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Views of Normal Bladder Function among Women Experiencing Lower Urinary Tract Symptoms

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Abstract

Objective: To explore the perspectives of normal bladder function among women with lower urinary tract symptoms (LUTS).

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Disclaimer
The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Data Sharing
LURN is committed to collaboration with ancillary investigators in order to further the scientific goals of the study, and the field of lower urinary tract dysfunction research as a whole. We invite interested researchers to learn more about collaborative opportunities with LURN and apply to become an ancillary investigator of LURN.

Methods: This was a secondary analysis of qualitative data from structured interviews with 50 adult women with LUTS. A directed content analysis of the transcripts explored women's perspectives on normal bladder function.

Results: Participants' descriptions of "normal" took many forms and were based on several aspects of bladder function. A prominent feature of normal was that voiding occurred as a seamless process, beginning with an urge sensation, followed by voiding with ease and to completion, and then "being done." Descriptions of normal were based largely on concepts of voiding regularity, including voiding frequency, intervals, and patterns during the day and night. Another aspect of normal bladder function was the notion of having control in terms of not leaking urine, as well as the ability to hold urine and defer urination. Views of normal bladder function extended to the absence of symptoms and the impact of being symptom-free on day-to-day life, including not having to think about or worry about the bladder or limit daily activities.

Conclusions: Women's perspectives on normal bladder function are multi-faceted, reflecting attributes most salient to each individual and likely informed by their personal experience with symptoms and their influence on daily life. This work has implications for how clinicians might engage women in discussing bladder symptoms and can inform future research and public health messaging about normal bladder function.

Keywords

Lower urinary tract symptoms; bladder health; bladder function; women; qualitative research; interview

Introduction

Bladder conditions, including lower urinary tract symptoms (LUTS), are associated with substantial economic, social, and emotional costs, and negatively impact overall health and health-related quality of life for individuals and society at large.[1] There have been widespread calls to promote bladder health through primary prevention, increased awareness, education initiatives, and targeted research.[2-4] Heeding these calls requires some concept of what constitutes bladder health, including, "normal" bladder function.

Among the issues facing researchers and clinicians is how to define thresholds of what is "normal" bladder function and how it is perceived by women. Current formulations of "normal" are typically based on physiological metrics of bladder function, such as storage and emptying parameters.[5-10] Other investigators characterize normal bladder habits in asymptomatic women using self-report measures.[8-14] Further, emerging research on the bioregulatory function of the bladder is characterizing the female urinary microbiome to identify characteristics associated with bladder health and disease.[15-17]

These formulations are useful for establishing normal parameters in various domains of bladder function. However, they do not capture fully the lived experiences shaping women's perceptions of normal bladder function. For example, important aspects of health as defined by the World Health Organization (WHO) include not only the absence of dysfunction or disease, but also a complete state of physical, mental and social well-being of the individual.[18] The Prevention of Lower Urinary Tract Symptoms (PLUS) Research Consortium, adopted a similarly broad and contextual approach to defining bladder health in terms of bladder function that "permits daily activities on a routine basis, is adaptable to short term physical or environmental stressors, and allows a woman to pursue her optimal well-being (e.g. travel, exercise, social, occupational or other activities), not just the absence of LUTS."[19]

To fully characterize normal bladder function and related well-being, it is important to explore how women conceptualize and make meaning of bladder-related experiences. A good starting point for this inquiry is to seek input from women who have experienced LUTS and presumably can convey their experiences across the spectrum of normal and symptom-grounded bladder function.

The purpose of this analysis was to explore views of normal bladder function among women with LUTS, including those who have and have not sought treatment, recognizing their insights may differ compared to asymptomatic women. Increased understanding of how women with symptoms view bladder function has potential to shape patient-provider interactions, guide research, and inform public health educational initiatives to promote optimal bladder health and function of women.

