

Prevalence of Overactive Bladder Syndrome Among Adult Females Having Stress Urinary Incontinence and Urge Urinary Incontinence Using Overactive Bladder Syndrome Questionnaire

Dr. Juilee Khadke¹, Dr. Abha Dhupkar²

¹Master of Physiotherapy (Community Physiotherapy) D.E. Society's Brijlal Jindal College of Physiotherapy, Shivajinagar, Pune

²Associate Professor, D.E. Society's Brijlal Jindal College of Physiotherapy, Shivajinagar, Pune

Corresponding Author: Dr. Juilee Khadke

DOI: <https://doi.org/10.52403/ijhsr.20230306>

ABSTRACT

Objectives: To identify the proportion of OABs using OABs-q in adult females classified as SUI or UII based on the results of the questionnaire for female urinary incontinence diagnosis (QUID).

Material and Methods: 243 females of age group 18-55 years were screened for incontinence, of which 102 were included in the study. Questionnaire for Urinary Incontinence Diagnosis and Overactive Bladder questionnaires were administered and the type of incontinence of the women was identified. Proportion of OAB was identified in SUI, UII and MUI.

Results: 102 out of 240 had incontinence, of which 41 women had SUI, 30 had UII and 31 had MUI. Proportion of OAB was 17%, 60% and 87% respectively in SUI, UII and MUI.

Conclusion: Overactive bladder syndrome has a higher proportion amongst women showing mixed urinary incontinence.

Keywords: Stress urinary incontinence, Urge urinary incontinence, Mixed urinary incontinence, Overactive Bladder syndrome, QUID, OAB-q.

INTRODUCTION

The term continence is used when a person is able to control his/her bladder and bowel consciously. The International Continence Society has termed that the stable bladder is the one that holds a normal capacity without any increase in bladder pressure. Unless provoked, no involuntary contraction is seen⁽¹⁾. Another description of continence is normal ability of a person to store urine temporarily, with conscious control over the time and place of micturition⁽²⁾.

There is considerable variation in a normal urine volume that is stored, and also in the frequency of micturition. The normal storage capacity of stable bladder in premenopausal women is 50-70cm and 40-

50cm in postmenopausal women and for men it is 60-90cm of water.⁽²⁾ The normal continence in females is the compound organization between the bladder, urethra, pelvic muscles and surrounding connective tissues. The pontine centers in the brain controls the storage and modulation voluntarily.⁽³⁾

The second factor maintaining continence is intraurethral pressure (IUP). At rest, the IUP is 20-50 cm of water normally. This is considerably higher than the intravesical pressure (IVP); 5-10 cm of water, at rest. The intraurethral pressure is maintained by:

1. Positioning of longitudinal mucosal folds.
2. Submucosal vascular plexus.

3. Deposition of collagen and elastic tissues throughout the circumference of the urethra.
4. Tonic contraction of the smooth muscles in the proximal urethra and bladder neck.
5. Rhabdo-sphincter in the mid-urethra and levator ani muscles.⁽⁴⁾

Pelvic floor muscle is responsible to store and evacuate urine and stool.⁽⁵⁾ To store and to expel urine are the two functions of bladder. To maintain the continence or controlling the urine or faeces requires a complex interaction between detrusor muscle activity and urethral sphincter closure pressure controlled by the nervous system.⁽⁶⁾ The anorectum and pelvic floor are supplied by sympathetic, parasympathetic and somatic fibres.⁽⁵⁾ Spinal reflex mechanisms activate sympathetic and somatic pathways to bladder outlet and the tonic inhibitory systems in the brain - that suppress parasympathetic excitatory outflow to the bladder, so that the muscle remains activated or contracted. Distention of the bladder walls during filling phase leads to sympathetic stimulation of the bladder outlet, smooth musculature and pudendal outflow to the external urethral sphincter. Sympathetic stimulation also inhibits the bladder musculature and transmission of impulses in the bladder, by parasympathetic ganglia. These responses occur by spinal reflex pathways and represent reflexes that promote continence.⁽⁷⁾ The muscular structures involved are the levator ani, urethral sphincter muscles and detrusor, all of which play a major role⁽⁵⁾. When storing, the levator ani and sphincter muscles contract and the detrusor muscle stops contracting, whereas, when voiding the levator ani and urethral muscle sphincter muscle relax and the detrusor muscle contracts.⁽²⁾

The International Continence Society defines urinary incontinence as the complaint of any involuntary loss of urine (ICS2019). Several studies suggest that the risk of UI runs in the family. Many studies

have been published, estimating the prevalence varying from 5% to 25% for women aged 15 to 64 years and 12% to 38% for women over 60 years, with women twice as likely to experience incontinence as men.⁽⁸⁾ Prevalence in Asian countries ranges from 26% to more than 30%, depending on the type of incontinence and age of population and significant societal and financial burden⁽⁹⁾. As it was difficult to find the prevalence of urinary incontinence, Jennifer Wu conducted a nationwide study in California. This study found prevalence of urinary incontinence to be 46.7% with stress being the most common form of urinary incontinence at 25.2% followed by mixed (12.4%) and urge (7.6%).⁽¹⁰⁾

Although not a dangerous condition it can interfere with daily life and consequently influence the quality of life of complainants. It is generally assumed that a large number of patients suffer in silence, and that shame, and a low expectation of the benefits of treatment are hindrances to seek medical advice.⁽¹¹⁾

Multiple risk factors can lead to development of urinary incontinence, which are:

1. Damage during childbirth
2. Neurological condition such as stroke, multiple sclerosis, and Parkinson's disease
3. Obesity
4. Damage due to surgery nearby or on the bladder- this can damage the nerves or the connective tissue.
5. Chronic urinary tract infection⁽¹²⁾
6. Certain medication like oral estrogens, alpha blockers, sedatives, antidepressants, antipsychotics, ACE inhibitors, loop diuretics, NSAIDs and calcium channel blockers.⁽¹³⁾
7. Congenital conditions such as cerebral palsy
8. Constipation
9. Fluid intake- drinking too much alcohol or caffeine or poor fluid intake can cause strong concentrated urine which can irritate the bladder and cause urgency and frequency.⁽⁶⁾

