgency episodes).^{2,4–7} It is unclear whether these strategies are effective, and some behaviors may inadvertently worsen symptoms and reduce the quality of life.

Within the framework of stress coping theory,⁸ compensatory coping behaviors can be problem-focused and aimed at managing the situational aspects of symptoms (e.g., restricting fluid to decrease voids or urgency episodes), or emotion-focused and seek to regulate the emotional consequences of the stressor (e.g., avoiding places where locations of restrooms are unknown to proactively avoid anxiety). When proactive, problem-focused coping is used, compensatory strategies can modify the situation and at times lessen the emotional toll accompanying symptoms.^{9,10} Greater reliance on emotion-focused coping strategies and avoidant or passive illness coping behavior result in a poorer adjustment to illness, however.^{9,11} As anxiety and anxiety avoidance often drive compensatory behaviors (i.e., use of compensatory behaviors is operantly reinforced by the resulting reductions in anxiety),¹² individuals with higher generalized anxiety hypothetically are more likely to report more frequent compensatory OAB behaviors. However, there is little information on how often or within what contexts OAB coping behaviors are used, their relationship to emotional states, or how effective they are in helping individuals manage their OAB.

Because of the lack of information on coping behaviors in OAB, we sought to examine how frequently

women with OAB report using compensatory behaviors and whether these are associated with psychological factors, specifically anxiety, depression, and perceived stress, using previously collected data from a well-characterized sample of women with OAB. We hypothesized that women with greater symptoms of anxiety, depression, and perceived stress would also describe more frequent use of OAB coping behaviors.

2 | MATERIALS AND METHODS

2.1 | Sample

This is a secondary analysis of data from a cross-sectional study of 120 adult women with OAB recruited between 2014 and 2019 to undergo clinical phenotyping and mechanistic studies.¹³ Participants were included if OAB was diagnosed according to AUA Guidelines,¹⁴ but confirmed with a score of ≥ 4 on the OAB-V3 awareness tool.¹⁵ Women were excluded if they had diagnoses of neurologic conditions that might contribute to their urinary symptoms (e.g., spinal cord injury, multiple sclerosis, stroke, autonomic dysfunction); had a history of bladder cancer, pelvic irradiation, or bowel diversions; or were unable or unwilling to complete all study protocols. We also excluded women confirmed or suspected of having interstitial cystitis/bladder pain syndrome.

2.2 | Measures

Participants completed validated, condition-specific questionnaires. OAB symptom bother and impact on quality of life were assessed with the OAB questionnaire short form (OABq),¹⁶ which includes six items assessing symptom bother (OABq-SS) and 13 items assessing the OAB quality of life (OABq-QOL). Raw scores were transformed to a 100-point scale, with higher scores representing higher symptom bother on the symptom scale and lower scores on the QOL scale representing greater negative impact on QOL.

Compensatory bladder behaviors (i.e., coping), the primary focus of the study, were captured by five items from the OABq-QOL scale.¹⁶ Each behavior was recorded using a six-point scale (“1, none of the time” to “6, all of the time”) in response to the stem “In the past 7 days, how often have your bladder symptoms...,” with responses including: “caused you to plan escape routes to restrooms in public places”; “made you avoid activities away from restrooms”; “caused you to decrease your physical activities”; “made you uncomfortable while traveling with others because of needing to stop for a restroom”; and

“caused you to locate the closest restroom as soon as you arrive at a place you have never been.” Responses to these five items were summed to generate a total Coping Score (ranging from 5 to 30) for use in primary analyses (Chronbach's $\alpha = 0.81$), with higher scores representing more frequent interference with daily activities and thus poorer quality of life.

Lower urinary tract symptom severity was assessed with the International Consultation on Incontinence Questionnaire – Female LUTS questionnaire (ICIQ-FLUTS), which assesses 12 symptoms of filling, voiding, and urinary incontinence with five-point scales.¹⁷ Subscales of the ICIQ-FLUTS include urinary incontinence severity (ICIQ-UI) and OAB severity (ICIQ-OAB). Urgency urinary incontinence (ICIQ item #8) was dichotomized to less than “sometimes” and “sometimes” or more often. Participants also completed the Patient Perception of Bladder Condition (PPBC), which assesses the perceived severity of OAB symptoms across a six-point scale (none to very severe).¹⁸

To assess psychological symptoms, subjects completed the eight-item PROMIS anxiety and depression scales.¹⁹ The PROMIS instruments are scored using item-level calibrations through the PROMIS Assessment Center Scoring Service. The final score is represented by a T-score, a standardized score with a mean of 50, and a 10-point standard deviation calibrated to the general US population. A higher score represents more symptoms. To measure perceived stress, subjects completed Cohen's Perceived Stress Scale (PSS),²⁰ a validated 10-item scale that measures perceptions of stress, according to how frequently in the past month (0, Never to 4, Very Often) the respondent experienced stress-related symptoms. It is scored by summing the individual numeric responses, and ranges from 0 to 40.