Materials and Methods

This was a secondary analysis of qualitative interview data from the Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN).[20] LURN is a cooperative research network sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), a division of the National Institutes of Health (NIH). The goal of LURN is to increase understanding of LUTS by 1) improving measurement of patient experiences of LUTS; 2) identifying and explaining important subtypes of LUTS; and 3) disseminating data, research tools and biosamples to research and clinical communities. This secondary analysis was conducted by investigators from the PLUS Consortium, an NIDDK-funded network established to develop the scientific basis for prevention of LUTS and promotion of bladder health for women across the life course.[21]

Participants and Interviews

Qualitative interviews were conducted with 50 adult women and 38 men. The original interview framework was designed to inform the development of new self-report measures of LUTS incorporating lay experiences, including onset, duration, associated bother, and change over time. Participants were not queried about specific treatments or outcomes.

Participants were recruited from the clinical practices and communities of LURN investigators at four participating sites. To be eligible, participants had to report one or more LUTS on a telephone screening questionnaire with a symptom checklist.[20]

Individual face-to-face interviews were conducted by trained interviewers (8 women; 2 men), using a structured interview guide to query participants about LUTS. Interviewers received training in interview skills via didactic sessions and role play. The number of interviews conducted by each interviewer ranged from 1-28 (Mean=10). Interviews were audio-recorded and transcribed for analysis and assessment of data consistency.

Analysis

A directed content analysis was conducted using interview data collected from the 50 women participants (excluding men). It was performed by a transdisciplinary team of PLUS Consortium investigators with specialists in urology, gynecology, nursing, medical sociology, behavioral science and public health. Five pairs of investigators independently coded assigned text in word documents, checked agreement, and resolved disagreements through debriefing. A third investigator reviewed the entire body of coded data to ensure fidelity to coding parameters and consistency across coding dyads.

The prioritized area of analysis was participants' views of normal bladder function in response to the question, "In your own words please describe normal bladder function". The "Normal Bladder Function" code incorporated unprompted comments about characteristics of normal bladder function. The coding scheme integrated subcodes from the socioecological framework focusing on individual factors (bodily sensations, bodily functions, personal-emotional), interpersonal processes (social interactions and relationships), institutional structures (recognized and organized norms), and cultural contexts (shared meanings and beliefs).

Data interpretation was an open-ended, team-based inductive process informed by a transdisciplinary perspective. Interpretation included reflection on coded data and subsequent team dialogue to discuss emerging themes and reach consensus.

Results

Participants ranged in age from 19 to 77 years (Table 1). The majority were non-Hispanic (90%), 72% were white, and 16% were Black. Participants experienced a range of LUTS, the most common being urgency, nocturia and incontinence; 76% had sought treatment, including some recruited from the community.

Participants' descriptions of "normal" took many forms and were based on several aspects of bladder function. We identified the following emergent themes.

Voiding as a Complete Seamless Process

A prominent feature of normal as described by participants was that voiding would occur as a seamless process comprising (1) occurrence of a recognized urge sensation early enough to allow a woman to get to a bathroom without having to rush; (2) voiding comfortably and with ease to completion; and (3) "being done." This is illustrated in the following exemplary quotes:

> "A signal is sent to your brain from your bladder telling you that you need to use the restroom. You go to the restroom at your next, earliest available time and sit down and within ten seconds something should start to come out and probably void for thirty to forty-five seconds and you're done. That, I think is what normal bladder function should be."

> "I think the bladder and your mind must work together, too, because you must have a sensation of, "It's time to go." Everybody has that, you kind of learn that

> sensation and normally you just get up and decide to go to the bathroom and it’s no problem.”`

> “I would say when you go to the restroom and, you know, you just use the restroom and you’re fine. You don’t experience any pain and, you know, you do what you have to do and you’re finished.”

Timing and Frequency of Urination

Descriptions of normal were based largely on concepts of voiding regularity, including timing and frequency of urination and voiding intervals. For some women, normal meant voiding “on a regular basis throughout the day.” Several participants focused on the number of times one would void in a day, as one woman noted,

> “I’d say maybe urinating three to four times a day. I don’t know. I guess that’s what I would think.”

