International Journal of Research in Medical Sciences
Sulaiman B et al. Int J Res Med Sci. 2026 Jan;14(1):10-16
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20254355

Original Research Article

Prevalence, risk factors and quality of life impact of urinary incontinence in pregnancy at a northcentral Nigerian tertiary hospital

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Received: 11 March 2025
Accepted: 11 December 2025

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ABSTRACT

Background: Urinary incontinence during pregnancy is a distressing but often under-recognized condition with physical, psychological, and social consequences. Despite its impact, UI remains underreported and underexplored in Nigeria. This study aimed to determine the prevalence, risk factors, and quality-of-life impact of urinary incontinence among pregnant women attending antenatal care at a tertiary hospital in Northcentral Nigeria.
Methods: This was a cross-sectional study conducted among 959 pregnant women attending antenatal care at University of Abuja Teaching Hospital, Abuja. Eligible participants completed a structured questionnaire, including the International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ-UI-SF). Data were analysed using SPSS v25. Associations were tested with chi-square and logistic regression, with significance set at $p<0.05$.
Results: The mean age was 31.1±5 years, and the prevalence of UI was 14.1%. Stress urinary incontinence was most common (54.6%), followed by mixed (20.0%) and urge (18.5%). Most cases were mild (58.5%), though 15.4% were severe. Independent predictors included single marital status (aOR=2.76), occupation (civil servant aOR=2.21; business aOR=1.98), instrumental delivery (aOR=2.85), neonatal birthweight ≥3.6 kg (aOR=8.90), perineal injury (aOR=6.12), and chronic cough (aOR=4.21).
Conclusions: UI affects a notable proportion of pregnant women, predominantly as stress incontinence of mild severity. Key risk factors span sociodemographic, obstetric, and clinical domains. Incorporating routine screening, pelvic floor education, and preventive strategies into antenatal care could mitigate the burden and improve maternal quality of life.

Keywords: Quality of life, Nigeria, Pregnancy, Prevalence, Risk factors, Urinary incontinence

INTRODUCTION

Urinary incontinence, defined as the complaint of any involuntary leakage of urine, is a common and distressing condition that can negatively affect women's physical, psychological, and social well-being.[1] During pregnancy, urinary incontinence is particularly relevant due to the physiological and anatomical changes of gestation, yet it often receives limited clinical attention compared to other obstetric concerns.[2,3] Many women do not report symptoms because of embarrassment or misconceptions

that it is a normal feature of pregnancy, while healthcare providers may not routinely screen for it.[4] Consequently, the condition is underdiagnosed and undertreated in antenatal care.

Globally, urinary incontinence in pregnancy is recognised as a significant public health concern due to its prevalence and quality-of-life impact.[5-7] Reported mean prevalence was 41.0% (range of 9-75%) reflecting differences in population characteristics, diagnostic criteria, and health-seeking behaviours.[7] Studies from sub-Saharan Africa suggest lower prevalence, including 21.1% among pregnant women in northern Nigeria, but underreporting and limited research likely contribute to these findings.[8-10] Risk factors include multiparity, previous vaginal deliveries, obesity, and conditions that increase intra-abdominal pressure, while hormonal and mechanical changes in pregnancy further predispose women to leakage.[7,11]

Beyond physical symptoms, urinary incontinence can cause embarrassment, social withdrawal, reduced daily functioning, sexual dysfunction, and poor self-esteem, with severe cases affecting occupational performance and mental health. Despite these consequences, the condition remains underrepresented in regional literature, limiting awareness among clinicians and policymakers and hindering the integration of screening and early intervention into antenatal programs.

This study therefore aimed to determine the prevalence of urinary incontinence in pregnancy, identify associated risk factors, and assess its impact on quality of life among women attending antenatal care at a tertiary hospital in northcentral Nigeria. Findings are expected to provide much-needed local data and support strategies for improved maternal health care.

METHODS

Study design and setting

This was a hospital-based cross-sectional study conducted at the antenatal clinic of the University of Abuja Teaching Hospital (UATH), a tertiary referral facility in the Federal Capital Territory (FCT), Northcentral Nigeria. The hospital serves the FCT and neighbouring states, providing specialised obstetric and gynaecological services.

Study population and sample size

The study population comprised pregnant women attending routine antenatal care at UATH. The sample size was calculated using the Kish and Leslie formula:[12]

$$N=Z^2\times P(1-P)/D^2$$

Where; Z=1.96 (95% confidence level), P=0.281 (28.1% prevalence of UI in pregnancy in Ikere-Ekiti, Nigerian)[9], D=0.03 (desired precision).

