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Research Article

Risk Estimation and Stratification of Urinary Incontinence: Its Determinants and Quality of Life in Indian Females - A Cross-sectional Study

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I N F O

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A B S T R A C T

Introduction: The International Continence Society defined urinary incontinence (UI) as "involuntary loss of urine which is deleterious and causes social embarrassment and creates negative self-perception in females". India has a 21.8% prevalence of UI which increases with age.

Methods: A community-based study was conducted using a self-structured and validated questionnaire at the Outpatient Department of a tertiary healthcare hospital from October 2020 to January 2021 for females between 35 and 65 years of age. 182 females who visited the hospital underwent preliminary screening for any complaints related to occasional or repeated problems of urinary leakage, and those who reported concern were further interviewed in detail with the self-structured questionnaire.

Results: Descriptive statistical analysis was performed to estimate the proportion of each category of the respective groups. 28.02% of the study population belonging to the age group of 35 to 65 years was found to have UI. Regression analysis estimated that females with vaginal deliveries (> 3), diabetes (random blood sugar level above 120 mg/dl), chronic cough more than 6 months, constipation, and lower urinary tract infection, exhibit greater odds of having UI.

Quality of life assessment was performed incorporating King's quality of life questionnaire which showed that the urinary incontinence impact decreased the general health of females and caused limitations to physical functions as well as psychological well-being which may lead to emotional and sleep disturbances.

Conclusions: Females with higher BMI, normal vaginal deliveries, and lower urinary tract infections can lead to urinary incontinence and worsen quality of life.

Keywords: International Continence Society, Normal Vaginal Deliveries, Urinary Incontinence, Lower Urinary Tract Infection, Kings Health-Related Quality of Life Questionnaire

Introduction

Urinary incontinence (UI) is a common but often under-reported medical condition with a significant impact on one's quality of life (QoL). The International Continence Society defined UI as "involuntary loss of urine which is deleterious and causes social embarrassment and creates negative self-perception in females". [1] India has a 21.8% prevalence of UI which increases with age.[1] Norton and Brubaker stated that incontinence is the most common condition among women and it has not been given much priority.[2] Singh et al. mentioned that the prevalence of UI increases with age globally. It affects 7% of people in the age group of 20–39 years, 17% in the age group of 40–59 years, 23% in the age group of 60–79 years, and 32% of people who are above 80 years of age.[3]

The lack of ability to hold urine is displeasing. Although it does not lead to emergencies, it causes a notable change in health, social isolation, and psychological stress that might result in the degradation of the quality of life. Many females are too conscious to discuss their problem and some believe it to be unpreventable.[4,5] Many studies on UI have been conducted in various other countries with considerable study participants. India has limited studies, including urban as well as rural females, with different socioeconomic statuses. The issue is often undisclosed, as a significant number of women do not proactively seek assistance or provide detailed explanations of their symptoms to medical professionals due to a lack of health education, embarrassment, and cultural limitations imposed on females.

Stress UI is the involuntary loss of urine occurring during physical activities which lead to exertion and an increase in the abdominal pressure causing the intra-vesicle pressure to rise more than the maximum urethral pressure leading to descent of the bladder and involuntary voiding. In India, there are limited studies reported on various direct and indirect risk factors of UI. These factors might impact health as well as the quality of life of an individual. This study has evaluated the possible associated risk factors, quality of life, and treatment attitude of females towards UI.

Materials & Methods

A prospective cross-sectional study was conducted from October 2020 to January 2021 in the Outpatient Department (OPD) of a multi-centric hospital in Pune, India. Ethical clearance was acquired from the Institutional Ethics Committee.

Females aged between 35 and 65 years who visited the hospital were inquired about symptoms of urinary leakage while doing activities with or without urgency and those who answered "yes" were included in the study for further evaluation. The study purpose was described to all participants and their consent was taken. During data collection, their confidentiality was maintained.

One hundred and eighty-two females participated in this study. A self-administered questionnaire was created to gauge the degree of urinary incontinence symptom severity and functional status. It covered areas such as intensity of urinary leakage, discomfort, everyday activities, leisure and work, contentment, and areas for development. The final score was calculated by weighting the individual grades for each domain. The study prospectively assessed the validity, reliability, and responsiveness to clinical change of both the overall scale and each individual domain. Accordingly, the study included 182 participants who had been examined for symptoms of urinary incontinence using the King's Health Questionnaire (KHQ).

