Female Urinary Incontinence: Prevalence, Risk Factors and Impact on the Quality of Life of Gynecological Clinic Attendees in Lagos, Nigeria

Fatimat Motunrayo Akinlusi, Tawaqualit Abimbola Ottun, Yusuf Abisowo Oshodi, Bilkees Oluwatoyin Seriki, Folasade D. Haleemah Olalere, Taiwo Olufunmilayo Kuye

Department of Obstetrics and Gynecology, Lagos State University College of Medicine/ Lagos State University Teaching Hospital, Ikeja, Nigeria.

Received: November 28, 2019 Accepted: May 5, 2020

ABSTRACT

Aims: To determine the prevalence of urinary incontinence, risk factors and impact on the quality of life in gynecological clinic attendees of a University Hospital.

Methods: A cross sectional descriptive study was conducted amongst gynecological clinic attendees in a Teaching Hospital in Nigeria from 1st February to 31st July 2017. Structured questionnaires were used to ascertain the presence of urinary incontinence. Socio-demographic and medical factors; impact on daily activities and treatment history were assessed. Women with and without urinary incontinence were compared. Univariate, bivariate and multivariable analyses were performed.

Results: There were 395 women of 25 - 67 years (mean age = 38.81±10.1). About 33% had experienced urinary incontinence in the previous 6 months with Urgency, Mixed and Stress urinary incontinence occurring in 18.0%, 7.6% and 7.3% respectively. Independent risk factors for urinary incontinence were age (odds ratio=0.49, 95% confidence interval [CI] =0.26 - 0.92, P =0.026), higher body mass index (odds ratio=1.92, 95% CI =1.53 - 3.00, P =0.004) and history of constipation (odds ratio=2.11, 95% CI =1.30 - 3.43, P =0.003). About 47% of those with urinary incontinence admitted to negative feelings like anxiety and depression; 45% had moderate to severe impact on their quality of life in all domains but only 27.7% sought help.

Conclusions: Urinary incontinence is common and risk factors include older age, high body mass index and constipation. Despite its substantial impact on the quality of life, majority do not seek help. Addressing modifiable risks factors and improving treatment seeking behaviour will assist in reducing the prevalence of urinary incontinence.

Keywords: female urinary incontinence; quality of life; risk factors; stress incontinence; urgency incontinence.

Citation : Akinlusi FM, Ottun TA, Oshodi YA, Seriki BO, Olalere FDH, Kuye TO. Female Urinary Incontinence: Prevalence, Risk Factors and Impact on the Quality of Life of Gynecological Clinic Attendees in Lagos, Nigeria. Nep J Obstet Gynecol. 2020;15(30):31–38. DOI: 10.3126/njog.v15i1.29338

INTRODUCTION

Urinary incontinence (UI) remains a public health concern being increasingly reported across age-groups and socio-economic strata. It is estimated to affect 200 million people worldwide, majority of who are females.[1] A systematic review reported a wide prevalence range of 16.2% - 81.9%;[2] possibly a result of variations in study populations, definition of UI, utilization of different sampling techniques and survey tools.

Though not often reported, leakage of urine is experienced by many women, who are approximately three times more likely than men to have urinary incontinence.[3] Stress UI however dominates in younger women while urge and mixed incontinence increase with age.

Age, obstetric factors, hysterectomy and obesity are the most common risk factors identified by epidemiological studies.[4–6] Smoking, menstrual cycle, menopause, fluid intake, constipation, and racial differences are however less often reported.[7]

Urinary incontinence impacts considerably on the quality of life, causing disability, embarrassment, social isolation, avoidance of sexual activity and dependence even among healthy looking women.

CORRESPONDENCE

Fatimat Motunrayo Akinlusi
Consultant Obstetrician/ Gynecologist
Lagos State University College of Medicine, Ikeja, Nigeria
Email: fatimatakinlusi@yahoo.co.uk; Phone: +234-8034069207

It may be associated with physical/psychological distress within the incontinent female population.[8] Apart from individual sufferings; UI causes substantial economic impact on the health systems accounting for a notable proportion of the total health-care budget in certain climes.[9]

Despite its impacts on the quality of life, UI has not received adequate attention in Nigeria. This study sets out to determine the prevalence of urinary incontinence; associated risk factors; impact on the quality of life and health seeking behavior of gynecological clinic attendees in a Teaching Hospital in Nigeria.