A minimum sample size of 863 was obtained and after adjusting for a 10% non-response rate, the sample size was set at 959 participants.

Sampling and recruitment

Participants were recruited through random selection during routine antenatal clinic visits. Research assistants screened eligible women against the inclusion and exclusion criteria, provided study information and obtained written informed consent before enrolment.

Inclusion criteria

Pregnant women at ≥13 weeks gestation, and age ≥18 years were included.

Exclusion criteria

Women in labour at the time of recruitment, history of previous pelvic or incontinence surgery, diagnosed urinary tract infection at recruitment, history of diabetes mellitus or neurological disorders (e.g., paraplegia), mental health conditions impairing informed consent or questionnaire completion were excluded.

Data collection tools and procedures

Data were collected using a structured, self-administered questionnaire consisting of:

Sociodemographic and obstetric history (e.g. age, parity, gestational age, occupation, educational level, prior delivery history).

The International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI-SF, UK English version).

The ICIQ-UI-SF includes three scored items assessing frequency, severity, and quality-of-life impact of UI, plus eight self-diagnostic items identifying UI subtype. Scores range from 0-21, with higher scores indicating greater severity. The tool has demonstrated strong validity, reliability, and responsiveness across diverse populations.[13]

Outcome measures

The primary outcome was the prevalence of urinary incontinence among pregnant women. Secondary outcomes included distribution of UI subtypes, risk factors associated with UI and impact of UI on quality of life.

Data management and statistical analysis

Data were analysed using SPSS version 25 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequencies and percentages for categorical variables, as means ± standard deviations for continuous variables and

mode for scores. Associations between UI and potential risk factors were assessed using Pearson's chi-square test or Fisher's exact test, as appropriate. Logistic regression was performed to identify independent predictors of urinary incontinence, with results expressed as adjusted odds ratios (aOR) and 95% confidence intervals. A p-value <0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of UATH. Participation was voluntary, refusal did not affect care, and withdrawal was permitted at any stage without consequence. Data were anonymised and handled with strict confidentiality.

RESULTS

Of the 959 women recruited, 922 (96.1%) returned completed questionnaires. The mean age of respondents was 31.1±5 years, with the majority (66.5%) aged 25-34 years. The modal parity was one, and most participants (73.4%) had parity of 1-4. The mean gestational age was 30±6 weeks. One hundred and thirty (14.1%) women reported involuntary loss of urine.

In Table 1, the prevalence of urinary incontinence did not differ significantly across age groups (χ^2=2.94, p=0.56). However, marital status showed a statistically significant association, with single women more likely to report incontinence than married women (5.4% vs. 1.9%; χ^2=6.99, p=0.008). The odds ratio (OR=2.94, 95% CI: 1.22-7.09) indicated that single women were nearly three times more likely to experience incontinence compared to their married counterparts. Educational status demonstrated a significant relationship (χ^2=13.05, p=0.0045), with higher prevalence observed among women with no formal education (50%) compared to those with secondary or tertiary education. Occupation was also significantly related to urinary incontinence (χ^2=30.30, p<0.00001). Students (26.6%) and civil servants (18.1%) had higher proportions of incontinence compared to, housewives, business women and farmers. The odds ratio (OR=2.45, 95% CI: 1.38-4.35) suggests that women in school of formal occupations were more than twice as likely to report urinary incontinence (Table 1).

Table 1: Relationship between urinary incontinence and sociodemographic factors.

Variable	Continent (%)	Incontinent (%)	χ2	OR (CI)	AR
Age (years)					
15-24	73 (84.9)	13 (15.1)	χ^2=2.94 p=0.56	2.10 (0.62-2.43)	12.5
25-34	536 (87.4)	77 (12.6)			
35-44	183 (82.1)	40 (17.9)			
Marital status					
Married	777 (86.3)	123 (13.7)	χ^2=6.99 p=0.008	2.94 (1.22-7.09)	3.5
Single	15 (68.2)	7 (31.8)			
Religion					
Christianity	564 (85.2)	98 (14.8)	F=1.44 p=0.49	0.83 (0.53-1.30)	-3.7
Islam	224 (87.5)	32 (12.5)			
Others	4 (100)	0			
Education					
None	3 (50)	3 (50)	F=13.05 p=0.0045	0.62 (0.36 -1.06)	-4.1
Primary	11 (100)	0 (0.0)			
Secondary	178 (95.7)	8 (4.3)			
Tertiary	600 (84.6)	109 (15.4)			
Occupation					
Student	69 (73.4)	25 (26.6)	F=30.30, p<0.00001	2.45 (1.38-4.35)	20
Housewife	217 (94.3)	13 (5.7)			
Civil servant	230 (81.9)	51 (18.1)			
Business	224 (84.6)	41 (15.4)			
Farming	52 (100)	0			