The questionnaire was distributed among the females who agreed to participate in the study. Demographic details and information regarding various risk factors of UI like BMI, parity, mode of delivery normal vaginal delivery (NVD) or lower segment caesarean section (LSCS), any history of prolonged labour, socioeconomic status of the female, history of medication of diabetes, hypertension, chronic cough, and chronic constipation were filled by the participants along with KHQ.

In this study, KHQ was used to assess the quality of life of female participants. It assesses the impact of urinary incontinence on various domains of the quality of life of individuals, as well as the symptoms perceived by them. The International Continence Society (ICS) classifies it as "highly recommended", or "A" level, for use in clinical research, mainly because of its availability in various languages. It has a set of questions to evaluate the influence of UI on the quality of life.

This tool consisted of three parts and nine domains based on a) Part I - General health perceptions and incontinence impact (1 item each), b) Part II - Role limitation, physical limitation, and social limitation along with sleep and energy domain (2 items each); personal relationships and emotions domain (3 items each); severity measures domain (5 items), and c) Part III included the bladder problems and the extent to which they affected the individual (11 items). The domains were described as general health perception, incontinence impact, role limitations, physical and social limitations, personal relationships, emotions, sleep/ energy, and severity coping measures. To evaluate the symptom severity perception, nine questions were added to an independent scale. Scores for each domain were calculated through a method that managed missing values and the results ranged from 0 to 100, with higher scores indicating a more impaired QoL. ROC curves established the cut-off score at ≤ 31 for the respective domain.[6]

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Data were analysed using statistical software (SPSS 22.0 Inc., Chicago, IL) with a level of significance as $p < 0.05$. Descriptive statistics were utilised to assess the proportion of each category of the respective groups. Variables were set up in the logistic regression model to estimate the risk. Pearson correlation was also used to estimate the correlation coefficient. Significant variables were entered into multiple logistic models by the forced entry method. The relationship was assessed by odds ratio (OR) at a 95% confidence interval.

Results

The study participants were between the ages of 35 and 65 years. The mean age of the study participants was 48.53 (SD ± 9.15) years. Almost 36.8% of females had diabetes while 25.8% had high blood pressure Table 1. Nearly 8.8% of the subjects had a history of gynaecological operations. 92.3% of females had a normal vaginal delivery (NVD) while 23% had a hysterectomy; 23.7% had a history of abortion and 17% had a history of prolonged labour. Among the participants, 10.4% were suffering from lower urinary tract infections Table 2. Fifty-one (28.02%) out of 182 women were found to have UI.

Table 1.Demographic Characteristics of Study Participants

Variables	Patients With and Without UI N = 182	
	n (%)	Median (IQR)
Age (in years)		
35-45	69 (37.91)	46 (43–48)
46-55	76 (41.75)	
56-65	37 (20.32)	
BMI		
18.5-24.9	31 (17.03)	30.32 (28.19-35.78)
25.0-29.9	84 (46.15)	
≥ 30.0	67 (36.81)	
Educational level		
Below primary	17 (9.30)	Educational level range (1-12)
Primary	34 (35.40)	
Secondary	39 (21.40)	
Higher secondary	38 (20.90)	
Illiterate	14 (7.70)	
Literate	40 (1.90)	
Socio-economic status*		
Upper	0 (0.00)	-
Upper-middle	47 (25.80)	
Lower-middle	92 (50.50)	
Upper-lower	23(12.60)	
Lower	20 (11.00)	
Mode of delivery		
FTND	169 (93.88)	-
LSCS	13 (7.12)	-
Associated medical illness		
Chronic cough	27 (37.22)	-
Obesity	109 (60.55)	-

*According to the Modified Kuppuswamy Scale 2021
BMI: Body mass index, IQR: Interquartile range, FTND: Full-term normal delivery, LSCS: Lower segment caesarean section

Table 2.Distribution of Study Participants According to Some Known Risk Factors of Urinary Incontinence (N = 182)