In all the conditions giving rise to urinary incontinence, the basic pathophysiology is the rise of intravesical pressure over that of a maximum urethral pressure.⁽⁴⁾ It may also be due to mechanical injuries, such as any spinal cord injury that affects the supports of the bladder neck. Sudden increase in intra-abdominal pressure can overload and/or stretch the pelvic floor muscles (PFM) and predispose to symptoms of urinary incontinence.⁽¹⁴⁾ The drug induced urinary incontinence occurs since the drugs frequently metabolise and excrete in the urine as a result the lower urinary tract gets affected and causes adverse effects.⁽¹³⁾ Urinary incontinence can be evaluated by obtaining a comprehensive history and performing clinical assessment of the pelvic floor specifically. A helpful concept in urinary incontinence is that of “bother.” Bother determines how much incontinence has an effect on patients physically, socially, and emotionally health. Although the severity of incontinence can be quantified by measuring the quantity of leakage, the degree of bother is crucial in determining how much intervention a patient wishes and how successful that intervention may be.

The main types of urinary incontinence can be distinguished:

1. Stress urinary incontinence is the complaint of involuntary leakage on effort or physical exertion or on sneezing or coughing.
2. Urgency urinary incontinence is the complaint of involuntary leakage accompanied by or immediately preceded by urgency, where urgency is a sudden compelling desire to pass urine, which is difficult to defer.
3. Mixed incontinence is where the symptoms and signs of stress and urgency incontinence coexist.⁽⁷⁾

Some patterns of incontinence are not very easily classified into the above categories: Extra-urethral incontinence is the observation of urine leakage through channels other than the urethra (such as a fistula or an ectopic ureter)⁽⁷⁾. Of those victims who seek medical attention, it is

estimated that 30% receive no treatment or assessment of the symptoms and approximately 80% are not treated.⁽¹⁵⁾

Stress urinary incontinence is defined as the complaint of any involuntary loss of urine on effort or physical exertion or on coughing or sneezing. (ICS2018). Though considered to occur predominantly in females, only 15% of women seek care with SUI.⁽¹⁶⁾ Women with stress urinary incontinence reported incontinence with sexual penetration; reduced ability to reach orgasm; lower frequency of sexual intercourse; and less desire, arousal, lubrication, and satisfaction. Incontinence with pelvic organ prolapse also may influence sexual function by disturbing sexual responses (i.e libido, excitement, and orgasm), social relationships, and intimacy.⁽¹⁷⁾ Pelvic organ prolapse is the descent of 1 or more of the vaginal walls, cervix, uterus or vaults. Both urinary incontinence and pelvic organ prolapse have been found to depressingly affect physical, social, and emotional domains of quality of life. It is highly suggested to include social, cultural, and physical environmental issues as a part of a full assessment of women with urinary incontinence and pelvic organ prolapse.

Stress Urinary Incontinence occurs because of a direct relationship with physical effort when high impact exercises are done and chronically increased abdominal pressure, which are strong factors impacting pelvic floor functioning among young sports women.⁽¹⁸⁾

The BMJ (2020) defined urge incontinence as involuntary, spontaneous urine loss that is associated with an uncontrollable sense of urgency. This condition can severely inhibit the activities of the affected individual daily for fear of awkwardness due to its randomness of urination. It is usually of mixed etiology, and the symptoms are primarily the sudden onset of micturition unexpectedly in any circumstances. Urge incontinence can have disturbing effects on the patient, and is detrimental to levels of activity and psychosocial state (British

Medical Journal (BMJ), 2020). The condition may, therefore, lead to depression and extraction from social settings. The most common symptom is the frequent and sudden urge to urinate, with irregular leakage of urine. The BMJ (2020) stated that urge incontinence may be caused by variations in structural support and/or neuromuscular function of the pelvic floor, or it may be idiopathic.⁽¹⁹⁾

People with UI report an irresistible sensation or substantial desire to pass urine and then suddenly do so without intention. Many reasons such as opening their front door, sex, feeling nervous or the sound of running water, can speed the symptoms. Thus, they are aware of their bladder feeling full and respond to the need to urinate, but they find it difficult in delaying urination until they reach a toilet. The stability and sensitivity of bladder appear to be disturbed in urge incontinence. Furthermore, the sensation of bladder fullness can decrease the functional capacity of the bladder, resulting in frequent trips to the washroom to excrete urine. The idiopathic and hypersensitive nature of the urinary incontinence emphasize on psychological rather than physiological factors.⁽²⁰⁾

Urinary incontinence can be diagnosed using a self-administered questionnaire, the Questionnaire for Urinary Incontinence Diagnosis (QUID). The questionnaire has 6 items which intend to distinguish between stress urinary incontinence and urge urinary incontinence.⁽²¹⁾ This scale is valid and reliable tool to identify different forms of incontinence. QUID stress and urge scores with sensitivities and specificities 85% and 71% and 79% and 79% and Cronbach's α (reliability) values of .85 and .87 which is good and valid. This questionnaire will help in diagnosing the type of incontinence, whether stress, urge or mixed incontinence.⁽²¹⁾

Overactive bladder syndrome (OABS) can mimic stress as well as urge incontinence. The symptoms of OABS are thought to be caused by involuntary contractions of the detrusor muscle during the filling phase of

the micturition cycle. Overactivity of the detrusor muscles causes urgency and frequency of micturition which may be associated with or without incontinence.⁽¹⁵⁾

Overactive bladder becomes more prevalent with age. This is important because forecasts taken from UN statistics predict that the proportion of the population ages 65 or older will approximately double in many decades. Nevertheless, a considerable proportion of younger population has also report with OAB symptoms and UUI.⁽²²⁾ Damage to central inhibitory pathways or sensitization of peripheral afferent terminals in the bladder can expose primitive voiding reflexes and trigger bladder over activity. The symptoms of OAB with or without UUI (urge urinary incontinence) are bothersome and are associated with reduced health related quality of life. Overactive bladder (OAB) executes a substantial socioeconomic burden on the healthcare system. It is a commonly held belief that increased fluid intake (eight glasses of water a day) is beneficial for one's health; however, increased fluid intake aggravates OAB symptoms.⁽²³⁾

Disturbance in nerves, smooth muscles, and urothelium can cause this condition. In some respect the division between peripheral and central causes OAB is false, but it remains standard for appreciating the interactions between different tissues. Increased excitability and connectivity of nerves involved in micturition rely on growth factor that manage the neural plasticity. Smooth muscle from unstable bladders often shows enhanced spontaneous contractile activity.⁽²⁶⁾ According to ICS 2018 the revised definition of over active bladder is urinary urgency, usually with urinary frequency and nocturia with or without urgency urinary incontinence. It also termed as urinary frequency and urgency or urge leakage. In 2014, the international consultation on incontinence research society (ICI-RS) proposed that, "overactive bladder syndrome is characterized by urinary urgency, with or without urgency urinary incontinence,

usually with increased daytime frequency and nocturia, there is no proven infection or other obvious pathology.