In addition to these measures described above, information was collected on age, race/ethnicity, self-reported height and weight (for calculated Body Mass Index, BMI), level of highest education, current relationship status, and whether they currently use OAB medications.

2.3 | Statistical analysis

We hypothesized that greater emotional distress and perceived stress would be associated with greater use of compensatory bladder behaviors. For these primary analyses, our independent variables were anxiety and depression PROMIS scores and the PSS and our dependent variable was the Coping Score derived from the OABq-QOL, as described above. In secondary analyses, we also examined demographic and clinical data and

LUTS variables as independent variables predicting the use of compensatory coping behaviors.

Descriptive analyses used *t* test or χ^2 square analyses, as appropriate. Linear regression modeling was used to identify associations between coping measures and exposure variables. We constructed individual multivariable linear regression models for anxiety, depression, and stress and included clinical data that we selected a priori to adjust for confounders (age, BMI, relationship status, OAB medication, and OAB severity). Race/ethnicity was not controlled for in analyses because of the lack of diversity in the sample. All analyses were performed using Stata 16 (StataCorp).

3 | RESULTS

One hundred and twenty women met inclusion criteria and comprised the study sample. Table 1 displays demographic and clinical data for the subjects. The median age for the sample was 53 years, 80% were non-Hispanic white women, and 24% were taking OAB medications. Most (88%) subjects reported using at least one compensatory coping behavior at least “a little of the time.” Figure 1 shows the proportions of women reporting use of each coping behavior. The most frequently reported behavior was “Locating the nearest restroom in a new place,” which 72% of women endorsed, while “Decrease in physical activities” was the least frequent behavior, reported by 48% of subjects.

Figure 2 displays the positive associations between Coping Score and levels of perceived severity of OAB (none to very severe), as recorded by the PPBC. When we examined univariate associations between coping scores and our selected demographic and clinical data, we found that higher BMI, lower education, taking an OAB medication, and urgency incontinence were associated with higher coping scores (see Table 2). Urinary symptom scales (i.e., OAB severity [ICIQ-OAB], both [OABq-SS], and incontinence severity [ICIQ-UI] were also all positively associated as well.

Results from the multivariable regression models revealed that greater anxiety ($\beta = 0.15$, 95% CI [0.05–0.26], $p = 0.004$) and perceived stress ($\beta = 0.16$ [0.03–0.25], $p = 0.02$) were significantly associated with higher total compensatory coping scores with small to medium effect sizes, adjusting for age, BMI, relationship status, OAB medication, and OAB severity. Associations between depression and coping scores were only a nonsignificant trend ($\beta = 0.12$ [–0.01 to 0.25], $p = 0.06$).

TABLE 1 Study sample characteristics for 120 women with OAB

Measure	Median [25th, 75th percentile] or n (%)
Age, years	53 [40, 63]
Race	
Non-Hispanic white	96 (80%)
Non-Hispanic black	20 (17%)
Asian	2 (2%)
Hispanic	2 (2%)
BMI, kg/m ²	30 [24, 35]
Education	
Less than college graduate	51 (43%)
College, graduate, or professional	69 (57%)
Relationship status	
Single	26 (22%)
Married	67 (56%)
Divorced/separated/widowed	27 (22%)
Currently using OAB Meds	29 (24%)
OAB symptom bother (OABq-SS, range 0–100)	48 [33, 63]
OAB quality of life (OABq-QOL, range 100–0)	69 [50, 83]
OAB severity (ICIQ-OAB, range 0–16)	7 [5, 9]
Incontinence Severity (ICIQ-UI, range 0–21)	7 [5, 12]
Urgency Incontinence	84 (70%)
Patient perception of bladder condition (PPBC, range 1–6)	4 [3, 5]
PROMIS Anxiety (T Score)	51 [45, 57]
PROMIS Depression (T Score)	46 [38, 50]
Perceived Stress scale (range 0–40)	13 [8, 18]
OAB Coping score (range 5–35)	12 [7, 19]