Others referred to specific times during the day and night when voiding occurs in the context of other routine daily activities.

> “I would say just starting with morning, I would consider normal urinating as soon as you get up in the morning and probably again late morning, mid-afternoon, after dinner, and bedtime.”

In some cases, women acknowledged other factors that provide context for frequency, such as age or fluid intake, and shape conceptions of normal voiding frequency.

> “Normal. I would say maybe first thing in the morning and then maybe a couple times during the day and then at night before you go to bed, maybe once or twice during the night at my age, I don’t know. But, to me, five times a day would be heaven.”

> “I think the normal was, for me, to go to the bathroom like four or five times during the day, if you drink water, and at night before you go to bed, that should be it… even if you-if you get up, it should be like one time or two times.”

Frequency of nighttime voiding was mentioned often and was salient due to its disruption of sleep. One woman explained that normal functioning meant “being able to go through the night and not have to wake up and pee,” while another commented that voiding should occur “just usually once per night.”

> “Well I would say normal functioning would be someone who usually would go probably maybe every four to five hours and once in a while they might get up once at night, a lot of times they sleep through the night. That’s normal, is what I understand.”

> “In my own words, at least four hours between urinations. Being able to sleep through the night or possibly getting up, you know, one time maybe during the night.”

Urine Control and the Ability to Defer

Another aspect of a normal bladder was the notion of having “control,” as in being able to hold urine, defer urination, and not leak.

> “Normal bladder functioning is you’d have to hold your pee quite a few times before you feel that sense of urgency, and you can hold it without having to worry, or think, you know, you’re about to leak or something. Now- so normal- a normal bladder would mean like if I have to go to the bathroom, I can hold it and hold it for a while without being worried about it or without leaking.”
>
> “Normal bladder function is that you would feel an urge to go to the bathroom and you wouldn’t leak and you could control it.”

Women often mentioned the timeframe associated with deferring urination, including the ability to hold to accommodate other activities.

> “To me normal bladder functioning is being able to control your bladder, no matter what the timeframe is.”
>
> “You know, if there’s something that’s going on that you can’t go to the bathroom right away, being able to hold it until you can get to the bathroom. That’s about it.”
>
> “I think normal like be able to hold your urine for whatever amount of time you can or like, not like half an hour, ten minutes.”

Absence of Symptoms

In addition to not leaking urine (incontinence) and not having to void at night (nocturia), participants noted that normal meant the absence of symptoms, including urgency and pain. Many women described this in the context of health conditions they might have experienced including infections.

> “Well, just being able to go to the bathroom when you feel the urge and not have any signs of any infection or blood and no pain and not have to get up at night and go to the bathroom.”
>
> “I suppose no kidney infections and no urinary symptoms and being able to go through the night and not have to wake up and pee.”
>
> “Normal would be no leakage, no urgency, you would just have to use the restroom when your bladder’s full.”

Not Having to Think or Worry about the Bladder

Women also associated normal bladder function with not having to think about the bladder. This contrasts with the experience of women who often are preoccupied with managing or avoiding symptoms.

> “Just peeing when you feel the urge to go, emptying your bladder, and then not worrying about leakage.”

One participant frames not having to think about her bladder when it is in the state she expects:

> "You just kinda take it for granted. I don't really think about it when it's okay. It's just something that I expect."

Daily Life without Limitations

Some participants described normal bladder function in relation to activities of daily life, describing what it allows them to do.

> "You should be able to go and do your daily stuff without having fear you're gonna have an accident."

> "When I worked, I could work all day long and never have to go to the bathroom."

A normal bladder enabled a life without limitations, unrestricted in terms of being able to drink freely and go about one's usual activities without concern about finding a bathroom or having urine leakage.

> "Normal bladder function is being able to walk through, let's say, an area, *shopping center*, upstairs and downstairs, and drink a drink and not have to go to the bathroom shortly thereafter.

> "Oh, activities. Just walking, jogging, picking up my kids, shopping around with them, you know, just normal activity."