The use of the Overactive Bladder Questionnaire (OAB-q) is a widely accepted tool to measure the OAB symptoms and Health Related Quality of Life.⁽¹⁰⁾ OABs with the internal consistency reliability coefficient is 0.76-0.94 and test-retest reliability coefficient is 0.72-0.87.⁽²⁷⁾

OAB-q is a multidimensional instrument devised to examine an individual's perception of symptoms that bother or have an impact on health-related quality of life, in persons with and without OAB symptoms. This scale has been consistently found to be more reliable, valid, and is responsive to change in the intensity of the condition. The items of the questionnaire deal with symptoms that the individual reports and the effect of these symptoms on their QoL. Individuals were considered to have urinary frequency if they reported urinating more frequently than every 2 hours, urinating frequently during the day (fairly often, usually or almost always), or urinating 8 or more times daily. They were considered to have urgency if they reported difficulty postponing urination, had a strong urge to urinate (fairly often, usually or almost always) in the last month or a strong urge to urinate in the last 7 days (4 or more times). They were considered to have urge leakage if they reported 1 or more occasions when they "accidentally leaked urine in the last week when you had the strong feeling that you needed to empty your bladder but you could not get to the toilet fast enough."⁽²⁴⁾

The OAB-q that assess the subjective symptom based patients with or without continence. OAB-q consists of 8 items symptoms bother scale and 25 HRQL items that forms 4 subscales (that includes coping, concern, sleep, social interaction) and total HRQL score.⁽²⁵⁾

Although the prevalence of OAB increases with age, it is not a normal part of healthy aging. OAB is reported to affect 17% of adult women and 16% of adult men. Furthermore, OAB is a chronic condition

associated with a negative impact on health related quality of life.⁽²⁶⁾ OAB is burdensome to the individual, causing health-related quality-of-life, mental health, and sleep quality impacts; an increased risk of complications including urinary tract infection (UTI), skin rashes, and falls and impairments in activities of daily living, including the ability to work. Significantly higher rates of unemployment have been reported among working aged individuals with OAB compared to matched controls and OAB has been reported to negatively affect work productivity.⁽²⁷⁾

The incontinence may sometimes be classified under a different type based on the symptoms given by the patient and clinical evaluation performed. Since the symptoms may tend to be reported similarly for different types of incontinence, it becomes necessary to identify the exact type with different outcome measures. This study, therefore, aims at identifying the type of incontinence and the proportion of OAB using the QUID and OAB-q.

MATERIALS AND METHODS

PROCEDURE:

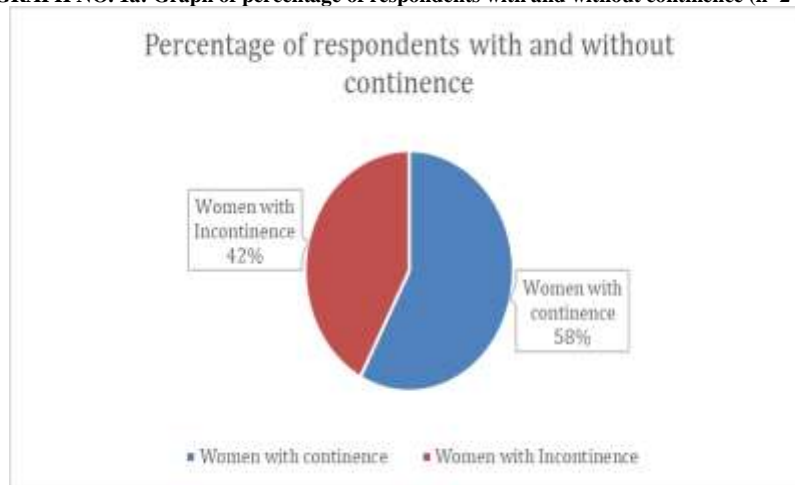
The study received clearance from the institutional ethics committee. It was carried out in the community with adult females between the age group of 18-55 years old over a period of 10 months. The participants were selected according to the inclusion and exclusion criteria, the study was explained to them, and written consent was obtained from them. The research information sheet and consent form were part of the e-form that was created to obtain the data. The other sections of the form were details of the patient, the QUID and OAB-q questionnaires. The form could be answered in English as well as Marathi, the vernacular language. The participant was invited to answer and submit the form once they understood the study and its implications. Participants were also given contact details to talk to the investigator in case they had any queries or needed further information.

A total of 243 individuals responded to the questionnaire. Data for these respondents was tabulated in Microsoft Excel. Scores for QUID and OAB-q were calculated. Individuals scoring more than 4 for SUI components, 6 for UUI components on the QUID were considered for the study. Thus, a total of 102 individuals' data was analysed further for the OAB-q. Those scoring 28 and

more on the OAB-q were considered to have OAB. Of the 102 respondents satisfying the UI criteria, 41 had SUI, 30 had UUI, and 31 had symptoms of both SUI and UUI. Proportion of OAB was calculated separately for each of these sub-groups. The descriptive analysis also was performed using Excel.