In Table 2, some clinical factors demonstrated statistically significant relationships with urinary incontinence. Individuals weighing ≥90kg had a significantly higher prevalence of incontinence (41.9.7%) compared to those <90kg (12.6%) (χ^2=5.31, p=0.02). The odds ratio (OR=1.65, CI: 1.06-2.57) indicates a moderately increased risk. Incontinence was significantly associated with trimester (χ^2=13.97, p=0.0009), suggesting gestational progression may influence symptom onset. Instrumental delivery showed the highest incontinence rate (34.4%) and the association was highly significant (χ^2=26.21, p<0.0001) with an OR of 3.45 (CI: 1.52-7.83). Delivering a baby ≥3.6kg was strongly associated with incontinence (χ^2=55.92, p<0.0001), with a striking OR of 10.42 (CI: 4.79-2.67), indicating a tenfold increase in risk. A very strong association was observed (χ^2=47.87, p<0.0001),

with 78.7% of incontinent individuals reporting perineal injury. OR=7.47 (CI: 3.78-4.76) highlights a substantial risk elevation. Presence of chronic cough was significantly linked to incontinence (χ^2=21.05, p<0.00001), with an OR of 5.39 (CI: 2.27-0.68), suggesting increased intra-abdominal pressure may be a contributing factor (Table 2). Multivariate logistic regression analysis identified several independent predictors of urinary incontinence. Significant associations were observed with marital status (aOR=2.76, 95% CI: 1.11-6.84, p=0.03), occupation (aOR=2.21 and 1.98, p=0.01 and 0.04), mode of delivery (aOR=2.85, 95% CI: 1.21-6.71, p=0.016), baby weight >3.6kg (aOR=8.90, 95% CI: 4.01-19.75, p<0.001), perineal injury (aOR=6.12, 95% CI: 2.94-12.75, p<0.001), and chronic cough (aOR=4.21, 95% CI: 1.75-10.13, p=0.001). These findings suggest that both obstetric and respiratory factors play a substantial role in the development of urinary incontinence. Variables such as education level and weight >90kg did not show statistically significant associations (Table 3).

Table 2: Relationship between clinical features and urinary incontinence.

Factor	Continent (%)	Incontinent (%)	χ2	OR	AR
Weight					
<90 kg	642 (87.2)	94 (12.6)	χ^2=5.31 p=0.02	1.65 (1.06-2.57)	8.8
≥90 kg	50 (58.1)	36 (41.9)			
Parity					
0	174 (82.5)	37 (17.5)	F=2.72 p=0.257	1.40 (0.89-2.19)	4.4
1-4	588 (86.9)	89 (13.1)			
≥ 5	30 (88.2)	4 (11.8)			
Trimester					
1st	1 (25)	3 (75)	F=13.97 p=0.0009	0.68 (0.13-3.57)	4.6
2nd	232 (84.1)	44 (15.9)			
3rd	559 (87.1)	83 (12.9)			
Miscarriage					
0	458 (85.8)	76 (14.2)	F=0.04 p=0.98	1.03 (0.69-1.53)	-0.4
1-3	317 (86.1)	51 (13.9)			
≥4	17 (85)	3 (15)			
Mode of last delivery					
SVD	483 (92.4)	40 (7.6)	χ^2=26.21 p<0.0001	3.45 (1.52-7.83)	13.5
Instrumental delivery	19 (65.5)	10 (34.4)			
Caesarean section	148 (93.1)	11 (6.9)			
Weight of the last baby					
<2.5	30 (83.3)	6 (16.9)	χ^2=55.92 p<0.0001	10.42 (4.79-2.67)	47.6
2.5-3.5	448 (97.2)	13 (2.8)			
≥3.6	72 (63.2)	42 (36.8)			
Perineal injury					
No	436 (97.1)	13 (2.9)	χ^2=47.87 p<0.0001	7.47 (3.78-4.76)	57.4
Yes	214 (81.7)	48 (18.3)			
Constipation					
No	771 (85.9)	127 (14.1)	F=0.052 p=0.82	1.23 (0.31-4.91)	0.6
Yes	21 (87.5)	3 (12.5)			
Chronic cough					
No	772 (86.9)	116 (13.1)	χ^2=21.05 p<0.00001	5.39 (2.27-0.68)	8.3
Yes	20 (58.8)	14 (41.2)			
Smoking					
No	776 (85.8)	128 (14.2)	F=0.43, p=0.51	0.71 (015-3.34)	-0.6
Yes	16 (88.9)	2 (11.1)			
Alcohol					
No	777 (86)	127 (14.0)	F=2.72, p=0.26	2.33 (0.61-8.88)	1.3
1-3 glasses	8 (72.7)	3 (27.3)			
More than 3 glasses	7 (100)	0			
History of incontinence					
No	774 (86.2)	124 (13.8)	χ^2=2.45, p=0.120	2.05 (0.77-5.45)	2.3
Yes	18 (75)	6 (25)			

