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Urinary Incontinence after Childbirth: Prevalence, Risk Factors and Impact on Quality of Life in Portuguese Women

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ABSTRACT

Background & aim: Urinary incontinence (UI) significantly impacts quality of life, with pregnancy and childbirth recognized as major risk factors. This study aimed to identify the prevalence and risk actors of UI and its impact on quality of life among women after childbirth.

Methods: A cross-sectional study using stratified cluster sampling was conducted on 696 women in Portugal, who had a childbirth within the last 12 months. Data were collected via a demographic as well as ICIQ-UI SF and (ICIQ-LUTSQoL questionnaire, which distributed on Facebook, LinkedIn, and Instagram between September 2019 and February 2020. Data analysis was performed using SPSS version 27, employing chi-square or Fisher's exact tests and a multiple logistic regression model to identify factors related to postpartum UI.

Results: The prevalence of UI after childbirth was 46.8%. Factors significantly associated with UI included involuntary urine loss before and during the last pregnancy, type of delivery, and age. The risk of postpartum UI was doubled with the use of forceps or vacuum (OR = 2.06) and was lower in C-section deliveries. Women over 34 years had an increased risk, nearly twice as high (OR = 1.93; 95% CI 1.2–3.1). The average score of quality of life was 37.7±۹/۲۴ with a minimum of 22.00 and a maximum of 70.00.

Conclusion: This study sheds light on the prevalence and risk factors of postpartum UI, emphasizing the need for prenatal monitoring and preventive protocols to mitigate the impact of this condition on childbearing women's lives.

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Introduction

Urinary incontinence (UI) is a health issue with strong impacts on quality of life (1). The International Continence Society (ICS) defines UI as a complaint about involuntary urine losses (2), more common in women than in men (3). The global prevalence of UI varies considerably. A 3.3% increase has been predicted, globally, from 2008 to 2018, including all age groups and estimating that nearly 200 million people around the world will be affected by this condition (4-6).

Urinary incontinence is unanimously seen as a common situation, which affects women from all ages, ethnicities, and cultures. Even though this condition affects, regardless of age, men and women, with important implications on their quality of life at a physical, psychological, emotional and social level, women are more affected, showing higher prevalence. Pregnancy, childbirth and the anatomy of the female pelvic floor itself contribute as risk factors (7-9).

Despite not being a life-threatening condition, UI has a negative impact on quality of life, requiring changes in daily life habits, physical activity, social interaction, self-esteem, self-concept and psychological wellbeing (10).

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Pregnancy, childbirth and puerperium lead to changes and adaptations in the pelvic structures. Mechanical and hormonal factors contribute to alterations on the level of the urinary tract, creating the conditions for the appearance of urinary symptoms. During pregnancy and puerperium, hormone changes and changes in the pelvic floor associated to childbirth are important risk factors for the development of UI in women. The post-partum period causes organic and psychological adaptations and changes, and UI is a harmful situation that conditions the experience of maternity itself.

For the postpartum period, Thom et al. (2010), along with other authors, indicate prevalence rates of UI between 27% and 34% (11-13). Other studies point to a prevalence of UI after childbirth between 20% and 27.5% in the age group between 17 and 45 years old (14-15).

Urinary incontinence leads to stigmatisation in most populations. This contributes for a low search for health care and to a greater likelihood of biased responses in observational studies (16).

Estimates suggest that nearly 50% of adult women can experience UI (17-18). This prevalence increases with age, affecting from 10% to 20% of adult women. Despite its high prevalence, UI continues to be underdiagnosed and undertreated as estimates indicate that only 25% of women affected search medical care to deal with this condition (18-19).

Urinary incontinence can be triggered by several factors and can affect women of all ages, with a large impact on the quality of life and high psychological and financial costs. The fact that women present incontinence from six weeks to three months after childbirth means that there is a high likelihood for this condition to continue or even become worse (20-22).

Studies consider UI to be a worldwide problem, with high economic, psychological and social costs. Only 25% of women with UI search for health care. Less than half of these women take effective care of their incontinence issue (23-25).

Knowing the worldwide prevalence of this condition has uncovered its dimension and its impact on the lives of women, not only as an important sanitary problem but also as a social issue. It is not only important to know the dimension of this issue and its impact on the quality of life of the Portuguese female population, but also to understand the risk factors in the post-partum period, as this knowledge would contribute to elaborate an approach to provide care by identifying women who are more likely to develop this condition and those who already have it. This, in turn, would enable the implementation of interventions that allow preventing, improving, or reverting this condition, making it possible to improve the quality of life of these women. This study also will contribute to the current knowledge about the dimensions of UI. This aim is to enable the implementation of preventive programmes by health workers, including maternity healthcare providers involved in maternal and obstetric care, who monitor these women in the different stages of their lives and, especially, during pregnancy, childbirth and postpartum.