Variables	n (%)
Parity	
< 3	158 (86.8)
> 3	24 (13.2)
History of prolonged labour	
Yes	31 (17.0)
No	151 (83.0)
LSCS	
Yes	18 (90.1)
No	164 (9.9)
FTND > 3 children	
Yes	19 (7.7)
No	163 (92.3)
Lower urinary tract infection	
Yes	19 (10.4)
No	163 (89.56)
History of gynaecological surgery	
Yes	16 (8.8)
No	164 (92.3)
History of chronic cough	
Yes	21 (11.5)
No	161 (88.5)
History of chronic constipation	
Yes	20 (10.5)
No	162 (89.5)
History of diabetes	
Yes	67 (36.8)
No	115 (63.1)
History of hypertension	
Yes	47 (25.8)
No	135 (74.2)

LSCS: Lower segment caesarean section, FTND: Full-term normal delivery

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Only 42.9% shared their problems with anyone and took treatment for UI. Mostly they shared their UI problems with their spouses and doctors. The most common reason for not taking medical help was poor financial condition (70.5%), followed by hesitation (55.8%). Sixteen (47.1%) of them took it as a normal change due to ageing whereas, eight of them did not attend the hospital due to apprehension about investigation and treatment. Almost 14.7% of the respondents believed that UI had no treatment.

During analysis, bivariate logistic regression was performed. Illiterate study participants with a history of long hours of labour, gynaecological surgery, full-term normal delivery (> 3), diabetes, chronic cough (more than 2 months), constipation, and lower urinary tract symptoms (LUTS) had significantly higher odds of UI. BMI (OR: 1.25 [1.23–2.10], Normal Vaginal delivery NVDs (OR: 1.24 [1.02–1.44]), a history of gynaecological surgery (OR: 2.34 [1.33–2.98]), chronic cough for more than six months (OR: 1.77 [0.56–1.89]), and LUTS (OR: 1.24 [0.78–1.23]) prevailed to be significant when adjusted with another significant variable in the bivariate analysis (Table 3).

Table 3.Univariate Analysis using Logistic Regression for Subjects (With and Without UI)

Risk Factors	OR	Lower Limit	Upper Limit	p Value
Diabetes	1.56	0.89	1.35	0.670
Hypertension	1.26	0.56	1.14	0.490
Chronic cough	1.77	0.56	1.89	0.340
Constipation	0.85	0.44	1.24	0.430
History of gynaecological surgery	2.34	1.33	2.98	0.02*
FTND	1.24	1.02	1.44	0.04*
LSCS	0.89	0.78	1.24	0.130
Prolonged labour	1.02	0.88	1.46	0.330
LUTS	1.24	0.78	1.23	0.540
History of abortion	1.10	0.86	1.43	0.780
Parity	1.25	0.78	0.56	1.260
BMI	1.87	1.23	2.10	0.001*

*FTND: Full-term normal delivery, LSCS: Lower segment caesarean section,
LUTS: Lower urinary tract infection, BMI: Body mass index, OR: Odds ratio
Negelkerke R2: -0.308, Hosmer Lameshow :- 0.876

Fifty-one females who had urinary incontinence were evaluated with KHQ. UI showed a reduction in general health (56.66 ± 22.49), urinary incontinence impact (62.16 ± 17.21), role limitation (64.4 ± 18.75), physical limitations (62.88 ± 24.00), social limitation (35.96 ± 24.14), relationship with spouse (58.85 ± 28.05), emotion (65.12 ± 25.14), sleep/ energy loss (54.4 ± 20.37), severity measures taken (55.52 ± 23.08), and severity symptoms (13.0 ± 6.25) (Table 4).

Table 4.Description of King's Health-related Quality of Life of Females with UI (N = 51)

S. No.	KHQ Domains	Mean ± SD Values
I	General health	56.66 ± 22.49
II	Incontinence impact	62.16 ± 17.21
III	Role limitations	64.40 ± 18.75
IV	Physical limitations	62.88 ± 24.00
V	Social limitations	35.96 ± 24.14
VI	Relationships	58.85 ± 28.05
VII	Emotions	65.12 ± 25.14
VIII	Sleep/ energy	54.40 ± 20.37
IX	Severity measures	55.52 ± 23.08
X	Severity of symptoms	13.00 ± 6.25

KHQ: King's Health Questionnaire

Discussion

28.02% of the study population belonged to the age group of 35–65 years and were found to suffer from UI. Studies published by Ansar et al. (23.9%),[7] Seshan and Muliira (33.8%),[8] Prabhu and Shanbhag (25.5%),[9] Kılıç (37.2%),[10] and Sensoy et al. (44.6%)[11] have reported more whereas, Singh et al. (21.8%),[12] Ge et al. (22.1%),[13] Sumardi et al. (13.0%),[14] Abiola et al.(12.6%),[15] and Bodhare et al. (10.0%)[16] have shown fewer symptoms and their findings were similar to those of the present study. The rate of prevalence of UI may differ for each study because of the definition of UI used during the assessment of different study populations and settings.

