

## ORIGINAL ARTICLE

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# Prevalence of urinary incontinence during pregnancy and its repercussions

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## ABSTRACT

**Introduction:** Urinary incontinence (UI) represents a condition that produces hygienic and social disorders for the patient, being more prevalent in women, due to the anatomy of the female pelvic floor, pregnancy, and childbirth. It is worth mentioning that UI has an impact on the quality of life in the pregnancy-puerperal cycle, with an increase in its incidence during pregnancy and the puerperium, with repercussions in several domains of women's lives. **Objective(s):** To assess the prevalence of UI in pregnant women, identify risk factors for its onset, and assess the impacts caused on the quality of life of pregnant women with urinary symptoms. **Methods:** This is an analytical quantitative cross-sectional study, carried out from October to December 2022. Data collection was carried out with the voluntary participation of 98 pregnant women in the maternity ward of a public hospital in the city of Belo Horizonte, to survey the sociodemographic data and the application of a life quality questionnaire (QoL). **Results:** Of the 98 patients interviewed, 35.1% had a positive response to the presence of urinary incontinence, with an average BMI of around 30 kg/m<sup>2</sup>, of which 8 were smokers before pregnancy and 21 of them had already had one or more vaginal deliveries, relating p value <0.006. Still, when asked about the impact on quality of life, through the King's Health Questionnaire, the average of the answers approached the concept "a little" contained in the questionnaire, indicating there was an impact on quality of life due to urinary symptoms. **Conclusion:** This study concluded that factors such as high BMI, smoking, and vaginal delivery are considered important for triggering urinary incontinence during pregnancy and negatively impact the quality of life of pregnant women, resulting in a worsening of the general perception of health.

**Keywords:** Urinary Incontinence; Pregnancy; Quality of Life.

## INTRODUCTION

The lower urinary tract (LUT) is composed of the bladder, sphincter apparatus, and urethra. For micturition to occur physiologically, coordinated actions between the sympathetic, parasympathetic, and somatic nervous systems, associated with central control centers, must be executed. In other words, neurological integrity and pelvic anatomy are necessary for the harmonic contraction of muscle fibers. Thus, alterations in this system can culminate in a process defined as urinary incontinence (UI), a symptom associated with various pathologies that can affect the lower urinary tract, characterized by involuntary loss of urine.<sup>1</sup>

Currently, UI is a prevalent symptom in the general population, being a manifestation of variable etiology. Epidemiologically, it mainly affects women after the fourth decade of life, however, its incidence in patients during the gestational-puerperal period is highly relevant. Regarding its etiopathogenesis, UI results from an association of genetic, anatomical, and lifestyle factors. The diagnosis is based on clinical signs reported by patients, associated with complementary tests that should be performed to identify this condition, such as urine and imaging tests. Regarding treatment, therapy with lifestyle changes, medication, and, in specific cases, a surgical approach may be adopted.<sup>2</sup>

Factors such as aging, hypoestrogenism in menopause, obesity, pregnancy, and multiple vaginal deliveries may be associated with the etiopathogenesis and onset of UI. Given the aforementioned factors, the female sex stands out as a high-risk group. The higher prevalence of UI in women compared to men is largely due to the anatomy of the female pelvic floor, pregnancy, and childbirth. Due to these factors, loss of continence can affect on average 50% of women at some point in their lives.<sup>3,4,5</sup>

UI has a significant impact on the gestational-puerperal cycle, with a high incidence during pregnancy and the postpartum period. This is due to the necessary adaptations, such as increased intra-abdominal pressure, associated with the weakening of pelvic floor structures and hormonal changes. UI affects several aspects of a woman's life, including limitations in daily and physical activities, as well as possible complications such as pain and recurrent infections. In addition, this condition often causes psychological and social impact, generating discomfort and embarrassment. The lack of recent studies on the subject, especially after the pandemic, highlights the scarcity of updated data on this common and comorbid condition. Understanding both its prevalence and its

impacts is crucial for guiding clinical practices and health policies.<sup>6,7,8</sup>

Therefore, to promote a discussion on UI and its prevalence during the gestational period, the present study seeks to provide useful information and contribute to the improvement of women's health, by identifying associated risk factors and the impacts of this condition on the quality of life of pregnant women in a high-risk public maternity hospital in the city of Belo Horizonte.