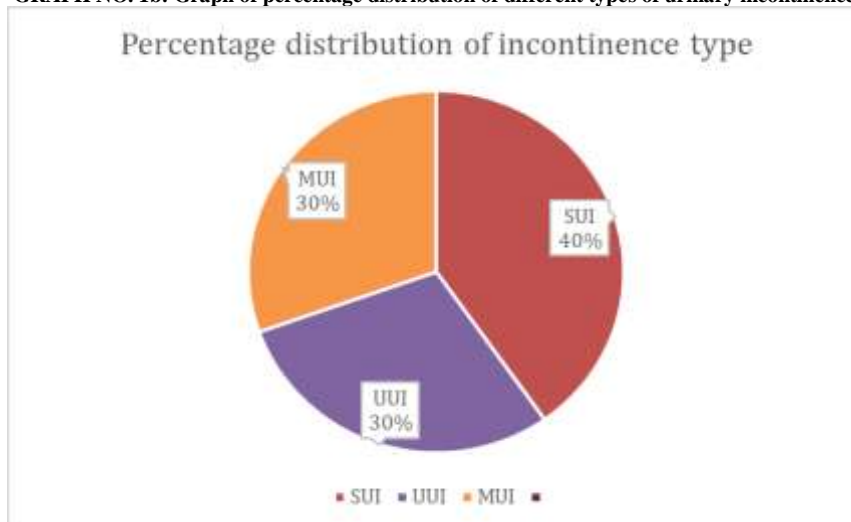
Data Analysis:

GRAPH NO. 1a: Graph of percentage of respondents with and without continence (n=240).



INFERENCE: Graph shows the percentage distribution of respondents into women with (58%) and without (42%) continence.

GRAPH NO. 1b: Graph of percentage distribution of different types of urinary incontinence.



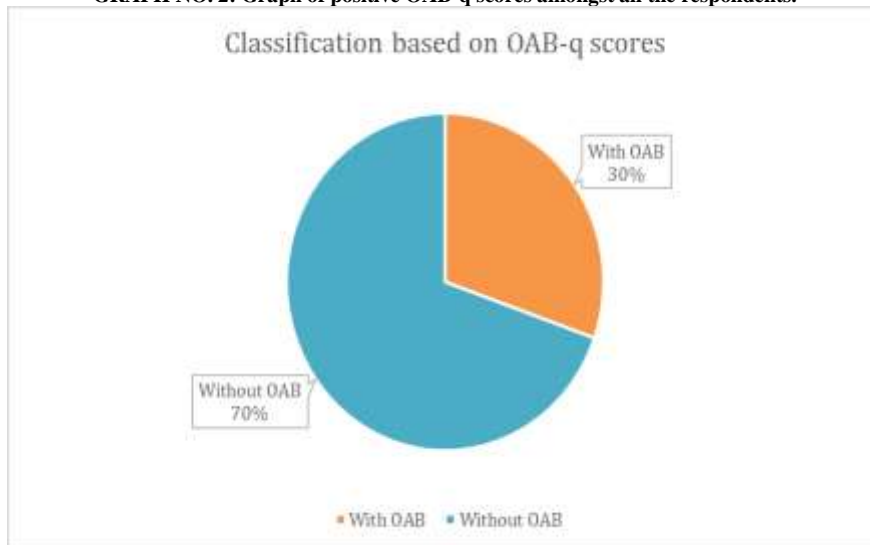
INFERENCE: The above graph shows percentage of participants with SUI (40%, N=41), UUI (30%, N=30) and MUI (30%, N=31).

TABLE NO. 1: Proportion of OABS symptoms amongst the different types of UI.

| Type of incontinence | N | Participants scoring more than 28 on the OAB-q | Proportion of OABS in Incontinence |
|----------------------|----|--|------------------------------------|
| SUI | 41 | 7 | 17.07% |
| UUI | 30 | 18 | 60% |
| Both SUI and UUI | 31 | 27 | 87.09% |

Secondary analysis:

GRAPH NO. 2: Graph of positive OAB-q scores amongst all the respondents.



INFERENCE: The above table and graph shows that 30% of the total population showed OAB symptoms.

RESULTS

Out of 243 of the total participants, 3 participants refused consent for data to be considered in this study. Out of 240 remaining samples collected, 102 participants' scores indicated that they had one or the other form of incontinence. Participants having urge urinary incontinence in the total incontinence population was 29.41% (30 individuals) whereas, stress incontinence (41 individuals) in the total population was 40.19%. Population with both types of incontinence was 30.39% (31 individuals).

Among participants scoring positively for incontinence, 52 showed symptoms of OABS. The highest proportion of OAB was in the mixed urinary incontinence group, with 87% showing OAB (N=27). In UUI, 60% participants showed OAB symptoms (N=18). In SUI, 17% participants showed OAB symptoms (N=7).

Out of the total 240 responses collected, the total number of participants having OAB was 73.

DISCUSSION

Urinary incontinence is defined as a condition in which there is an involuntary loss of urine, and is, many times, a social and hygienic problem. To thoroughly

comprehend the pathological processes which lead to the development of urinary incontinence, a proper understanding of normal mechanisms for the maintenance of continence is important.⁽⁴⁾

Normally, as a person's bladder slowly fills with urine, the bladder sends a signal to the brain that it needs to empty itself. This sensation starts out with a mild feeling of needing to empty when the bladder is only partly full. The sensation can reduce by itself and the pelvic floor activity will also contribute significantly to cause reflex inhibition of the detrusor and mechanically block the bladder motor activity. Voiding occurs once the bladder is filled to almost 400-500 ml, when the detrusor contracts, with a synergistic relaxation of the pelvic floor muscles, in a place deemed acceptable by the individual.

Any deviation in these parameters will be considered as incontinence. Stress urinary incontinence occurs when an increased intraabdominal pressure causes involuntary contraction of the detrusor leading to a leak. Urge incontinence occurs when the bladder wall is sensitive to neural signals and signals detrusor contraction when it perceives a stretch. When a person has OAB, she feels a strong, sudden urge to urinate throughout the day. In addition to an

increased urgency to urinate, people with OAB experience higher frequency. Sometimes, a person with OAB can experience urine leakage after an urge to void, which can be confused with incontinence. It is always characterized by symptoms of urinary urgency and increased urinary frequency.⁽¹⁷⁾ In OAB it is seen that there is relaxation of urethral sphincter during voiding, and dyssynergia of the detrusor and pelvic floor muscles. Uncontrolled contractions during bladder filling are responsible for the OAB symptoms. OAB can co-exist with other common conditions, such as stress incontinence or nocturnal polyuria (ICS 2018). Urodynamic studies are required to confirm the diagnosis of these conditions. Treatment options differ with the confirmation of the diagnosis.