The occurrence of UI increases with advancing years of life due to a reduction in muscle tone, reduced contractility, changes in hormonal excites, and recurrent injuries during every delivery. The study published by Saadia et al. explained that females with high parity, who experienced more than 2 normal vaginal deliveries and who had gynaecological surgeries had a higher risk of urinary incontinence.[17] Parity is linked with an increased risk of stress UI.

Perineal trauma during childbirth creates an impact on the pelvic floor muscle which disturbs the continence mechanism.[18] However, UI also depends on the type of delivery and the complications that occur during normal vaginal delivery such as obstructed labour, which may cause perineal damage.[19]

In the present study, females with diabetes were found to have more symptoms of urinary incontinence. Also,

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females with high blood sugar levels were observed to have increased urine volume and detrusor over-activity. The vascular manifestations of diabetes may harm the innervation of the bladder and alter detrusor muscle function leading to overflow incontinence.[20] Females with hypertension who took medications like diuretics and alpha blockers had a higher frequency of urinary urgency as well as urinary leakage.[21] As obesity increases, fat accumulation and increase in abdominal thickness further elevate intra-abdominal pressure and imbalance intra-vesicle pressure causing urethral instability, thereby leading to UI.

The presence of urine incontinence (UI) characterised by increased urinary frequency, nocturnal episodes, and urgency has been observed to result in decreased scores in many areas of KHQ among a significant number of women. These domains include physical and household activities, social interactions, sleep quality, and overall energy levels.

Conclusion

UI is a bothersome condition and is highly prevalent with various risk factors like increased parity, BMI, etc. As the symptoms of UI increase, the study reported a reduction in quality of life including personal as well as social limitations. Hence it is necessary to educate women about the condition, its consequences, and the available conservative treatment.