METHODS

A cross-sectional descriptive study conducted at the gynecological clinic of a University Teaching Hospital between 1st February and 31st July, 2017.

All consecutive attendees at the gynecological clinic during the study period were invited to participate irrespective of their age, parity or reason for consultation. Only non-consenting and mentally unfit women were excluded.

Pretested structured questionnaires were administered by trained research assistants to determine the presence of UI which was defined as complaint of any involuntary leakage of urine[10] in the previous six months. The severity of incontinence was also evaluated by the frequency and duration of urine leakage, as described by the women. Additional data obtained were socio-demographic characteristics; obstetrics, gynecological, medical and surgical risk factors; treatment history as well as impact on daily activities and quality of life (QOL). Women with and without urinary incontinence were compared.

A total of eleven questions were used to assess the impact of urinary incontinence on the quality of life of participants. The impact level on daily activities was measured on a Likert scale categorized into 'never affected', 'little affected', 'somewhat', 'much' and 'a great deal' which corresponded to scores of 0, 1, 2, 3 and 4 respectively. Possible scores ranged from 0 to 44 with higher scores reflecting increased impact on the QOL. Scores of 0-14; 15-29; and 30 or more; were categorized as mild, moderate and severe impact.

SPSS version 22.0 (statistical package for social sciences Inc. Chicago, III) was used for data analyses. Descriptive analysis as well as Pearson's Chi-squared test was used with p-value of 0.05. Multivariable logistic regression was used to identify factors that increased the odds of urinary incontinence.

Informed consent was obtained and approval for the study was from the hospital ethical review committee.

RESULTS

A total of 395 women between age 25-67 years (mean age =38.81±10.1) were enrolled; 61.3% had tertiary education and 50% were either overweight or obese. Single women were more (54.7%) than married (38.5%) and almost half of the women were primiparous. Nine in ten respondents had only vaginal deliveries (spontaneous or instrumental). Though greater than 90% of respondents received antenatal and postnatal care; just about 10% reported learning perineal exercises during pregnancy while 4% practiced these exercises after pregnancy. Only 10.6% of women had one or more caesarean sections till the time of this study. Forty percent had a history of constipation, 19.7% had a previous history of urinary tract infection while 29.4% had a history of dilatation and curettage.

Of the 395 participants enrolled in the study, 130 had experienced UI in the previous 6 months giving a prevalence rate of 32.9%. Urgency, Mixed and Stress UI occurred in 71 (18.0%), 30 (7.6%) and 29 (7.3%) respectively.

Age and body mass index (BMI) were potentially associated with urinary incontinence in our bivariate analysis. Women without urinary incontinence were younger than women with incontinence and the age difference was statistically significant [Table-1].

Table-1: Urinary Incontinence and Socio-demographic Characteristics

Variable	Urinary incontinence		Total	X^2	p-value
	Yes (n=130)	No (n=265)			
Age-group (years				8.933	0.030*
≤30	29(40.8)	42(59.2)	71(100.0)		
31-40	49(25.7)	142(74.3)	191(100.0)		
41-50	37(38.5)	59(61.5)	96(100.0)		
>50	15(40.5)	22(59.5)	37(100.0)		
Mean Age ± SD	43.37± 10.9	38.53± 9.7			0.025*
Marital status				1.624	0.654
Single	67(31.0)	149(69.0)	216(100.0)		
Married	53(34.9)	99(65.1)	152(100.0)		
Divorced	7(43.8)	9(56.2)	16(100.0)		
Widowed	3(27.3)	8(72.7)	11(100.0)		
Educational level				4.519	0.211
None	10(47.6)	11(52.4)	21(100.0)		
Primary	15(37.5)	25(62.5)	40(100.0)		
Secondary	34(37.0)	58(63.0)	92(100.0)		
Tertiary	71(29.3)	171(70.7)	242(100.0)		
Occupation				1.421	0.840
Civil servant	35(29.4)	84(70.4)	119(100.0)		
Skilled worker	34(34.3)	65(65.7)	99(100.0)		
Semi-skilled	5(29.4)	12(70.6)	17(100.0)		
Petty trader	45(36.0)	80(64.0)	125(100.0)		
unemployed	11(31.4)	24(68.6)	35(100.0)		
BMI class				18.936	0.001*
Underweight	7(87.5)	1(12.5)	8(100.0)		
Normal	70(37.8)	115(62.2)	185(100.0)		
Overweight	26(22.2)	91(77.8)	117(100.0)		
Obese	27(31.8)	58(68.3)	85(100.0)		