4 | DISCUSSION

In this study, we identified several compensatory behaviors that women with OAB reported using to cope with OAB and found that most subjects (88%) reported using at least one of these behaviors. In these women, the use of compensatory coping behaviors, reflecting greater interference of OAB on daily activities and thus “poorer” coping overall, was associated with increased OAB symptom severity and bother as well as with the presence of urgency incontinence. As hypothesized, we also found

significant, small- to medium-sized associations between greater compensatory behaviors and higher self-reported levels of anxiety and psychological stress, even after adjusting for differences in OAB symptom severity. Similar findings for depression just failed to reach the criterion for statistical significance. Thus, these findings suggest that women with OAB and greater psychological distress report greater use of compensatory coping behaviors and that this relationship persists independent of the influence of OAB symptom severity. While these findings support our initial hypothesis, the directionality or causality of this relationship still remains unknown.

A few studies have specifically sought to examine coping in OAB, although much of the prior research is comprised of qualitative analyses identifying behaviors and strategies from focus groups, as reviewed by Norton et al.² The items assessing compensatory behaviors used in the current analysis are part of the OABq-QOL scale that was developed by Coyne et al.¹⁶ from results of focus group with individuals with OAB and intended to be used as a clinical outcome measure of the impact of OAB on health-related QOL. However, no information was provided in prior work on how frequently each behavior was used. Other focus group-based qualitative studies have identified similar themes and behaviors that individuals with OAB use to cope with their condition.^{4,7} Hartigan et al.⁶ more recently analyzed responses to open-ended questions about public restroom use from a large electronic survey study of 7000 women with and without OAB and identified several themes related to compensatory behaviors, including strategies for mapping and planning access to restrooms, resisting and delaying voiding, and restricting fluid. From the same study sample, Daly et al.⁵ reported that up to 50% of women with OAB will at some time use defensive or convenience voiding (i.e., just in case), map locations of restrooms, and avoid places where a restroom is not nearby. However, overall little is known about how commonly coping behaviors are used and how they might impact individuals' conditions.

The coping behaviors analyzed in the current study included seeking escape routes and immediate bathroom access in new environments, discomfort traveling with others, and avoidance of activities and places where bathroom access was unknown. These coping behaviors, representing strategies both to prevent OAB symptoms from occurring and to reduce anticipatory anxiety about feared situations, were significantly related to elevated emotional distress (i.e., anxiety and stress), irrespective of symptom severity. In OAB, conceptually (see Figure 3) it would follow that contextual cues or triggers related to OAB symptoms evoke anxiety. Then, in response, patients engage in compensatory

FIGURE 1 Proportions of women with OAB reporting compensatory coping behaviors. OAB, overactive bladder; RR, restroom