However, in Portugal, we do not know the prevalence of this condition after birth and its risk factors. Hence, we aimed to conduct this study to identify the prevalence and risk actors of UI and its impact on quality of life among women after childbirth.

Materials and Methods

This was a quantitative cross-sectional study involving participants who accepted responding to a Qualtrics questionnaire advertised on the social networks of Facebook, LinkedIn and Instagram. The target population included Portuguese women who had a childbirth one year ago. Access to the administrative area of Qualtrics was obtained through a safe call, using credentials whose sole responsible was the Interdisciplinary Health Research Center at the Universidade Católica Portuguesa.

The sample size was calculated considering the European incontinence prevalence of 21.3% associated to delivery (28- 30), an error of 5% and a confidence interval of 95%, while also attending 2018 PORDATA for a minimum of 258 participants. The inclusion criteria for the participants were being Portuguese, 18 years old or older, having birthed a child up to 1 year prior to accessing the questionnaire and having had a pregnancy with 37 weeks gestational age or longer. The exclusion criteria included having

given birth to twins, other urological diseases or previous urological surgery.

Data collection was performed using a three-part questionnaire. The first part included questions to characterise the sample, addressing different risk factors including: smoking habits, caffeine intake, number of pregnancies, type of delivery, involuntary urine loss before and during the last pregnancy, newborn birth weight, Kristeller maneuver and episiotomy, that emerged from the literature and from the analysis of a focus group made up of three experts in the field, who contributed to the construction of the questionnaire. The second part was constituted by the ICIQ-UI SF (International Consultation Questionnaire on Urinary Incontinence- Short Form) questionnaire, which was translated and validated and allows assessment of urinary incontinence and its characterization. The questions are simple and without cultural content, with scores from 0-21 where zero means that there is no urine loss and 21 refers to the most serious situation. The third part was the ICIQ-LUTSQoL (International Consultation on Incontinence Questionnaire Urinary Incontinence Quality of Life Module) questionnaire., which allows us to assess the impact of urinary incontinence on quality of life.

It includes 22 simple questions, distributed in eight domains that allow the evaluation of UI impact on the quality of life in its different dimensions. The score is added up in each of the domains, ranging from 0 to 100, where the higher the score, the worse the quality of life related to that domain. These tools were validated to the Portuguese population in a previous study with a Cronbach's alpha, with a value of 0.85, for the ICIQ-UI SF and a global score of 0,906 for the ICIQ-LUTSQoL (26-27).

Data collection took place from September 2019 to February 2020. Each computer was only allowed to access the questionnaire once, preventing repeated accesses by the same terminal. Only completed questionnaires were considered.

We used the STROBE Checklist items to provide the report of this cross-sectional study.

To analyse data, the data were organised in a database, which was directly exported to a file in the Statistical Package for the Social Sciences (SPSS) for Windows, version 27.0. Qualitative variables were described using relative (%) and absolute frequency. Quantitative variables were described using mean, median and standard deviation. To analyse the association among qualitative variables, we used the chi-squared test or, when adequate, Fisher's exact test. To ascertain the factors related to the presence of UI after delivery, we used a multiple logistic regression model. We calculated the odds ratio and a confidence interval of 95%. The significance level for statistical tests was 0.05.

Results

In total, 1,231 participants accessed the questionnaire. After applying the inclusion and exclusion criteria, the final sample was composed of 696 participants, all Portuguese women who had given birth within the last 12 months, with a response rate of 56.2%.

Table 1. Frequency distribution of participants by level of education and nutritional status

Level of education	N (%)
1º- 4º year	2 (3)
5º - 9º year	16 (2.3)
10º - 12º year	153 (22.0)
Bachelor's Degree/	270 (38.8)
Postgraduate/Masters/Doctorate	255 (36.6)
Total	696 (100.0)
BMI	
<18.49	15 (2.2)
18.5-24.99	355 (51.0)
25-29.99	225 (32.3)
30-34.99	71 (10.2)
>35	25 (3.6)
Total	691 (99.3)

In this sample, 324 participants mentioned having had UI, indicating a prevalence rate of 46.8%. Regarding the frequency of urinary incontinence, 147 (45.4%) stated a frequency of once a week or less, 88 (27.2%) stated that they had incontinence twice or three times a week, 47 (14.5%) mentioned once a day, and 42 (13%) were incontinent several times a day. Regarding the amount of urine loss in each episode, 12 (3.7%) stated to lose none, 287 (88.6%) mentioned a small amount, 19 (5.9%) reported a moderate amount and 1 (0.3%) a large amount.