Majorities (87.6%) were premenopausal. Parity, learning perineal exercises during antenatal period and postpartum practice of pelvic exercises were significantly associated with urinary incontinence in our bivariate analysis. Interestingly menopausal status was not associated with urinary incontinence. Not a single one of the 31 nulliparous women, had experienced UI whereas more than 50% of the multiparous women had experienced UI in the previous 6 months [Table-2].

Table-2: Urinary Incontinence and Reproductive History

Variable	Urinary incontinence		Total	X^2	p-value
	Yes (n=130)	No (n=265)			
Age at menarche				0.950	0.622
<13	21(32.8)	43(67.2)	64(100.0)		
13-17	96(32.1)	203(67.9)	299(100.0)		
>17	13(40.6)	19(59.4)	32(100.0		
Age at marriage (n=178)				3.370	0.185
<18	5(45.5)	6(54.5)	11(100.0)		
18-35	44(31.4)	96(68.6)	140(100.0)		
>35	13(48.1)	14(51.9)	27(100.0)		
Menopausal status				3.460	0.056
Yes	22(44.9)	27(55.1)	49(100.0)		
No	108(31.2)	238(68.8)	346(100.0)		
Parity				63.538	0.001*
0	0(0.0)	31(100.0)	31(100.0)		
1	39(20.6)	150(100.0)	189(100.0)		
2	29(41.4)	41(100.0)	70(100.0)		
3	42(61.8)	26(100.0)	68(100.0)		
≥4	20(54.1)	17(100.0)	37(100.0)		

Variable	Urinary incontinence		Total	X^2	p-value
	Yes (n=130)	No (n=265)			
Age at delivery				0.115	0.737
≤18	9(36.0)	16(64.0)	25(100.0)		
>18	121(32.7)	249(100.0)	370(100.0)		
Delivery type				0.167	0.683
Vaginal	115(32.6)	238(67.4)	353(100.0		
Caesarean section	15(35.7)	27(64.3)	42(100.0)		
Labour duration (hours)				2.763	0.096
<12	112(34.8)	210(65.2)	322(100.0)		
≥12	18(24.7)	55(75.3)	73(100.0)		
Birth weight (gram)				0.247	0.619
≤3500	112(32.5)	233(67.5)	345(100.0)		
>3500	18(36.0)	32(64.0)	50(100.0)		
Antenatal care				2.439	0.118
Yes	129(33.5)	256(66.5)	385(100.0)		
No	1(10.0)	9(90.0)	10(100.0)		
Learnt perineal exercise during ANC				8.068	0.005*
Yes	22(52.4)	20(47.6)	42(100.0)		
No	108(30.6)	245(69.4)	353(100.0)		
Practiced pelvic exercise during postnatal period				8.046	0.003*
Yes	10(66.7)	5(33.3)	15(100.0)		
No	120(31.6)	260(68.4)	380(100.0)		
Postnatal care				1.381	0.240
Yes	125(33.6)	246(66.4)	372(100.0)		
No	5(21.7)	18(78.3)	23(100.0)		
Immediate postnatal complication				0.806	0.369
Yes	5(45.5)	6(54.5)	11(100.0)		
No	125(32.6)	259(67.4)	384(100.0)		

Of the past medical indices assessed, previous constipation, history of urinary tract infection (UTI), previous pelvic inflammatory disease (PID) and past dilation and curettage (D&C) were similarly associated with urinary incontinence in the bivariate analysis. A half of the 78 women with positive history of UTI experienced UI while just about a quarter (28.7%) of the 317 women without UTI admitted to previous urinary incontinence [Table-3].