> "Certainly being able to laugh, sneeze and cough without, (*laughs*) you know, having anything leak out of you."

Symptoms as Normal

For some women, the presence of some symptoms was regarded as normal if such symptoms were expected given their situation. They often anchored their symptoms to a life event or life course. Childbirth was commonly associated with symptoms and cited in the normal onset of LUTS.

> "I think for me with my two children, two C-sections, I think my amount of incontinence is pretty normal."

Urinary tract infections were accepted as common or typical in the younger years.

> "After my second child I started getting like urinary tract infections and I'm like, 'Hmm, this is kind of, you know, off and on,' … I had them when I was younger, but I think every woman has 'em at some point when they're younger."

Incontinence was associated with aging, with some participants viewing it as expected and normal.

> "I know in the back of my mind that some of this is just part of getting older, although I'm a little more accelerated than I- that was the nice thing about the physical therapist is she can say, 'Well, normally for people your age this is where they're at. Normally in their fifties and their sixties, this is where they're at.'"

> "I mean I just attribute it to, "You know, you're getting older and things are getting, you know," I mean, I'm almost 60 years old, so, I thought maybe it was just age."

Other life course anchors included the menopausal transition.

> "Well, in terms of just what I call normal leakage, you know, that has increased over time and it started increasing about the time [of] perimenopause."

Comment

To our knowledge, this is the first study to examine women's views on what they consider normal for bladder function. We found that women's perspectives are multi-faceted, reflecting attributes most salient to each individual and likely informed by their personal experience with symptoms and their influence on daily life. Their descriptions incorporate several qualities of bladder sensation, voiding patterns, and control. Articulating what is normal, women characterize voiding as a smooth or seamless process of awareness and voiding to completion without problems and with finality. They discussed not only an absence of symptoms, but also other dimensions of health, such as control over voiding and leakage, not having to think about or worry about the bladder, and the ability to engage in usual daily activities. Women also expressed a tendency to see LUTS within the spectrum of "normal" if symptoms were mild or attributed to childbirth or aging. It is noteworthy that some of the themes were intertwined and women often invoked two or more attributes to describe what they thought would be "normal."

The themes identified in this analysis are consistent with the WHO conception of health and aligned with the PLUS definition of bladder health, in that normal bladder function was more than the absence of symptoms; it included the ability to function as desired in daily life. This underscores that the way women with LUTS experience think about bladder health is consistent with broader consensus-based perspectives, which also recognize the physical, mental, and social well-being of the individual. Participants conceived of normal bladder function as not simply a physiological or biological condition, but also as a state that permits activities and engagement with others.

This analysis adds an element not included in the WHO and PLUS definitions, which embrace an aspirational standard of "a complete state of physical, mental, and social wellbeing." In this analysis, women with LUTS considered mild symptoms and those associated with certain conditions as within normal limits. This may be grounded in their own experience and on information acquired from other women and encounters with health professionals.[22-28]

These results also add a dimension to the literature on normal bladder function that focuses on physiological parameters and measures of bladder habits. For example, in women's descriptions of normal bladder function, frequency of urination is understood not in terms of bladder capacity and thresholds for sensation, but in the context of its aligning with daily routines or its disruption of a woman's state of mind and limitations on usual activities. Thus, this finding adds depth to our understanding of the definition's concepts of "physical, mental, and social well-being of the individual."

It is important to note that the women in this study all had LUTS, and 76% had sought treatment. One advantage of studying a sample of women with LUTS is that they presumably have experience with being symptom-free earlier in their lives. Because of this, they can take a comparative approach, articulating what is a normal bladder in the context of having symptoms, as well as from the perspective of having been symptom-free. Some women described their views retrospectively, describing a time before the onset of symptoms, when they could not appreciate the experience of bladder symptoms: “You don’t know what you’ve got until it's gone.”