The mean age found in this sample was 33.6 (SD = 4.8) years, with a median of 34, a minimum of 18 and a maximum of 45 years. Regarding the educational level, we found a positive asymmetrical distribution regarding the educational level, suggesting that most women with UI had finished graduation or post-graduation. Also, the mean weight of the participants was 68.09 kg (a minimum of 42 kg and a maximum of 128 kg). The body mass index (BMI) was calculated using the values for weight and height, and the data were grouped. The distribution according to the nutritional state was symmetrical, with 43.5% of the participants with UI presenting a normal BMI (Table 1).

We found no statistically significant relationship between coffee consumption and UI. In terms of obstetric history, considering the number of pregnancies, among those who had been pregnant once or twice, 55.5% reported not being incontinent. However, the association between number of pregnancies and UI was not statistically significant (Table 2).

Table 2. Frequency distribution of participants incontinent in relation to smoking habits, caffeine intake and pregnancy history

Variable	Not incontinent	incontinent	P-Value
Being Smoker smoke regularly (one or more cigarettes a day)	**N (%)**	**N (%)**	0.376
Yes	109 (50.9)	105 (49.1)	
No	263 (54.6)	219 (45.4)	
Drinking coffee regularly (one or more coffees a day)			0.408
Yes	217 (52.2)	199 (47.8)	
No	155 (55.4)	125 (44.6)	
Number of pregnancies			
1 or twice	319 (55.5)	256 (44.5)	0.222
3 or more	53 (43.8)	68 (56.2)	

By studying the factors that influence the presence of UI after childbirth, we found that incontinence before pregnancy was a risk factor for UI after delivery. Overall, 15.8% women had incontinence before pregnancy. Of this group, 23.6% stated having UI at the time of the study, whereas 76.4% had experienced incontinence after childbirth. The chi-squared test showed a statistical association, with $p < 0.001$, when comparing those who had presented incontinence before pregnancy and those who did so after childbirth. Presenting UI before pregnancy is a risk factor for its presence after delivery. Having UI during pregnancy is also an influence factor for presenting this condition after birth. We found that of the 329 women (47.3%) who had had UI during their last pregnancy, 205 (62.3%) also had it after childbirth and continued to be incontinent. The chi-squared test showed a statistically significant association, with $p < 0.001$, between UI during pregnancy and after delivery (Table 3).

Table 3. Frequency distribution of participants with incontinence before pregnancy and during pregnancy

Variable	Not incontinent	incontinent	P-Value
History of urinary incontinence before last pregnancy	**N (%)**	**N (%)**	<0,001
Yes	26 (23.6)	84 (76.4)	
No	346 (59.0)	240 (41.0)	
History of urinary incontinence during last pregnancy			
Yes	124 (37.7)	205 (62.3)	<0.001
No	248 (67.6)	119 (32.4)	

Respecting the type of delivery, 46.0% had had a normal delivery, 49.1% reported UI.

Table 4. Frequency distribution of urinary incontinence cases per mode of delivery.

Variable	Not Incontinent	Incontinent	Total	P-Value
Mode of delivery				
Normal	163 50.9%	157 49.1%	320 100.0%	<0.001
Suction cups/forceps	63 38.0%	103 62.0%	166 100.0%	<0.001
C-section	146 69.5%	64 30.5%	210 100.0%	<0.001
Total	372 53.4%	324 46.6%	696 100.0%	