Table-3: Association between Urinary Incontinence and Past Medical History

Variable	Urinary incontinence		Total	X^2	p-value
	Yes (n=130)	No (n=265)			
Previous constipation				17.247	0.001*
Yes	71 (44.9)	87 (55.1)	158 (100.0)		
No	59 (24.9)	178 (75.1)	237 (100.0)		
Previous cough >8 weeks				1.932	0.164
Yes	11 (45.8)	13 (54.2)	24 (100.0)		
No	119 (32.1)	252 (67.9)	371 (100.0)		
Previous pelvic surgery				0.497	0.481
Yes	30 (36.1)	53 (63.9)	83 (100.0)		
No	100 (32.1)	212 (67.9)	312 (100.0)		
History of UTI in the past				12.854	0.001*
Yes	39 (50.0)	39 (50.0)	78 (100.0)		
No	91 (28.7)	226 (71.3)	317 (100.0)		
History of PID				8.570	0.003*
Yes	47 (44.3)	59 (55.7)	106 (100.0)		
No	83 (28.7)	206 (71.3)	289 (100.0)		
Past dilation &curettage				6.475	0.011*
Yes	49 (42.2)	67 (57.8)	116 (100.0)		
No	81 (29.0)	198 (71.0)	279 (100.0)		

On Logistic Regression analysis, independent risk factors for UI were age (odds ratio=0.49, 95% confidence interval [CI] =0.26 - 0.92, P =0.026), higher body mass index (odds ratio=1.92, 95% CI =1.53 - 3.00, P =0.004) and history of constipation (odds ratio=2.11, 95% CI =1.30 - 3.43, P =0.003). Women between 31 and 40 years were less likely than those aged 30 years and below to experience UI. Also, overweight and obese women were at least one and a half times more likely to experience UI than women with normal weight. Those with positive history of constipation had two times the risk of UI than those without constipation [Table-4].

Table-4: Logistic regression showing independent predictors for urinary incontinence

Variable	p-value	Odds ratio	95% CI
Age group (Years)			
≤30		1	
31-40	0.026*	0.485	0.256-0.919
41-50	0.374	0.721	0.350-1.483
>50	0.759	0.860	0.329-2.249
BMI class			
Normal		1	
Underweight	0.059	1.332	0.709-1.854
Overweight	0.019*	1.552	1.345-2.342
Obese	0.004*	1.918	1.532-3.004
Learnt perineal exercise during antenatal or postnatal period			
No		1	
Yes	0.076	1.939	0.932-4.035
Practised pelvic exercise in postnatal period			
No			
Yes		1	
	0.062	3.313	0.940-11.673
Number of pregnancy			
<2		1	
>2	0.860	1.063	0.542-2.081
Previous constipation			
No		1	
Yes	0.003*	2.111	1.299-3.430
Previous history of UTI			
No		1	
Yes	0.056	1.738	0.985-3.066
History of PID			
No		1	
Yes	0290	1.344	0.777-2.325
History of dilation and curettage			
No		1	
Yes	0.179	1.420	0.851-2.371

Among patients with urinary incontinence 45% have moderate to severe affectation of their quality of life in all domains. About 47% of those with UI admitted to notable negative feelings like anxiety and depression [Table-5].