Table 3: Multivariate logistic regression analysis for independent risk factors.

Variable	aOR (CI)	P value
Marital status	2.76 (1.11-6.84)	0.03
Education	0.74 (0.41-1.33)	0.31
Occupation (housewife vs civil servant)	2.21 (1.18-4.14)	0.01
Occupation (housewife vs student)	1.98 (1.03-3.80)	0.04
Weight ≥ 90kg	1.42(0.91-2.23)	0.12
Mode of delivery	2.85 (1.21-6.71)	0.016
Baby weight ≥ 3.6kg	8.9 (4.01-19.75)	<0.001
Perineal injury	6.12 (2.94-12.75)	<0.001
Chronic cough	4.21 (1.75-10.13)	0.001

Table 4: Type and severity of urinary incontinence among the pregnant women.

Type incontinence	Frequency (%)
Stress UI	71 (54.6)
Urge UI	24 (18.5)
Mixed UI	26 (20)
Other causes	9 (6.9)
Severity of incontinence	
ICIQ-UI-SF modal score	3
Slight (1-5)	76 (58.5)
Moderate (6-12)	34 (26.1)
Severe (13-18)	20 (15.4)
Very severe (19-21)	0

In table 4, among pregnant women reporting urinary incontinence, stress urinary incontinence (SUI) was the most prevalent type (54.6%). A smaller proportion (6.9%) reported incontinence due to other causes.

Assessment of severity using the ICIQ-UI-SF revealed a modal score of 3, indicating that most cases were mild. Specifically, 58.5% of respondents fell within the slight severity range (scores 1-5). Severe incontinence (scores 13-18) was reported by 15.4%, and no cases were classified as very severe (scores 19-21).

DISCUSSION

The prevalence of urinary incontinence was 14.1% from this study. This prevalence is lower than what has been described locally. Nigerian studies commonly reported higher burdens: about 21.1% in Zaria and 28.1% in Ikere-Ekiti, while a longitudinal Nigerian study observed rising incidence across the trimesters (22%, 30.5%, 48% respectively).[8-10] Across Africa, systematic reviews estimated a pooled prevalence of 21-24%, again above our estimate.[5,11] Other studies across the globe put the prevalence of urinary incontinence in pregnancy between 16.7-84.5%.[14-19] However, a systematic review of global data typically placed pregnancy-related urinary incontinence around 41%, with wide heterogeneity (9-75%).[5,20] Thus, our 14.1% figure is comparatively low. Potential explanations include minimal bother, under-reporting due to ignorance or stigma, sample size and sampling differences (hospital vs community), instrument administration, and population structure (e.g., modal parity of one; mean BMI/weight distribution), all of which are known to influence observed prevalence. Differences in diagnostic criteria, cultural reporting biases, and variations in obstetric risk factors may explain some of these discrepancies.

Being single was associated with nearly threefold higher odds of UI (aOR 2.76). Marital status is less frequently highlighted as a determinant in pregnancy-urinary incontinence studies, so this may reflect unmeasured confounding (e.g., age, social support, occupational profile and health-seeking behaviour).[19,21] Similar context-specific associations with marital status have not been described in Nigerian pregnant and non-pregnant samples, therefore evidence during pregnancy remains sparse and warrants replication and confirmation. Education showed a crude gradient (lower education, higher urinary incontinence) but was not significant after adjustment, suggesting confounding by other factors. This aligns with mixed findings globally, where education commonly tracks with health literacy and care access rather than exerting an independent biological effect.[19,22-24] Occupational status was a strong determinant, with students reporting nearly twice the risk of urinary incontinence compared with women in other occupations. This may be related to sedentary lifestyle patterns, stress, or reduced opportunities for pelvic floor exercise. While some authors demonstrated that no relationship exist between urinary incontinence and occupation, Wang et al and Okunola et al found a significant association between them.[9,10,19,22,26] Maternal weight ≥90 kg emerged as an independent risk factor, consistent with established evidence that obesity increases intra-abdominal pressure and compromises pelvic floor integrity.[11]