Traditionally, female urinary incontinence has been described and divided in relation to physical exertion and/or the presence of the urge to void. There are numerous studies regarding the epidemiology of the overactive bladder and urinary incontinence in general. These conditions are among the most common health problems in women and frequently occur in men as well⁽⁴⁷⁾. Multiple studies on incontinence have concluded that this impairs patients functionality, with affected individuals obtaining less QOL scores as compared to healthy individuals⁽³⁵⁾. Urinary incontinence is a significant health problem in society leading to restriction in social and sexual activities and can affect the individual's psychology. It may also lead to affection of financial health, if it affects the individual's working capability. With worsening of the condition, the individual might also face social embarrassment, increased stress and, in severe cases, absenteeism, which can potentially lead to loss of job⁽⁴⁸⁾.

Issues related to incontinence are mainly revealed during pre-operative screenings for medical conditions like cancer or hysterectomy or when the individual seeks medical help. For women, their primary condition is, most of the times, compounded

with the added burden of simultaneously managing urinary incontinence symptoms. These women are likely focused on their chief complaints, unconsciously masking urinary incontinence symptoms. It is also likely that these women consider a complaint of incontinence as a normal course of the disease process or as embarrassing.

Women between 18 to 55, conversant in English and Marathi, and able to respond to an e-form of the questionnaires were included. The wide age range was selected to gather as much information as possible the various age groups. Previous studies have considered the older women, prompting the exclusion of those age groups here⁽⁴⁸⁾. In this study, pregnant females, females with a history of prolapse, acute urinary tract infections, and with any neurological conditions were excluded. In pregnancy, as the foetus grows and occupies more space in the abdominal cavity, there is increased pressure on the bladder, which temporarily causes incontinence. In 2007, Kari Bo stated that the prevalence of incontinence is more in females during pregnancy. This incontinence is also associated with weak pelvic floor strength, and mostly gets resolved in puerperium. According to Priscilla Lango, a study done in 2009 stated that individuals who underwent hysterectomy, especially total and subtotal abdominal surgeries, showed leakage as a risk factor or a post-operative complication due to medical interventions⁽³³⁾. Also, active urinary tract infections and neurological conditions, which showed aggravated urinary incontinence symptoms, were excluded⁽¹⁶⁾.

Of the scales that assess presence or absence of urinary incontinence, the QUID can differentiate between different incontinences, with a sensitivity of 85% and 71% respectively for SUI and UI, and a specificity of 79% for both conditions. The reliability of the scale is .85 and .87 respectively, for the stress and urge components. This scale helps to identify the effect of incontinence on the physical, and

social aspects, while also categorizing the type of incontinence as stress, urge or mixed incontinence⁽⁴⁵⁾. The first three items of the questionnaire focus on stress incontinence symptoms and the last three on urge incontinence symptoms. The questionnaire is divided into severity and condition specific questions, each item contributing towards the diagnosis or screening of the type of incontinence. QUID scores (Stress scores ≥ 4 for SUI and Urge scores ≥ 6 for UI), provide incontinence information more easily and in a shorter span of time⁽⁴⁵⁾. The Overactive Bladder Questionnaire (OAB-q) is a widely accepted tool to measure the OAB symptoms and health-related quality of life⁽⁴⁹⁾. OAB-q is a multidimensional instrument devised to examine an individual's perception of symptoms that bother them, or have an impact on their health-related quality of life. The OAB has an internal consistency coefficient of 0.76-0.94, and a test-retest reliability coefficient of 0.72-0.87⁽⁴²⁾. OAB-q assesses the subjective symptoms of patients with or without incontinence. It helps to identify the level of change in all symptoms of micturition.⁽²⁷⁾ OAB-q consists of an 8-item-symptoms bother scale, and 25 health-related quality of life items that form 4 subscales (coping, concern, sleep, social interaction) and total HRQL score.⁽²⁹⁾ In few of the studies, based on the older definition of OAB, there were prevalence estimates of OAB of 16% and 16.9% respectively, in men and women aged above 18 years⁽⁴⁸⁾. A study done in 2011 by Debra E Irwin et al predicted that, by 2018 there would be a 20.1% world-wide prevalence of OAB in adults aged ≥ 20 . They used the 2008 ICS definition of OAB in this study⁽³⁹⁾. In European countries, this was found to be 15.6% in men and 17.4% in women⁽²²⁾. The authors also noted that incontinence is common in adult females and can occur at any age⁽³⁹⁾. A study published in the Annals of Internal Medicine reported that females, even at an average age of 22 years, could have had an experience of OAB⁽³⁴⁾. Causes of OAB considered in that study ranged

from weak bladder muscle, irritation to the bladder, nerve damage, to a genetic predisposition to OAB.

By using the QUID in this study, categorization of participants into stress, urge or mixed incontinence was possible. With the OAB-q, presence, or absence, of OAB could be confirmed. The major analysis of the study, the identification of proportion of OAB amongst participants suffering from UI, was, hence, possible. In this study, 243 females responded to the QUID and OAB-q questionnaires. Of the 243 females, 3 refused consent for the analysis, and were excluded from the study. Of the 240 participants, 41 had SUI, 30 had UI and 31 had mixed incontinence (Table 1 and graph 1b). The present study found an incontinence prevalence of 42.5%, which is equivalent to prevalence in other countries (5 to 70%)⁽³¹⁾. Prevalence estimates were highly dependent on age and gender. The European Prospective Investigation into Cancer and Nutrition (EPIC) study, done in 2006 by Irwin DE, Milsom I, Hunskaar S, is the largest study to report population-based prevalence rates of OAB and UI in 5 different countries⁽³⁹⁾. It found that 8.7% women had one or the other type of incontinence. A studied of the prevalence of UI in a large cohort of nonpregnant, nulliparous women aged 25-64 years, where they found an overall prevalence of 16.7% of UI⁽⁴⁸⁾.