Table-5: Quality of life of respondents with Urinary incontinence

Extent to which the condition affects respondents (n=130)	Never	Little	Somewhat	Much	A great deal
Prevented performance of domestic activity	63(48.5)	11(8.5)	52(40.0)	4(3.1)	0(0.0)
Prevented occupational engagement	72(55.4)	7(5.4)	49(37.7)	2(1.5)	0(0.0)
Prevented long distance travels	63(48.5)	7(5.4)	55(42.3)	5(3.8)	0(0.0)
Prevented interaction with other people	77(59.2)	1(0.8)	51(39.2)	0(0.0)	1(0.8)
Prevented attendance at religious ceremonies and other functions	68(52.3)	6(4.6)	52(40.0)	2(1.5)	2(1.5)
Prevented leisure activities	62(47.7)	5(3.8)	58(44.6)	3(2.3)	2(1.5)
Caused reduction in sexual activity	50(38.5)	9(6.9)	60(46.2)	4(3.1)	7(5.4)
Reduction in sexual satisfaction	55(42.3)	10(7.7)	54(41.5)	6(4.6)	5(3.8)
Invoked fear of rejection by partner	65(50.0)	5(3.8)	55(42.3)	4(3.1)	1(0.8)
Caused additional financial burden through medical care or laundry	58(44.6)	4(3.1)	57(43.9)	4(3.1)	7(5.4)
Invoked negative feeling such as blue mood, despair, anxiety and depression	51(39.2)	5(3.9)	61(46.9)	10(7.7)	3(2.3)

Only about a quarter of respondents sought help for UI. Of these, 91.7% sought orthodox medical interventions at health care facilities, while the rest reported use of alternative therapy. Majority however claimed there was no improvement in their condition even after intervention [Table-6].

Table-6: Treatment seeking behavior of respondents with urinary incontinence

Variable	Frequency (n=130)	Percentage (%)
Previous history of seeking treatment		
Yes	36	27.7
No	94	72.3
Place of treatment (n=36)		
Hospital	33	91.7
Traditional healer	3	8.3
Type of treatment (n=36)		
Pelvic floor exercise	9	25.0
Medication	24	66.7
Surgery	3	8.3
Effectiveness of treatment		
Effective	13	36.1
Not effective	19	52.8
Minimal improvement	4	11.1

DISCUSSION

The prevalence of urinary incontinence in this study was 32.9%, which is comparable with 30.6%, 29% and 38.1% previously reported. [11–13] but much higher than 2.8%, 5.2%, 12.2% and 15.2% documented by Ojengbede, Badejoko, Obioha and Rabiu respectively.[14–17] The ICS definition of UI was adopted in our study as in the EPINCONT study [12] and both reported comparable prevalence. Though majority of our participants were less than 50 years, similar to a Nigerian survey,[14] our prevalence is much higher, possibly a result of the hospital based nature and the fact that current UI was not reported separately from previous UI in our study.

Variations in prevalence may be due to differences in definitions, study type, target, population, inaccuracies of self-reporting and interval between studies amongst others.

Age group 31-40 years recorded the highest number of UI, similar to findings in Ilorin and Uyo.[11,13] Incidence of UI was also found to be highest in women 20 – 39 years of age in the Norwegian EPINCONT study.

Though stress urinary incontinence is predominant amongst younger women according to reports in most literature, [11,12,18] urgency incontinence was the most prevalent in our study. This is contrary to our expectations but similar to some other study findings.[15,19,20] This may be related to the reported history of urinary tract infection (UTI) in about 20% of our study population. UTI is a treatable cause of UI. It will be interesting to investigate this in more details in the near future.

Overweight,[5] BMI,[12] age,[16] and parity[11,12] have been previously established to be associated with urinary

incontinence. Ojengbede et al [14] found age, number of children, location, delivery mode and history of diabetes to be significantly associated with urge incontinence; however, only location remained significant in the logistic model.

We also found significant association of UI with age, body mass index (BMI), practice of postnatal pelvic exercise, parity, constipation, UTI, PID, dilatation and curettage. However, the independent risk factors were age, BMI and constipation.

Combined analyses of the incontinence types in our study might have contributed to the differences in independent risk factors documented. Our findings are similar to those of Ijaiya,[11] who found significant association of these factors with urinary incontinence.

Epidemiological studies cite overweight and obesity as important risk factors for urinary incontinence.[5] Weight loss by both surgical and more conservative approaches is effective in reducing urinary incontinence symptoms and should be strongly considered as a first line treatment for overweight and obese women with urinary incontinence.[5] With advancing age and obesity there is progressive loss of muscle tone, decreased contractility and changes in hormonal stimulation.