## METHOD

The study was submitted and approved by the Research Ethics Committee (CAAE: 62871322.5.000.5134), respecting the principles of ethics and following Resolution 466/12 of the National Health Council. This is an analytical quantitative cross-sectional study that involves the participation of 98 patients chosen occasionally at a public hospital in the city of Belo Horizonte. The number for sampling was estimated considering a confidence level of 95% and a margin of error of  $\pm 10\%$ .

Pregnant women who attended a high-risk prenatal service were included. For data collection, a questionnaire developed by the researchers was used aiming at the survey of sociodemographic data for the characterization of the participating population using the variables: age, race, marital status, level of education, smoking, parities, physical activity, associated with a quality of life questionnaire (Qol) King's Health Questionnaire (KHQ), validated for the Brazilian population and scored for each of its domains, without overall scoring. Scores range from 0 to 100 and the higher the score obtained, the worse the related quality of life in that domain. The questionnaire was designed to meet the needs of the research in question. For this, a non-systematic literature review was carried out on previous studies published in the last five years

that addressed the same or similar theme, which helped in the choice of variables to be evaluated.

Between October and December 2022, data collection was carried out in the maternity ward waiting room. Pregnant women who voluntarily agreed to participate in the research first read and signed the Free and Informed Consent Form (FICF) which was printed in duplicate, one of which was delivered to the participant and the other remained with the researchers. They then answered the questionnaire.

Categorical variables were presented as absolute and relative frequencies and numerical variables as mean  $\pm$  standard deviation and/or median (1st quartile - 3rd quartile). Numerical variables were submitted to the Anderson-Darling Normality test and for possible comparisons of means/medians the t-test or Mann-Whitney test was used. To assess associations between categorical variables, the Chi-square test was used. The significance level is 5% and the data will be analyzed in R software version 4.0.3.

## RESULTS

The present study had the voluntary participation of 98 patients, with a mean age of 29 years (ranging from 24 to 34 years), as observed in Table 1 below. The gestational age had an average value of 31 weeks, with a predominance of women in the third trimester of pregnancy. Regarding the participants' education level, it was observed that 58% of the respondents had completed high school, and the minority had entered or completed higher education. It is also worth noting that about 51% of the respondents were single, while 43% were in a stable union. In the sample group in question, 40 women self-declared as belonging to the Black race.

**Table 1** - Characterization of the sample regarding sociodemographic variables.

Characteristic	n=98
<b>Age</b>	29 (24, 34)
<b>Gestational Age</b>	
<b>Education</b>	
Incomplete Elementary	8 (8.2%)
Complete Elementary	6 (6.1%)
Incomplete High School	17 (17%)
Complete High School	57 (58%)
Incomplete College	5 (5.1%)
Complete College	5 (5.1%)
<b>Marital Status</b>	
Married	42 (43%)
Divorced	6 (6.1%)
Single	50 (51%)
<b>Race</b>	
White	15 (15%)
Brown	43 (44%)
Black	40 (41%)

In Table 2 presented below, a cross-tabulation of positive and negative responses for the presence of urinary incontinence was performed. Statistically significant associations were observed between not having urinary incontinence and not being a smoker ( $p=0.025$ ). This suggests that patients who reported not smoking are less likely to have urinary incontinence, as well as patients who had never undergone vaginal delivery previously ( $p=0.006$ ). In the sample group of this study, there was no statistical significance between age, regular physical activity, BMI, and race with the presence of UI.