The occurrence of symptoms alone does not help to identify the condition; a perceived impact on an individual also needs to be considered. Urine leak has largely been associated with stress or urge incontinence, which may not always be the accurate diagnosis. This justifies the main aim of this study, which was to identify the proportion of females suffering from OAB amongst the three incontinences that are identified by QUID. OAB-q scores were used as the criterion to diagnose OAB. This scale has also shown a strong discriminatory power between continent and incontinent OAB⁽⁴⁹⁾. After classifying the females under various urinary incontinences, further categorisation

was performed based on their OAB-q scores, and the proportion of OAB in that incontinence group was identified (Table 2 and Graph 2). Of the 240 respondents, 73(30.41%) females showed symptoms of OAB, irrespective of incontinence status.

30 females identified with UUI, with 18 (60%) showing symptoms of OAB. Clinically, the patient with urge urinary incontinence, may have uninhibited detrusor contractions, hypersensitive bladder or small capacity bladder, which causes sensory urge bladder. Indeed, urge has many causes and uninhibited detrusor contractions is only one of them. It is not to be considered synonymous with uninhibited detrusor contractions and one should also not assume that patients with uninhibited detrusor contractions will have urge UI. The local causes of urge UI includes abnormalities in bladder and urethra. But a very common reason for urge UI is inflammation that may be related to infections or presence of foreign bodies.⁽⁵⁰⁾

Similarly, 7 (17.07%) of the 41 participants having SUI, had OAB. Increased intra-abdominal pressure, in any form, leads to involuntary leakage in SUI. A behavioral adaptation in the stress incontinent woman is to empty her bladder more frequently to reduce the leakage, thus inducing frequency and, later on, urgency that is strongly associated with OAB. Thus, there might be a gradual development of OAB symptoms in women suffering from SUI. Here, again, there is a need to clarify the primary cause of incontinence, prior to starting a rehabilitation protocol for either SUI or OAB.

27 (87.08%) of the 31 participants having mixed urinary incontinence, showed OAB-q scores suggestive of OAB. The pathophysiology of MUI is complicated because it intertwines pathophysiologies of SUI and UUI. MUI involves several factors that may be responsible for its development, which include striated muscle atrophy, estrogen deficiency, abnormalities in muscle, histomorphologies, and microstructural changes.⁽⁵¹⁾ Biochemical

factors that are responsible for its development include decreased vaginal collagen content, increased vaginal messenger RNA matrix metalloproteinase, and increased collagen breakdown.⁽⁵¹⁾ Individuals suffering from this incontinence constantly have urine present in the urethra, which may act as a stimulus to aggravate or possibly initiate detrusor hyperactivity.⁽⁵¹⁾ This causes unintentional loss of urine, resulting in bladder muscle contractions, that causes urgency. This needs to urinate mimics that observed due to an overactive bladder.

A study done in 2004 by Pia M Telaman, showed that OAB was independently associated with abnormal metabolic factors but not with lifestyle factors such as smoking or alcohol consumption. OAB mimics both stress and urge urinary incontinence.⁽⁵²⁾ OAB and UI both involve issues of bladder function, but the two conditions are different from each other. The symptoms of urinary incontinence and OAB are very common and therefore can mask each other. In OAB there is increased intravesical pressure that mimics the symptoms of urge incontinence with or without sensation. The increased intravesical pressure overcomes the urethral resistance leading to a sensation of urgency; this is caused due to uninhibited detrusor contractions.⁽⁵⁰⁾ Suprapontine lesions can lead to detrusor hyperreflexia, a condition with uninhibited detrusor contractions. Hyperreflexia can also be caused by sacral plexus lesion, that may occur with or without dyssynergia. A constantly increased intravesical pressure results in decreased accommodation to bladder filling, which in turn leads to decrease in compliance of the bladder. This pattern of bladder dysfunction mimics urge incontinence. Here, a reduced bladder compliance leads to a false sensation of bladder filling, which triggers the detrusor contractions, leading to a loss of volume. It is always a clinical confusion because of an abnormality in sensation, the individual loses urine as a result of true motor activity on bladder without the

symptom of 'urge'. Conversely, frequency and urgency may be the result of phasic detrusor activity (low level motor activity of the bladder consistent with an organ composed of smooth muscle) or true contraction, but without actual urinary loss suggesting sensory urgency. The detrusor sensory and motor overactivity may coexist. This may result in misdiagnosing as urge urinary incontinence or OAB.

Stress incontinence is usually regarded as a consequence of insufficiency in the pelvic floor and urethral striated sphincter. The symptom described by the individual is urine leakage but the etiology of leakage actually defines the type of incontinence.⁽⁵²⁾ The uninhibited bladder contraction is stimulated by a stress manoeuvre but is mistakenly identified as urge urinary incontinence or OAB.⁽⁵⁰⁾ This generally occurs due to a decreased urethral resistance from poor anatomic support of the bladder neck, and a low urethral closure pressure. Either of these conditions can manifest individually or in combination with each other.⁽⁵⁰⁾

From the present results using the QUID and OAB-q as the two clinical assessment tools, we identified that out of 240 females, 73 (30.41%) of the females suffered from OAB with or without incontinence. Out of 102 females diagnosed with incontinence, 52 showed the symptoms of OAB. The two outcome measures helped to identify the incontinence and also classify its types. The study thus, underlines the need to identify diagnosis correctly. This, in turn, will help the clinician to guide the females, educate them about the conditions, empower the female to overcome the condition with apt treatment, and enhance the female's quality of life. Determination of a patient's medical history is not only vital for assessing genitourinary history, but also comorbidities, which may affect treatment options. Looking at full patient profiles, rather than just their symptoms, could aid treatment choice and, importantly, allow treatment to be individualized to each patient's needs.⁽¹⁷⁾

The present study had three main strengths: it was a community-based study, secondly, it was a cross-sectional study, and thirdly, the present study's purpose helped us identify females affected by urinary incontinence from 2 different perspectives; their incontinence status and a further categorisation of the incontinence based on the OAB-q.