Table 5. The results of Multiple Logistic Regression Model

Variable	OR	CI95%		P-Value
		Lower	Upper	
No	Reference			
Yes	1.08	0.75	1.55	0.696
Drinking coffee regularly (one or more coffees a day)				
No	Reference			
Yes	0.88	0.62	1.24	0.461
History of urinary incontinence before last pregnancy?				
No	Reference			
Yes	3.76	2.21	6.40	<0.001
History of urinary incontinence during last pregnancy?				
No	Reference			
Yes	2.66	1.89	3.76	<0.001
Mode of delivery				
Normal	Reference			
Suction cups/forceps	2.06	1.36	3.12	0.001
C-section	0.46	0.30	0.68	<0.001
Age group				
Up to 30 years old	Reference			
30–34	1.43	0.89	2.31	0.139
>34	1.93	1.20	3.10	0.007
Type of pregnancy				
Primigravida	Reference			
Multigravida	0.84	0.58	1.21	0.345
Infant weight (g)				
Up to 2,499	Reference			
2,500–3,500	0.69	0.24	2.01	0.499
>3,500	0.78	0.26	2.32	0.651
Fundal pressure during delivery				
No	reference			
Yes	1.27	0.81	2.01	0.300
Episiotomy during delivery				
No	Reference			
Yes	1.04	0.67	1.63	0.849

A total of

166 participants reported having had a delivery aided by forceps or suction cups, and among these, 62.0% reported UI. Of the 210 who had had a C-section, 30.5% reported UI. The chi-squared test showed a statistically significant association, with $p < 0.001$.

We therefore conclude that the type of birth is a factor that influences the presence of UI after childbirth (Table 4).

To ascertain the factors that can explain the presence of UI after childbirth, we used a multiple logistic regression model. In this model, we considered risk factors calculating the odds ratio (OR) and its respective confidence interval of 95%, with a significance level of 5% (Table 5).

When childbirth had been carried out using suction cups or forceps, the risk for incontinence after birth was doubled, with OR = 2.06. In contrast, C-sections presented an OR = 0.46, showing a reduction of the likelihood of UI after delivery. In relation to age, ageover 34 years was associated with an increased risk of incontinence, approximately twice as high (OR = 1.93; 95% CI 1.2–3.1) compared to that of the younger age groups. The factors being a smoker, caffeine intake, type of pregnancy, newborn weight, episiotomy and Kristeller manoeuvre were not associated with the presence of UI after birth.

The impact of UI on quality of life assessed by the ICIQ-LUTSQol instrument, which allowed us to identify which aspects of their life's urinary incontinence, has the greatest impact on the participants who completed this questionnaire.

The total score for the ICIQ-LUTSQol questionnaire ranged from 0 to100, with values closer to 100 indicating a greater impact on quality of life. The average score was 37.7, with a standard deviation of 9.24, a minimum of 22.00 and a maximum of 70.00.

In this study, among the women who reported involuntary urine leakage, 59.8% stated that urinary incontinence did not affect their work performance, while 30.4% felt it slightly affected their performance. Additionally, 58.3% of the women did not report their urinary incontinence issue to a nurse or doctor, while 41.7% communicated their problem to a healthcare professional. The frequency of urine leakage is associated with a lower quality of life. Even when urine leakage occurs once a week, it is considered to have a significant impact on quality of life by 18.8% of women. However, when urine leakage occurs several times a day, the impact is more pronounced, with 63.6% indicating that this situation has a major impact on their quality of life. The need to change clothes whenever wet due to urinary incontinence was a frequent or constant need for 63.6% of women, with 64.3% of women frequently or constantly worrying about the possibility of smelling bad, which has a significant impact on quality of life. Women who experience urinary incontinence have their quality of life affected in various ways, depending on the severity of the problem and their professional activity or area of interest.

Discussion

The prevalence of UI estimated in this study is in accordance with the findings of other studies. For example, Leroy et al. (2016) reported a prevalence of 45.5% (31) of stress UI in a sample of 344 women in their puerperium, whereas Cerruto et al, (2013) reported, in a systematic review including 17 studies carried out in Europe, a prevalence from 14.1% to 68.8% among women (32). Mørkved & Bø (1999), in their study, which lasted 1 year and involved 144 women, evaluated women for a period of 8 weeks after childbirth and found a UI prevalence of 38% (33). Nonetheless, our value regarding the prevalence of UI after birth is higher than the prevalence estimated in other studies, such as in a study by Burgio et al (2003), with 523 women, whose prevalence for UI was 11.4% over a period of 6 weeks after delivery. However, the prevalence after 12 months was 13.3% (34), with 59.6% of UI occurring during pregnancy, which decreased to 11.4% at 6 weeks after delivery. Schytt et al (2004), studying a sample of 2,390 women, also presented a prevalence of 22% of UI 1 year after delivery (35).