Pregnancy and labor are known to predispose to a combination of injury to the pelvic floor musculature, connective tissue and nerves. Marinkovic and his colleagues[21] emphasized that trauma to the pelvic floor muscles and structures from childbirth could result in stress urinary incontinence. It is instructive to note that our study revealed no independent association with parity.

In all the domains assessed such as social interaction, sexual activity, finances and emotional status, quality of life was impacted significantly. About 47% of those with UI admitted to having negative feelings such as despair, anxiety and depression while 45% had a cumulative moderate to severe impact on their quality of life in all domains.

Respondents' health seeking behavior was poor with merely 27.7% of those affected seeking care. This is comparable with findings in Spain, Germany, France, and Pennsylvania where 24%, 25%, 33% and 25.5% sought help[22,23] but higher than 12.9% reported in Ibadan.[24]

Women may not seek help if they perceive UI as a usual, unavoidable part of aging not warranting hospital consultation. Others may not, possibly due to embarrassment or lack of knowledge about availability of treatment[25] The severity of UI may also affect the health care seeking behavior. Mild UI might contribute to deferral of treatment. Meral Kılıç, in his study, reported mild urinary incontinence in 77.5 % of incontinent participants and only 29.3% of them sought help.[8] He concluded that the low rate may be because majority of the women had mild urinary incontinence.

CONCLUSIONS

Urinary incontinence is a common problem amongst reproductive age women and most do not seek help. Independent risk factors include age, body mass index, and history of constipation. It impacts significantly on women's quality of life. Women should be encouraged to avoid modifiable risk factors and disclose urinary leakage promptly. This will enhance early intervention and better quality of life.

REFERENCES

1. Taylor W, Weir M, Cahill J, Rizk D. The Self-reported Prevalence and Knowledge of Urinary Incontinence and Barriers to Health Care-Seeking in a Community Sample of Canadian Women. Am J Med Sci. 2013;3(5):97-102.
2. Kwon BE, Kim GY, Son YJ, Roh YS, You MA. Quality of life of women with urinary incontinence: A systematic literature review. Int Neurourol J. 2010;14(3):133-8. doi:10.5213/inj.2010.14.3.133.
3. Milsom I, Gyhagen M. The prevalence of urinary incontinence. Climacteric. 2019;22(3):217-22. doi:10.1080/13697137.2018.1543263.
4. Sangsawang B, Sangsawang N. Stress urinary incontinence in pregnant women: A review of prevalence, pathophysiology, and treatment. Int Urogynecol J. 2013;24(6):901-12. doi:10.1007/s00192-013-2061-7.
5. Whitcomb EL, Subak LL. Effect of weight loss on urinary incontinence in women. Open Access J Urol. 2011;3(1):123-32. doi:10.2147/OAJU.S21091.
6. Faiena I, Patel N, Parihar JS, Calabrese M, Tunuguntla H, Robert R. Conservative Management of Urinary Incontinence in Women. Rev Urol. 2015;17(3):129-39. doi:10.3909/riu0651.
7. Cameron AP, Heidelbaugh JJ, Jimbo M. Diagnosis and office-based treatment of urinary incontinence in adults. Part

one: Diagnosis and testing. Ther Adv Urol. 2013;5(4):181-7. doi:10.1177/1756287213489720.

8. Kılıç M. Incidence and risk factors of urinary incontinence in women visiting Family Health Centers. Springerplus. 2016;5(1). doi:10.1186/s40064-016-2965-z.

9. Wagner T, Moore K, Subak L, De Wachter S, Dudding T. Incontinence : 6th ICI. 6th ed. (Abrams P, Cardozo L, Wagg A, Wein A, eds.). Tokyo; 2016. https://www.ics.org/education/icspublications/icibooks/6thicibook%0Ahttps://www.ics.org/education/icspublications/icibooks.