The findings of this analysis have several implications for patient-provider communication. Understanding a woman’s view of “normal” may facilitate discussions and decisions about evaluation and treatment. Clinicians naturally communicate through a lens of knowing the physiological bases of a condition and potential treatment options. Increased understanding of the negative impact of LUTS and a woman’s concept of what is normal may inform goals of care and decisions about optimal interventions for individual women. For example, one important decision may be about whether to offer surgery for incontinence. Ordinarily, decisions about the risk/benefit ratio depend on a multitude of factors, including a certain clinical threshold of severity and likelihood of meaningful improvement. Understanding a woman’s view of the impact of LUTS in terms of limiting her life/activities and her views of what would be normal for her may produce a threshold for surgery that is quite different from that of the surgeon. If clinicians are informed about women’s perspectives of normal bladder function it could improve the process of informed treatment decision-making and shed light on why some women choose to live with and manage LUTS, rather than undergo symptom-reducing treatment.

The findings about women anchoring certain symptoms to the life course and life events and considering them to be within the spectrum of “normal” is relevant for clinicians. It is widely known that the majority of women with LUTS do not seek treatment, often believing it is normal. However, attributing LUTS to an irreversible or inevitable state, such as aging, can lead women to believe their symptoms are not treatable. In addition, when women contextualize “normal,” they may report they have no bladder problems if symptoms are mild or self-managed with adaptive techniques.

This is pertinent for the language clinicians use to screen for bladder problems as it may influence the elicited responses. Screening could be adapted by not simply asking about symptoms, but also inquiring about the experience of LUTS and its impact. Further, insight into how women think about symptoms provides an opportunity for providers to engage in conversations with patients about alternate approaches, including treatment when appropriate. Some women are known to alter their expectations of treatment based on new knowledge gained through interactions with providers. This is consistent with research suggesting that clinicians develop a shared understanding with patients of normal bladder function.[29,30]

A strength of the analysis is the sample size, which is large for a qualitative study. In addition, the analysis was conducted by an interdisciplinary team composed of both women and men, which helps to avoid preconceived notions of normal defined by a single discipline or sex. This increases the transferability of our findings and confidence in the themes that emerged.

A limitation of the analysis is that the notions of bladder function that emerged may not represent those of women without LUTS experience. Asymptomatic women may have a different awareness of their bladders and use different language to describe “normal.” For women who have not had symptoms or experienced related discomfort or inconvenience, bladder function may be less salient. To fully understand women’s views of normal bladder function, future research should explore the perspectives of asymptomatic women of all ages across the life course.

Conclusions

To hear women with LUTS describe "normal" bladder function, using their own words and experiences, gives shape to a concept that has biological, psychological and social dimensions. We find it significant that women viewed normal bladder function not only in terms of symptoms, but also in terms of impact on daily life. This more robust picture of what constitutes normal has implications for how clinicians might engage women in discussing bladder symptoms, evaluation, and treatment to optimize well-being of individual patients. Findings also inform future research addressing patient-provider communication, including treatment goals, patient-centered definitions of treatment success, and shared decision-making, as well as public health messaging about bladder health.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1.

Characteristics of Participants

	Total (N=50)
Age	
Range, yrs. (min, max)	19, 77
Mean, yrs. (SD)	51.0 (15.0)
Race n (%)	
Asian/Asian American	1/50 (2)
Black/African American	8/50(16)
Native Hawaiian/Pacific Islander	1/50 (2)
White	36/50 (72)
Other/Multi-racial	4/50 (8)
Ethnicity n (%)	
Hispanic/Latino	4 (8)
Non-Hispanic/Non-Latino	45 (90)
Unknown/Missing	1 (2)
[*]**Lower urinary tract symptoms** n (%)	
Frequency (n=42)	10(24)
Nocturia (n=42)	
1 time per night	13 (31)
2 times per night	22 (52)
Urgency (n=42)	34 (81)
Pain/discomfort in bladder area (n=42)	10(24)
Burning with urination (n=42)	5 (12)
Incontinence (n=41)	
Rarely	3 (7)
Sometimes or greater	27 (66)
Sought treatment	38 (76)

[*] Based on responses to individual items of the LUTS Tool questionnaire