The findings of this study showed that urinary incontinence before pregnancy increases the likelihood of having incontinence after delivery, with a 3.7 higher risk). This fact may be related to the data collection procedure. The total estimated prevalence up to 1 year after birth, including all situations from 3 to 6 months after birth. Another reason may be related to the fact

that in Portugal, childbirth is still highly medicalised.

Gartland et al. (2012) mentions the presence of UI before pregnancy as a risk factor for incontinence after childbirth, with 44% of women having presented incontinence 4 to 18 months after delivery; the author also shows that women who had incontinence before pregnancy were 7 times more likely to develop it afterwards (36). The presence of UI during pregnancy also increased the likelihood of incontinence in postpartum period. In this study, 62.3% of women who experienced incontinence after birth had had it during pregnancy was healthy. The risk for incontinence afterwards was 2.7 times greater. This has been reported in other studies, such as that by Diezt-Itza et al. (2010), who carried out a study on primigravida's 1 year after delivery, where the presence of incontinence during pregnancy increased five times the risk of having UI afterwards (37). A study by Wesnes et al. (2017), also including primigravida's, showed that the presence of UI during pregnancy increased 2.3 times the risk for incontinence 6 months after delivery.

Regarding increased risk of Ui during and after pregnancy, it could be argued that organic adaptations associated with pregnancy, including hormonal alterations, could change the ligaments and anatomical structures of the pregnant women. The pelvic region is also altered by conditions associated with pregnancy, with more flaccid ligaments and muscles related to hormonal actions. These physiological pregnancy changes pave the way for UI, especially during the third trimester (38).

The type of childbirth was a factor associated with the presence of UI after delivery. The results of this study suggest that the use of suction cups or forceps increases two-fold the likelihood of UI after delivery, whereas the likelihood for this event is 0.46 when childbirth takes place through a C-section, showing that the C-section has the least negative effect. Gartland et al. (2016) reported that C-sections significantly decrease the likelihood of UI 4 years after delivery when compared to normal childbirth (39). Similarly, Erenel et al. (2022) reported that childbirth is a risk factor for UI, with the likelihood of incontinence after vaginal deliveries being higher than that after C-sections. (40) However, there are not sufficient studies that prove that vaginal birth increases the chances of UI, and there are no studies that prove the difference in the prevalence of UI with vaginal birth compared to that with elective C-section (41).

Based on our results, in Portugal, UI is highly prevalent in the postpartum period. This reinforces the assumption that urine loss before and during pregnancy is a predisposing factor for UI after birth, along with the mode of delivery, considering the use of forceps and suction cup compared to C-section.

One of the limitations of this study was taking place of data collection at the end of 2019 and throughout 2020, in the context of a pandemic, which conditioned our possibilities of data collection. The data were collected online, which limited the possibility of verifying the evolution of urine loss beyond one year after birth. These difficulties were associated with the process of addressing the potential participants of the study. Another limitation of the study was related to the fact it does not include a random sample of participants, based on the data collection procedure.

We believe that the research carried out allowed us to obtain results that are relevant to the population studied, hoping that it will be an incentive for the continuation of research in this area in Portugal with implications for maternity practice.

Conclusion

Based on the associated risk factors of UI determined in this study, history of UI before and during pregnancy, as well as the mode of delivery and being older than 34 years old, contribute to incontinence after childbirth, making it possible to identify women that will be at greater risk of losing urine during their follow up and pregnancy monitoring. Our results indicate a set of factors that can lead to further investigations to increase evidence regarding the risk factors for the development of UI after childbirth. They also show that maternity healthcare professionals can be the link for needed multidisciplinary interventions.

Considering our results, and performing evidence-based practice, we need to invest in prevention and intervention to minimise the

problem of involuntary urine loss after delivery, acknowledging it during maternal health consultations in primary health care (pre- and post-partum). It is also necessary to boost the presence of this topic in teaching and incorporating it in graduation or in specialisation and post-graduation courses. Similarly, it will be essential to consider it in occupational health activities.

Declarations

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The authors would like to appreciate the women who participate in the study.

Conflicts of interest

The authors declared no conflicts of interest.

Ethical Considerations

Confidentiality and anonymity were guaranteed as we asked for no information that could identify the participants.

Code of ethics

The Ethics Committee of the Universidade Católica Portuguesa approved the execution of the study under opinion No. 73 during the 18th meeting of CES-UCP.

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Authors' contribution

MG and PA participated in the design of the study, analysis, and draft of the manuscript. MG carried out the data collection; MG and PA interpreted the data; MG drafted the manuscript. All authors read and approved the final manuscript.

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