**Table 2** - Association between urinary incontinence and investigated variables (n = 98)

Characteristic	No, N = 63	Yes, N = 34	p Value
<b>Age</b>	30 (25, 34)	28 (24, 35)	0.6
<b>Gestational Age</b>	31 (26, 35)	33 (27, 35)	0.5
<b>Regular Physical Exercise</b>			0.7
No	47 (49%)	24 (25%)	
Yes	15 (16%)	9 (9.5%)	
<b>Smoking</b>			<b>0.025</b>
No	52 (54%)	26 (27%)	
Yes, quit during pregnancy	5 (5.2%)	8 (8.2%)	
Yes, currently smoking	6 (6.2%)	0 (0%)	
<b>Megan BMI</b>	29 (26, 35)	30 (25, 35)	>0.9
<b>Previous Vaginal Delivery</b>			<b>0.006</b>
No	36 (41%)	10 (11%)	
Yes, one	12 (14%)	14 (16%)	
Yes, two	2 (2.3%)	5 (5.7%)	
Yes, three or more	7 (8.0%)	2 (2.3%)	
<b>Race</b>			0.3
White	12 (12%)	3 (3.1%)	
Brown	28 (29%)	15 (15%)	
Black	23 (24%)	16 (16%)	

Figure I illustrates the graphical presentation of responses from all interviewed pregnant women regarding their overall health perception, where they could respond with very good, good, fair, poor, or very poor to describe their current health. As can be observed, among patients with urinary incontinence, 9% of respondents rated their current health as “poor” or “very poor.” Among patients with urinary incontinence, approximately 38% described their current health as fair. In contrast, among negative responses for urinary incontinence, 71% answered “good” or “very good” for overall health perception, indicating a deterioration in the overall health perception of patients with urinary incontinence.

Finally, the KHQ is divided into domains listed in Table 3 below, with Likert-type scales, graded in four response options (“not at all, slightly, moderately, very” or “never, sometimes, frequently, all the time”), except for the domains overall health perception with five response options (“very good, good, fair, poor, very poor”) and personal relationships (“not applicable, not at all, slightly, moderately, very”). Scoring is done for each domain, with scores ranging from 0 to 100, and the higher the score, the worse the quality of life-related to that domain. When applying the entire KHQ questionnaire only to positive responses for urinary incontinence, it was observed that among the 34 patients, only 5 (15%) of them responded that bladder problem does not affect their quality of life at all, while 38% responded that it affects slightly, 26% moderately, and 21% very much. Sleep and energy were two of the domains that most interfered with the evaluation of the quality of life in pregnant women, as only 12% responded “never” for this domain, indicating that the bladder problem usually interferes with sleep and energy, with an average of responses equivalent to 55.88.

Figure 1 - Overall Health Perception in patients with and without urinary incontinence (n = 98).