Adult females have many demands on their physical, psychological, familial, social and financial statuses. Any additional demands placed on the female will increase the burden on her. It has been theorised that the demand on health care services and specific diagnosis of UI are expected to increase in the future, due, in part, to an aging population.⁽¹¹⁾ In such a situation, appropriate identification of incontinence, and consequently its treatment, is a must.

Therefore, awareness of different types of incontinence is necessary. OAB or UI is not a normal part of getting older. It is not a part of being a woman. Proper screening of different symptoms and conditions is a requirement. As females might be underreporting symptoms due to lack of awareness, embarrassment, or accepting it as a part of aging, there is a strong need to clinically identify and differentiate the diagnoses.

CONCLUSION

42% of the participants had UI. Of these, 51% had OAB. 17% women has SUI and OAB, 60% and UI and OAB, and 87% showed MUI and OAB. This study showed that mixed urinary incontinence had a higher proportion of OAB.

CLINICAL IMPLICATIONS:

Apt diagnosis is required when considering urinary incontinence, especially when there is presentation of MUI. Hence, further evaluation of females presenting with MUI and OAB should be considered.

LIMITATIONS:

- This study was limited by its sampling technique, as it was purposive sampling.

- Due to e-forms the study has been restricted to only populations using mobile phones or laptop.

FUTURE SCOPE:

- This study can be done by using urodynamic assessment outcomes.
- This study can be done for male population of same or different age groups.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Brubaker L and Sand P K. Cystometry, urethrometry and video cystourethrography. *Clin Obs Gynecol.* 1990;33(2):315.
2. Margaret Polden and Jill Mantle. *Physiotherapy in Obstetrics and Gynaecology.* 2004; 2nd edition iv–iv.
3. Norton P, Brubaker L. Urinary incontinence in women. 2006;367.
4. Ash monga and Abdul H. Sultan. *Mechanics of Continence.* 2011. 28–31 p.
5. Bharucha AE, Blandon RE, Lunniss PJ, Scott SM. *Anatomy and physiology of continence. Fecal Incontinence Diagnosis Treat.* 2007;3–12.
6. Bardsley A. An overview of urinary incontinence. *British Journal of Nursing,* 2016, Vol. 25, No. 18; S14-S21.
7. Fong E, Nitti VW. Urinary Incontinence. *Prim Care Clin Off Pract [Internet].* 2010;37(3):599–612. Available from: <http://dx.doi.org/10.1016/j.pop.2010.04.008>
8. Sapsford R, Bullock Saxton J, Markwell S. *Women's Health: A Textbook for Physiotherapists.* WB Saunders, 1998. 348–367 p.
9. Swithinbank L V., Donovan JL, Du Heaume JC, Rogers CA, James MC, Yang Q, et al. Urinary symptoms and incontinence in women: Relationships between occurrence, age, and perceived impact. *Br J Gen Pract.* 1999;49(448):897–900.
10. Lee KS, Choo MS, Seo JT, Oh SJ, Kim HG, Ng K, et al. Impact of overactive bladder on quality of life and resource use: Results from Korean Burden of Incontinence Study (KOBIS). *Health Qual Life Outcomes [Internet].* 2015;13(1):1–8. Available from: <http://dx.doi.org/10.1186/s12955-015-0274-9>
11. Wu JM, Stinnett S, Jackson RA, Jacoby A, Learman LA, Kuppermann M. Prevalence and incidence of urinary incontinence in a diverse population of women with noncancerous gynecologic conditions. *Female Pelvic Med Reconstr Surg.* 2010;16(5):284–9.
12. Janssen TL-. urinary incontinence in women and effects on their lives. *scand Prim Heal care J.* 1992;10(3):211–6.
13. Rose D. *medical news today. Chronic urinary tract infection.* 2018.
14. Panesar K. drug-induced urinary incontinence. *US pharm.* 2014;39(8):24–9.
15. D.C.Dutta. *textbook of gynaecology.* Hiralal Konar. 6th edition; 2008. 376–399 p.
16. Meerios Washington Luiz Gomes D urinary tract infection in patients with multiple sclerosis. *Mult Scler Relat Disord.* 2020;46(10):24–62.
17. Coyne KS, Matza LS, Kopp Z, Abrams P. The Validation of the Patient Perception of Bladder Condition (PPBC): A Single-Item Global Measure for Patients with Overactive Bladder. 2006;49:1079–86.
18. Hoffman V, Söderström L, Samuelsson E. Self-management of stress urinary incontinence via a mobile app: two-year follow-up of a randomized controlled trial. *Acta Obstet Gynecol Scand.* 2017;96(10): 1180–7.
19. Liebergall-Wischnitzer M, Paltiel O, Hochner-Celnikier D, Lavy Y, Manor O, Woloski Wruble AC. Sexual Function and Quality of Life for Women with Mild-to-Moderate Stress Urinary Incontinence. *J Midwifery Women's Heal.* 2011;56(5):461–7.
20. Hagovska M, Švihra J, Buková A, Dračková D, Švihrová V. Prevalence and risk of sport types to stress urinary incontinence in sportswomen: A cross-sectional study. *Neurourol Urodyn.* 2018;37(6):1957–64.
21. Bradley CS, Rahn DD, Nygaard IE, Barber MD, Nager CW, Kenton KS, Siddiqui NY, Abel RB, Spino C RH. The questionnaire for urinary incontinence diagnosis (QUID): validity and responsiveness to change in women undergoing non-surgical therapies for treatment of stress predominant urinary