Our data confirmed several well-recognised obstetric drivers. Advancing gestation was associated with urinary incontinence on bivariate analysis, consistent with observations from other authors that show increasing prevalence with pregnancy progression.[17,21,27] Operative vaginal delivery and perineal injury showed strong associations (aOR 2.85 and 6.12, respectively), in line with studies linking pelvic floor trauma to postpartum continence problems.[7] Although episiotomy's role is debated, perineal tears and instrumented births are repeatedly implicated in later pelvic floor dysfunction.[26,28] Notably, delivering a baby ≥3.6 kg was one of the strongest predictors (aOR 8.90), in contrast Akinlusi et al and Hersh et al did not find any significant relationship between birth weight and urinary incontinence.[22,28] This could be due to confounding factors or biodemographic variability. The biomechanical loading during late pregnancy and birth likely contributes to antenatal leakage.[2,7] Chronic cough independently quadrupled the odds of urinary incontinence (aOR 4.21), aligning with

reports that chronic cough increases intra-abdominal pressure and predisposes to stress urinary incontinence[7,21] Emerging studies, including cohorts of nulliparous gravidas identify chronic cough and recurrent respiratory issues as modifiable risk factors for incontinence in pregnancy.[29] Body weight ≥90 kg showed only a modest crude association and lost significance in multivariable analysis, reflecting mixed findings where BMI/weight often confers risk but can be confounded by parity, age, and obstetric exposures.[7,8,24,26,30]

The predominant type of incontinence observed was stress urinary incontinence (54.6%), and it mirrors global patterns and consistent with the pathophysiology of increased intra-abdominal pressure during pregnancy and weakening of pelvic floor support structures.[7,11,20,31-33] Urge and mixed incontinence accounted for smaller but notable proportions, while severity was generally mild to moderate. Importantly, no cases of very severe incontinence were reported, which underscores the self-limiting nature of most pregnancy-associated urinary incontinence. This is consistent with global literature suggesting that while urinary incontinence is common, it is often experienced as mildly bothersome.[7] However, even mild symptoms can affect quality of life, as shown in African and non-African studies, which linked urinary incontinence to emotional distress, social withdrawal, and reduced self-esteem.[17-19,23,32]

The clinical implications of these findings are significant. Identifying modifiable risk factors such as obesity and chronic cough offers opportunities for targeted preventive interventions, including weight optimization, smoking cessation (to reduce cough), and pelvic floor muscle training during antenatal care. Early counselling may also reduce stigma and improve quality of life. Clinically, the signal around obstetric trauma (instrumental birth, perineal injury) and macrosomia supports preventive strategies already emphasised globally: antenatal screening for urinary incontinence, counselling and supervised pelvic floor muscle training, optimisation of gestational weight gain and glycaemic control to reduce fetal overgrowth, and intrapartum practices to minimize perineal injury and judicious use of instruments.[27,34] Proactive identification and treatment of chronic respiratory conditions before or during pregnancy may also reduce stress urinary incontinence.

The strengths of this study include its relatively large sample size and high response rate (96.1%), which enhances the validity of findings. However, limitations must be acknowledged. The cross-sectional design precludes causal inference, and reliance on self-reported symptoms may have led to underreporting due to embarrassment or cultural perceptions. Additionally, the high educational attainment of the cohort may limit generalisability to populations with lower literacy levels.

CONCLUSION

The prevalence of urinary incontinence among pregnant women in this study is lower than most national and international estimates. Stress urinary incontinence was the predominant type, generally mild in severity. Significant associations were observed with sociodemographic, obstetric, and clinical factors, while independent predictors included single marital status, employment in formal or business occupations, operative vaginal delivery, perineal trauma, macrosomic birth, and chronic cough. These findings highlight the contribution of both obstetric trauma and modifiable risk factors to pregnancy-related incontinence. Routine screening during antenatal care, preventive interventions such as pelvic floor muscle training, weight management, respiratory care, and safe intrapartum practices may reduce its occurrence.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Health Research Ethics Committee of University of Abuja Teaching Hospital (UATH/HREC/PR/2018/018)

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Cite this article as: Sulaiman B, Omonua KI, Obanimoh A, Audu LJ, Ahmed RM, Shuaibu Y, et al. Prevalence, risk factors and quality of life impact of urinary incontinence in pregnancy at a northcentral Nigerian tertiary hospital. Int J Res Med Sci 2026;14:10-6.