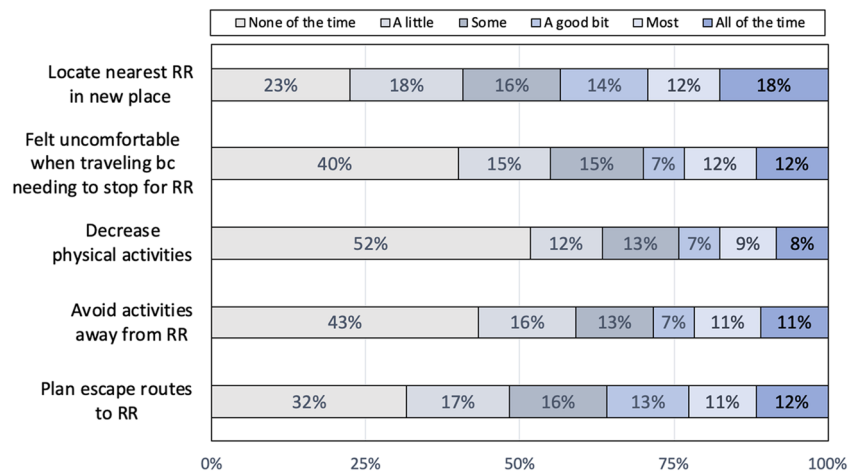
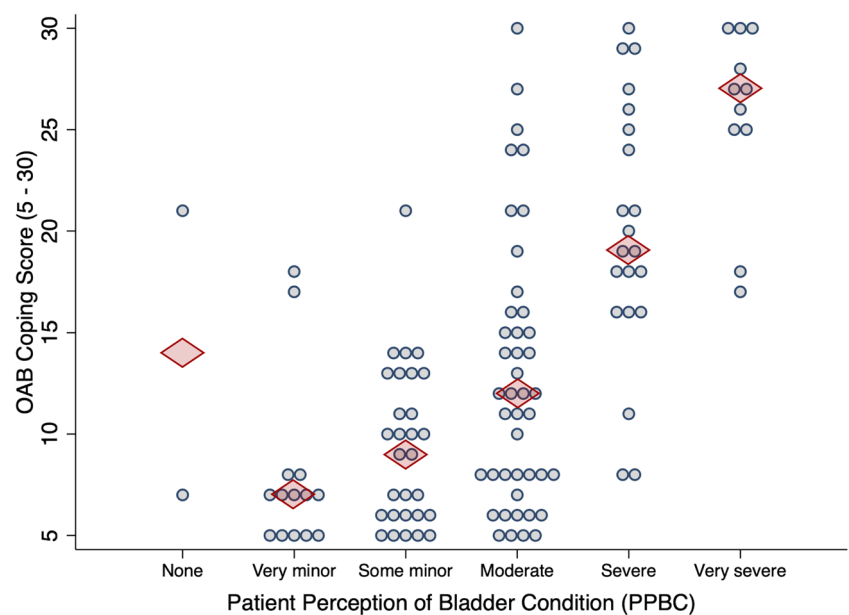


FIGURE 2 OAB Coping Scores according to OAB severity (measured by PPBC). Red diamonds represent median values. OAB, overactive bladder; PPBC, patient perception of bladder condition



coping behaviors, and after engaging in these, are likely to experience decreased anxiety about the feared situation. This reduced anxiety reinforces the coping behavior that was used (via operant learning processes),¹² making it more likely to occur again in the future. This anxiety-driven avoidance learning of compensatory coping behaviors, once developed, can become a self-sustaining process regardless of whether the coping behavior is in fact adaptive or maladaptive in terms of actually managing OAB symptoms. Of clinical importance, our anxiety-focused conceptual model can explain the persistence of maladaptive coping behaviors and associated reductions in quality of life *even in the context of objective reductions in medical OAB symptoms*. In sum, our findings suggest that individuals, particularly with high levels of anxiety, are at risk of developing maladaptive compensatory coping strategies that could contribute to reduced quality of life.

Anxiety-related avoidance learning processes as described above represent an important potential avenue of intervention for enhancing the quality of life of OAB patients. We further note that the “behavioral therapy” which is recommended as a first-line OAB intervention¹⁴ typically refers to either pelvic floor muscle therapy with urge suppression techniques, including biofeedback or electrical stimulation, or bladder training regimens, such as incremental or delayed voiding schedules and distraction techniques. Such therapy also typically focuses on lifestyle modifications, including dietary changes and fluid management, voiding techniques and habits, and weight loss. This form of behavioral therapy commonly used in OAB patients does not necessarily address psychological factors such as anxiety that are associated with OAB and which may drive the compensatory behaviors that contribute to reduced quality of life. In contrast, for other conditions such as irritable bowel syndrome,

	β coefficient	95% confidence interval		p
Age, years	0.1	-0.0	0.2	0.2
BMI, kg/m ²	0.3	0.1	0.5	0.001
Non-Hispanic white versus Non-white	0.4	-3.1	3.9	0.8
Less than college versus college or higher	-5.0	-7.7	-2.3	<0.001
Relationship status				
Singe	ref			
Married	1.2	-2.4	4.7	0.5
Divorced/separated/widowed	1.2	-3.0	5.4	0.6
Currently taking OAB medication	3.4	0.2	6.6	0.038
OAB severity (ICIQ-OAB)	2.1	1.7	2.4	<0.001
OAB quality of life (OABq-QOL)	-0.3	-0.3	-0.3	<0.001
Incontinence severity (ICIQ-UI)	1.0	0.7	1.2	<0.001
Urgency incontinence (sometimes or greater)	6.6	3.8	9.4	<0.001
PROMIS Anxiety	0.1	-0.0	0.3	0.1
PROMIS Depression	0.2	0.1	0.4	0.013
Perceived Stress scale	0.2	-0.0	0.4	0.1

TABLE 2 Univariate associations between OAB Coping behavior total scores^a and participant characteristics

^aGreater Coping scores reflect more frequent interference with daily activities and worse QOL.