- incontinence. *Neurourol Urodyn.* 2010; 29(5): 727–34.
22. Palmer SJ. Urge incontinence in postmenopausal women. *Br J Community Nurs.* 2020;25(4):168–72.
 23. Perry S, Mcgrother CW, Turner K. An investigation of the relationship between anxiety and depression and urge incontinence in women : Development of a psychological model Copyright © The British Psychological Society. 2006;463–82.
 24. Wyman JF, Burgio KL, Newman DK. Practical aspects of lifestyle modifications and behavioural interventions in the treatment of overactive bladder and urgency urinary incontinence. 2009;(August):1177–91.
 25. Wood LN, Markowitz MA, Parameshwar PS, Hannemann AJ, Ogawa SL, Anger JT, et al. Is it Safe to Reduce Water Intake in the Overactive Bladder Population? A Systematic Review. *J Urol [Internet].* 2018;200(2):375–81. Available from: <https://doi.org/10.1016/j.juro.2018.02.3089>
 26. Coyne KS, Matza LS, Thompson CL. The responsiveness of the Overactive Bladder Questionnaire (OAB-q). *Qual Life Res.* 2005;14(3):849–55.
 27. Elisabeth Piau, Christopher Evans and Zoe Kopp. development and validation of the overactive bladder satisfaction questionnaire. *Neurourol Urodyn.* 2008;27: 179–90.
 28. Powell LC, Szabo SM, Walker D, Gooch K. The economic burden of overactive bladder in the United States: A systematic literature review. *Neurourol Urodyn.* 2018;37(4):1241–9.
 29. Link CL, Steers WD, Kusek JW, McKinlay JB. The Association of Adiposity and Overactive Bladder Appears to Differ by Gender : Results From the Boston Area Community Health Survey. *J Urol [Internet].* 2011;185(3):955–63. Available from: <http://dx.doi.org/10.1016/j.juro.2010.10.048>
 30. Chen, Yun; Liu, Yingqiu and Dorn G 2011. NIH Public Access. *Bone.* 2011;23(1):1–7.
 31. Matza LS, Thompson CL, Krasnow J, Brewster-jordan J, Zyczynski T, Coyne KS. Test-Retest Reliability of Four Questionnaires for Patients with Overactive Bladder : The Overactive Bladder Questionnaire (OAB-q), Patient Perception of Bladder Condition (PPBC), Urgency Questionnaire (UQ), and the Primary OAB Symptom Questionnaire. 2005;225(May 2004).
 32. Steers WD. Pathophysiology of Overactive Incontinence. 2002;4:7–18.
 33. Milsom I, Gyhagen M. The prevalence of urinary incontinence. *Climacteric [Internet].* 2019;22(3):217–22. Available from: <https://doi.org/10.1080/13697137.2018.1543263>
 34. Minassian VA, Stewart WF WG. urinary incontinence in women: variation in prevalence estimates and risk factors. *Obs GYNECOL.* 2008;111:324–31.
 35. Kruse AR Jensen T. Changes in incontinence after hysterectomy. *arch gynecol Obs.* 2017;294(4):783–90.
 36. Shy M, Fletcher SG. Objective Evaluation of Overactive Bladder: Which Surveys Should I Use? *Curr Bladder Dysfunct Rep.* 2013;8(1):45–50.
 37. Bartoli S, Aguzzi G, Tarricone R. Urinary Incontinence and Overactive. URL [Internet]. 2010;75(3):491–500. Available from: <http://dx.doi.org/10.1016/j.urology.2009.07.1325>
 38. Baessler K, Neill SMO, Maher CF, Battistutta D. A validated self-administered female pelvic floor questionnaire. 2010;163–72.
 39. Drake MJ, Kanai A Bijos DA. the potential role of unregulated autonomous bladder micromotions in urinary storage and voiding dysfunction: overactive bladder and detrusor underactivity. *BJU INT.* 2017;119(4).
 40. Leron E, Weintraub AY, Mastrolia SA, Schwarzman P. Overactive Bladder Syndrome: Evaluation and Management. *Curr Urol.* 2018;11(3):117–25.
 41. Irwin DE, Kopp ZS, Agatep B, Milsom I, Abrams P. Tract Symptoms , Overactive Bladder , Urinary Incontinence and Bladder Outlet Obstruction. *BJU Int.* 2011;108: 1132–9.
 42. Homma Y, Yoshida M Seki N. Symptom assessment tool for overactive bladder syndrome. *Urology.* 2006;68(3):318–23.
 43. Coyne K, Revicki D, Hunt T, Corey R, Stewart W, Bentkover J, Kurth H AP. Psychometric validation of an overactive bladder symptom and health-related quality of life questionnaire: the OAB-q. *Qual Life Res.* 2002;11(6).

44. Paul Abrams, MD; C.J. Kelleher, MD, MRCOG; Lindsey A. Kerr, MD; and Rebecca G. Rogers M. Overactive Bladder Significantly Affects Quality of Life. *Am J Manag Care*. 2000;
 45. Derek Griffith S. Bladder control, urgency, and urge incontinence: Evidence from functional brain imaging. *Neurol Urodyn*. 2008;27(6).
 46. Cavkaytar S, Kokanali MK, Topcu HO, Aksakal OS, Doğanay M. Effect of home-based Kegel exercises on quality of life in women with stress and mixed urinary incontinence. 2014;1–4.
 47. Arya R, Antonisamy B KS. Sample size estimation in prevalence studies. *Indian J Pediatr*. 2012;79(11):1482–8.
 48. Chen G Den, Lin TL, Hu SW, Chen YC, Lin LY. Prevalence and correlation of urinary incontinence and overactive bladder in Taiwanese women. *Neurourol Urodyn*. 2003;22(2):109–17.
 49. Agarwal BK, Agarwal N. Urinary incontinence: prevalence, risk factors, impact on quality of life and treatment seeking behaviour among middle aged women. *Int Surg J*. 2017;4(6):1953.
 50. Alain Bourcier, Edward Mcguire Paul Abrams. *Pelvic Floor Disorder*. Elsevier Saunders. 2004. 43–48 p.
 51. Chughtai B, Laor L, Dunphy C, Lee R, Te A, Kaplan S. Diagnosis, Evaluation, and Treatment of Mixed Urinary Incontinence in Women. *Rev Urol*. 2015;17(2):78–83.
 52. Teleman PM, Lidfeldt J, Nerbrand C, Samsioe G MA. Overactive bladder: prevalence, risk factors and relation to stress incontinence in middle-aged women. *BJOG*. 2004;111(6):600–4.
- How to cite this article: Juilee Khadke, Abha Dhupkar. Prevalence of overactive bladder syndrome among adult females having stress urinary incontinence and urge urinary incontinence using overactive bladder syndrome questionnaire. *Int J Health Sci Res*. 2023; 13(3):55-68.
DOI: <https://doi.org/10.52403/ijhsr.20230306>