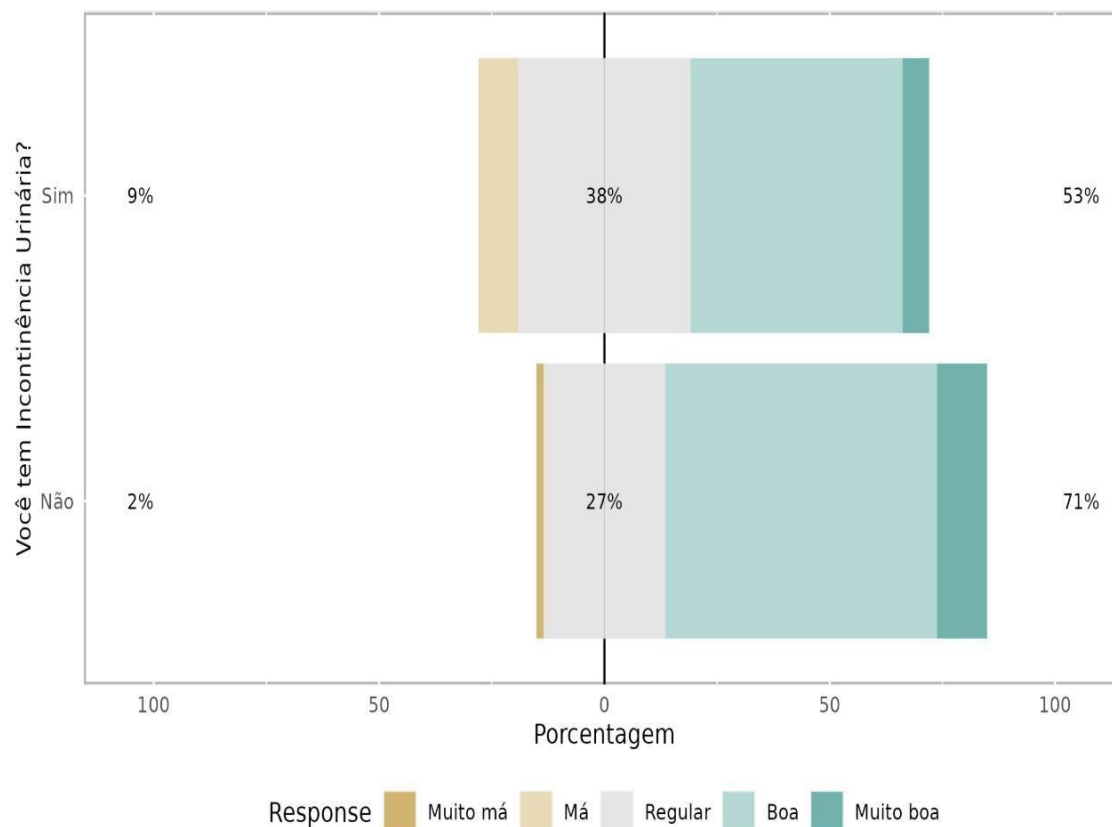


Table 3 - Score values\* obtained for each domain of the KHQ

	Median	SD	Mean	Minimum/ Maximum
<b>Overall health perception</b>	37,5	18,72	25	0-100
<b>Impact of Incontinence</b>	50,98	33,06	33,33	0-100
<b>Limitations in daily, physical, and social activities</b>	34,51	32,6	23,33	0-100
<b>Personal relationships</b>	21,18	29,21	11,11	0-100
<b>Emotions</b>	26,47	30,21	11,11	0-100
<b>Sleep and energy</b>	55,88	30,12	58,33	0-100
<b>Severity measures</b>	38,56	24,5	33,33	0-100

\*Scores calculated according to Paula A, Rocha R. Universidade Federal de São Carlos Centro de Ciências Biológicas e da Saúde Departamento de Fisioterapia Programa de Pós-graduação em Fisioterapia KING'S HEALTH QUESTIONNAIRE: propriedades de medida e índice baseado em preferência de mulheres com incontinência urinária. São Carlos-sp 2022 [Internet]. Available from: [https://repositorio.ufscar.br/bitstream/handle/ufscar/16599/ROCHA\\_Ana\\_2022.pdf?sequence=6&isAllowed=y](https://repositorio.ufscar.br/bitstream/handle/ufscar/16599/ROCHA_Ana_2022.pdf?sequence=6&isAllowed=y)

## DISCUSSION

The present study aimed to understand the risk factors associated with urinary incontinence and its impact on the quality of life of pregnant women with urinary symptoms. The factors evaluated included age, gestational age, regular physical activity, smoking, BMI, vaginal delivery, and race.