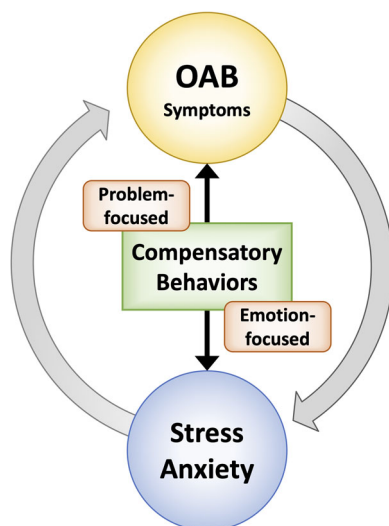


FIGURE 3 Conceptual model. OAB symptoms and emotional states (i.e., stress and anxiety) interact in a feed-forward, cyclical relationship (gray arrows). Compensatory behaviors can modulate this relationship (black arrows) by decreasing OAB symptoms (i.e., problem-focused coping behaviors) or by alleviating emotional responses (i.e., emotion-focused coping behaviors). Reduced emotional distress then reinforces the compensatory behaviors, making them more likely to occur again in the future. OAB, overactive bladder

anxiety-related behaviors are often primary targets for active and impactful interventions, typically employing cognitive behavioral therapy.²¹ The dearth of studies employing cognitive behavioral therapy in the published OAB literature suggests that it is rarely used as part of OAB management.

The present findings also point to potential avenues of future research. For example, in OAB patients certain contextual cues, such as opening the front door (“latchkey” urgency), cold weather, or running water, are believed to be associated with higher perceptions of urgency and severity of urgency incontinence.²² Currently, it remains unknown whether anxiety increases in response to these cues and whether coping strategies employed in response reduce this anxiety—prospective studies examining these temporal sequencing and causation issues have not been performed. Anxiety, depression, and stress have all been associated with OAB, although usually in cross-sectional studies and a few long-term observational cohort studies.^{3,23,24} There is little prospective research at a more granular level examining how bladder symptoms, psychological state, and compensatory coping behaviors may reinforce one another in the daily lives of OAB patients. Ecological momentary assessment approaches commonly used in the fields of psychology and chronic pain to evaluate relationships between symptoms

and emotional experiences in a “real life” setting multiple times per day for a week or more may be ideal to better elucidate these hypothesized relationships.

There are several limitations that need to be considered in relation to these findings. This is a secondary analysis of cross-sectional data collected from women recruited with OAB to undergo phenotyping and clinical testing and not specifically to evaluate compensatory behaviors. Findings from the current selected sample may not be generalizable to the OAB population as a whole. The relatively modest sample size also limited the analyses and subgroup investigations that we were able to perform. While subjects did complete a valid, patient-reported outcome measure that included items relevant to assessing compensatory coping behavior (OABq-QOL), our coping scale measure derived from these validated questionnaire items has not itself been independently validated. Given our reliance on coping items included in an existing measure, we also did not assess for some other behaviors that are known to be used for coping, such as fluid restriction or containment products (i.e., pads). Additional work is needed to develop and validate methods and instruments that are able to capture these constructs, and prospective studies are needed to examine how frequently and in what contexts women with OAB employ these compensatory behaviors.

5 | CONCLUSIONS

Compensatory bladder coping behaviors were common in this sample of women with OAB. Higher coping scores (i.e., greater interference of OAB on daily activities) were positively associated with greater urinary symptom severity, as well as with higher psychosocial burden (anxiety and stress) independent of urinary symptom severity. Further prospective research is needed to better understand how compensatory coping behaviors and psychosocial factors relate, as these may represent important opportunities for effective psychosocial interventions in OAB patients.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Substantial contributions to conception and design: William Stuart Reynolds, Lindsey C. McKernan, and Stephen Bruehl. *Drafting and revising the article critically for important intellectual content and final approval of the*

version to be published: William Stuart Reynolds, Lindsey C. McKernan, Stephen Bruehl, Melissa R. Kaufman, and Roger R. Dmochowski.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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