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References

1. Abrams P, Andersson KE, Birder L, Brubaker L, Cardozo L, Chapple C, Cottenden A, Davila W, de Ridder D, Dmochowski R, Drake M, Dubeau C, Fry C, Hanno P, Smith JH, Herschorn S, Hosker G, Kelleher C, Koelbl H, Khoury S, Madoff R, Milsom I, Moore K, Newman D, Nitti V, Norton C, Nygaard I, Payne C, Smith A, Staskin D, Tekgul S, Thuroff J, Tubaro A, Vodusek D, Wein A, Wyndaele JJ; Members of Committees; Fourth International Consultation on Incontinence. Fourth International Consultation on Incontinence Recommendations of the International Scientific Committee: evaluation and treatment of urinary incontinence, pelvic organ prolapse, and fecal incontinence. Neurourol Urodyn. 2010;29(1):213-40. [PubMed] [Google Scholar]
2. Norton P, Brubaker L. Urinary incontinence in women. Lancet. 2006;367(9504):57-67. [PubMed] [Google Scholar]
3. Singh U, Agarwal P, Verma ML, Dalela D, Singh N, Shankhwar P. Prevalence and risk factors of urinary incontinence in Indian women: a hospital-based survey. Indian J Urol. 2013;29(1):31-6. [PubMed] [Google Scholar]
4. Pintos-Díaz MZ, Alonso-Blanco C, Parás-Bravo P, Fernandez-de-Las-Penas C, Paz-Zuluets M, Fradejas-Sastre V, Palacios-Cena D. Living with urinary incontinence: potential risks of women's health? A qualitative study on the perspectives of female patients seeking care for the first time in a specialized center. Int J Environ Res Public Health [Internet]. 2019 [cited 2023 Apr 17];16(19):3781. Available from: http://dx.doi.org/10.3390/ijerph16193781 [PubMed] [Google Scholar]
5. Newman DK. Stress urinary incontinence in females: involuntary urine leakage during physical exertion affects countless females. Am J Nurs. 2003;103(8):46-55. [Google Scholar]
6. Luz R, Pereira I, Henriques A, Ribeirinho AL, Valentim-Lourenço A. King's Health Questionnaire to assess subjective outcomes after surgical treatment for urinary incontinence: can it be useful? Int Urogynecol J. 2017;28(1):139-45. [PubMed] [Google Scholar]
7. Ansar H, Adil F, Munir AA. Unreported urinary and anal incontinence in women. J Liaquat Univ Med Health Sci. 2005;4(2):54. [Google Scholar]
8. Seshan V, Muliira JK. Self-reported urinary incontinence and factors associated with symptom severity in community dwelling adult women: implications for women's health promotion. BMC Womens Health. 2013;13:16. [PubMed] [Google Scholar]
9. Prabhu SA, Shanbhag SS. Incidence and epidemiology of urinary incontinence in women. J Res Health Sci. 2013;17:125-30.
10. Kılıç M. Incidence and risk factors of urinary incontinence in women visiting family health centers. Springerplus. 2016;5(1):1331. [PubMed] [Google Scholar]
11. Sensoy N, Dogan N, Ozek B, Karaaslan L. Urinary incontinence in women: prevalence rates, risk factors and impact on quality of life. Pak J Med Sci. 2013;29(3):818. [PubMed] [Google Scholar]
12. Singh U, Agarwal P, Verma ML, Dalela D, Singh N, Shankhwar P. Prevalence and risk factors of urinary incontinence in Indian women: a hospital-based survey. Indian J Urol. 2013;29(1):31-6. [PubMed] [Google Scholar]
13. Ge J, Yang P, Zhang Y, Li X, Wang Q, Lu Y. Prevalence and risk factors of urinary incontinence in Chinese women: a population-based study. Asia Pac J Public Health. 2015;27(2):1118-31. [PubMed] [Google Scholar]
14. Sumardi R, Mochtar CA, Junizaf, Santoso BI, Setiati S, Nuhonni SA, Trihono PP, Rahardjo HE, Syahputra FA. Prevalence of urinary incontinence, risk factors and its impact: multivariate analysis from Indonesian nationwide survey. Acta Med Indones. 2014;46(3):175-82. [PubMed] [Google Scholar]
15. Abiola OO, Idowu A, Ogunlaja OA, Williams-Abiola

OT, Ayeni SC. Prevalence, quality of life assessment of urinary incontinence using a validated tool (ICIQ-UI SF) and bothersomeness of symptoms among rural community: dwelling women in Southwest, Nigeria. Int J Community Med Public Health. 2016;3(5):989-97. [Google Scholar]

16. Bodhare TN, Valsangkar S, Bele SD. An epidemiological study of urinary incontinence and its impact on quality of life among women aged 35 years and above in a rural area. Indian J Urol. 2010;26(3):353. [PubMed] [Google Scholar]
17. Saadia Z. Relationship between mode of delivery and development of urinary incontinence: a possible link is demonstrated. Int J Health Sci (Qassim). 2015;9(4):446-52. [PubMed] [Google Scholar]
18. Danforth KN, Townsend MK, Lifford K, Curhan GC, Resnick NM, Grodstein F. Risk factors for urinary incontinence among middle-aged women. Am J Obstet Gynecol. 2006;194(2):339-45. [PubMed] [Google Scholar]
19. Brown JS, Nyberg LM, Kusek JW, Burgio KL, Diokno AC, Foldspang A, Fultz NH, Herzog AR, Hunskaar S, Milsom I, Nygaard I, Subak LL, Thom DH; National Institute of Diabetes and Digestive Kidney Diseases International Research Working Group on Bladder Dysfunction. Proceedings of the National Institute of Diabetes and Digestive and Kidney Diseases International Symposium on epidemiologic issues in urinary incontinence in women. Am J Obstet Gynecol. 2003;188(6):77-88. [PubMed] [Google Scholar]
20. Rett MT, Simões JA, Hermann V, Gurgel MS, Morais SS. Women's life quality after physical therapy treatment for stress urinary incontinence. Rev Bras Ginecol Obstet. 2007;29(3):5-9. [Google Scholar]
21. Subak LL, Richter HE, Hunskaar S. Obesity and urinary incontinence: epidemiology and clinical research update. J Urol. 2009;182(6 Suppl):S2-7. [PubMed] [Google Scholar]

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