The results of the present study did not identify statistically significant associations between age, gestational age, regular physical activity, BMI, and race, all with  $p$ -values  $> 0.05$ . This could be explained by the small sample size, which did not allow for a minimum clinical differentiation for statistically significant values.<sup>9</sup>

Although there was no statistical significance in the sample, urinary incontinence is strongly associated with overweight and the burden that the gravid uterus itself places on the pelvic floor. One reason for the association between obesity and UI is that increased abdominal fat increases pressure on the pelvis, facilitating involuntary urine loss. Therefore, it is important to emphasize the importance of adequate guidance to women regarding appropriate weight gain during pregnancy. Additionally, as observed in a study, weight loss and regular physical activity can reduce incontinence and should be a focus of the therapeutic approach.<sup>10,11,12</sup>

Regarding smoking, the present study found a significant association between never having smoked and not having urinary incontinence. The association between smoking and urinary incontinence possibly arises from the fact that regular smokers tend to cough chronically, leading to increased abdominal pressure. Additionally, nicotine and carbon monoxide reduce circulating estrogen levels. This result is consistent with other similar studies that associate tobacco use as an independent risk factor for the development of UI in pregnant

women, which further emphasizes the importance of encouraging patients to quit smoking.<sup>13,14</sup>

Among the 34 pregnant women interviewed who had a positive response to the presence of urinary incontinence, 21 of them had previously had vaginal delivery. A recently conducted prospective cohort study in Peru observed that women with vaginal delivery have a higher risk of stress urinary incontinence than patients undergoing cesarean section. In this study, women who had a vaginal delivery had an 8% to 12% higher risk of developing UI and pelvic organ prolapse when compared to women undergoing cesarean section.<sup>15,16,17</sup>

Regarding the quality of life, among the 34 pregnant women who had a positive response to the urinary incontinence condition, the impact on quality of life-related to bladder issues was considered moderate. This aligns with the literature and other studies evaluating urinary incontinence in women. A recently published study conducted in Brazil, which also used the KHQ, presented similar results, identifying a negative impact on the quality of life of women with UI, especially regarding the impact of UI on sleep and disposition.<sup>18,19,20</sup>

The study has methodological limitations. Being a cross-sectional study, associations between variables do not imply causality, given the impossibility of directly assessing temporality or dose-response relationship, following Hill's criteria. Additionally, the diagnosis of urinary incontinence and other information were based on self-report, which may affect the accuracy of the data. Furthermore, data collection occurred in the maternity waiting room, an environment with little privacy, which may have underestimated the results. It is also pertinent to note that the study did not follow the STROBE guideline, compromising the transparency and reliability of the results. Finally, as the research was conducted in a high-risk

maternity ward, with most patients evaluated late in pregnancy, its results may not be generalizable to the general community due to the selection bias of the sample group. However, the study reflects the reality of many public maternity hospitals located in low socioeconomic areas. Additionally, it is important to mention that the quality-of-life questionnaire (QoL) employed, the King's Health Questionnaire, is one of the instruments recommended by the European Association of Urology for screening urinary incontinence in women. Its validation for the Brazilian population makes it a reliable resource for evaluating quality of life in clinical research involving women with urinary incontinence, further aligning this study with clinical practice.<sup>21,22,23</sup>

## CONCLUSION

This study concluded that factors such as smoking and vaginal delivery are considered important triggers for urinary incontinence during pregnancy. Furthermore, it was identified that involuntary urine loss negatively impacts the quality of life of pregnant women, resulting in a deterioration of overall health perception.

Finally, considering the significant impact of urinary incontinence on the quality of life of women during the perinatal cycle, conducting prospective cohort studies becomes relevant. These would allow for a longitudinal and more detailed analysis of the incidence of urinary incontinence and its risk factors. Additionally, conducting comparative studies investigating the relationship between socioeconomic status and the prevalence of urinary incontinence may provide important data on the social determinants involved in this issue. Another approach would be to investigate possible modifiable risk factors and methods for the prevention and treatment of pelvic floor dysfunctions, aiming to enhance public health and clinical strategies to deal with this common and impactful problem.

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THE AUTHORS DECLARE THAT THERE IS NO CONFLICT OF INTERESTS IN RELATION TO THIS ARTICLE.