10. Haylen BT, Ridder D de, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) Joint Report on the Terminology for Female Pelvic Floor Dysfunction. Neurourol Urodyn. 2010;29:4-20. doi:10.1002/nau.

11. Ijaiya MA, Raji HO, Aboyeji AP, Adesina KT, Adebara IO, Ezeoke GG. Non-fistulous urinary leakage among women attending a Nigerian family planning clinic. Int J Womens Health. 2011;3:409-413. doi:10.2147/IJWH.S23179.

12. Ebbesen MH, Hunskaar S, Rortveit G, Hannestad YS. Prevalence, incidence and remission of urinary incontinence in women: Longitudinal data from the Norwegian HUNT study (EPINCONT). BMC Urol. 2013;13. doi:10.1186/1471-2490-13-27.

13. Udokang N, Inyang O, Dick S. Urinary Incontinency in Women in Uyo Metropolis, South-South, Nigeria. Eur J Sustain Dev. 2016;5(1):145-52. doi:10.14207/ejsd.2016.v5n1p145.

14. Ojengbede OA, Morhason-Bello IO, Adedokun BO, Okonkwo NS, Kolade CO. Prevalence and the associated trigger factors of urinary incontinence among 5000 black women in sub-Saharan Africa: Findings from a community survey. BJU Int. 2011;107(11):1793-1800. doi:10.1111/j.1464-410X.2010.09758.x.

15. Badejoko OO, Bola-Oyebamiji S, Awowole IO, Salako AA, Ogunniyi SO. Urinary incontinence: prevalence, pattern, and opportunistic screening in Ile-Ife, Nigeria. Int Urogynecol J. 2016;27(2):269-73. doi:10.1007/s00192-015-2826-2.

16. Obioha KC, Ugwu EO, Obi SN, Dim CC, Oguanuo TC. Prevalence and predictors of urinary/anal incontinence after vaginal delivery: prospective study of Nigerian women. Int Urogynecol J. 2015;26(9):1347-54. doi:10.1007/s00192-015-2690-0.

17. Press D. Risk factors for maternal mortality associated with eclampsia presenting at a Nigerian tertiary hospital. Int J Womens Health. 2018;10:715-21. doi:10.2147/IJWH.S178729.

18. Milsom I, Altman D, Cartwright R, Lapitan MC, Nelson R, Sillén U, et al. Epidemiology of Urinary Incontinence (UI) and other Lower Urinary Tract Symptoms (LUTS), Pelvic Organ Prolapse (POP) and Anal Incontinence (AI). In Abrams P, Cardozo L, Khoury S, Wein AJ, editors, Incontinence: 5th International Consultation on Incontinence, Paris, February 2012. 5th ed ed. Paris: ICUD-EAU. 2013. p. 15-107.

19. 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):1953-8. doi:10.18203/2349-2902.isj20172131.

20. 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). doi:10.12669/pjms.293.3404.

21. Marinkovic SP, Rovner ES, Moldwin RM, Stanton SL, Gillen LM, Marinkovic CM. The management of overactive bladder syndrome. BMJ. 2012;344(7853). doi:10.1136/bmj.e2365.

22. Junqueira JB, Santos VLC de G. Urinary incontinence in hospital patients: prevalence and associated factors. Rev Lat Am Enfermagem. 2018;25:e2970. doi:10.1590/1518-8345.2139.2970.

23. Pedersen SL, Lose G, Høybye MT, Elsner S, Waldmann A, Rudnicki M. Prevalence of urinary incontinence among women and analysis of potential risk factors in Germany and Denmark. Acta Obstet Gynecol Scand. 2017;96(8):939-48. doi:10.1111/aogs.13149.

24. Adedokun BO, Morhason-Bello IO, Ojengbede OA, Okonkwo NS, Kolade C. Help-seeking behavior among women currently leaking urine in Nigeria: Is it any different from the rest of the world? Patient Prefer Adherence. 2012;6:815-9. doi:10.2147/PPA.S24911.

25. Wood LN, Anger JT. Urinary incontinence in women. BMJ. 2014;349. doi:10.1136/bmj.g4531.