Braz J Phys Ther 29 (2025) 101184

Contents lists available at ScienceDirect

Brazilian Journal of Physical Therapy

journal homepage: www.elsevier.com/locate/bjpt

Original Research

Association between contextual factors and vulvovaginal symptoms in Brazilian women: A cross-sectional study

Clara Maria de Araujo Silva [a], Tatiana de Oliveira Sato [a], Vanessa Patrícia Soares de Sousa [b], Natália Duarte Pereira [a], Daiana Priscila Rodrigues-de-Souza [c], Ana Carolina Sartorato Beleza [a,*]

[a] Postgraduate program in Physical Therapy, Physical Therapy Department, Universidade Federal de São Carlos, São Carlos, São Paulo, Brazil
[b] Universidade Federal do Rio Grande do Norte, Santa Cruz, Rio Grande do Norte, Brazil
[c] University of Cordoba, Córdoba, Andalusia, Spain

ARTICLE INFO

Keywords:
International classification of functioning, disability and health
Pelvic floor disorders
Women's health

ABSTRACT

Background: The International Classification of Functioning, Disability and Health widens the understanding of the individual by considering contextual factors for health. Regarding the health of women, vulvovaginal symptoms (e.g., itching, burning, pain, irritation, dryness, and vaginal odor) need consideration.
Objective: To verify the prevalence of vulvovaginal symptoms, their association with contextual factors, and evaluate their impact on the emotional well-being, quality of life, and sexual function of Brazilian women.
Methods: This cross-sectional study was conducted from October 2021 to August 2022 using Brazilian women aged 18 or older. Health and sociodemographic data were collected, and the women were divided into two groups according to the Vulvovaginal Symptoms Questionnaire: with and without vulvovaginal symptoms. The association between contextual factors and vulvovaginal symptoms was verified using logistic regression.
Results: The study included 313 women (34 ± 11.5 years), physically active (71%), non-smokers (9%), and employed (72%). Of those, 227 (72.5%) presented vulvovaginal symptoms. Low educational level and no pregnancy were associated with vulvovaginal symptoms. The most prevalent symptoms were vaginal discharge (63.4%) and itching (54.6%).
Conclusion: The results indicated that vulvovaginal symptoms are prevalent in Brazilian women. Thus, developing effective care and disseminating knowledge about vulvovaginal symptoms, causes, and treatment, are important to improve health care in Brazilian women.

Introduction

Vulvovaginal symptoms include itching, burning, pain, irritation, dryness, and vaginal odor that can adversely affect women's health. These symptoms may be caused by infections, dermatological and/or hormonal changes, as well as lifestyle habits such as wearing non-breathable clothing. In terms of their consequences, these symptoms can negatively impact women's emotional well-being, quality of life, and sexual function. Their presence can result in changes in social participation and self-confidence, among other aspects.[1-3]

The prevalence of these symptoms was found to be 51.1% in a study conducted with post-menopausal American women. An impact due to the presence of these symptoms was observed across the other evaluation subscales of the instrument when there was a positive response to the presence of at least one symptom.[4] However, data regarding prevalence in Brazilian women and in a younger population remain scarce. These symptoms could be assessed using the Vulvovaginal Symptoms Questionnaire (VSQ) which consists of 21 items divided into four scales: symptoms, emotions, life impact, and sexual impact.[1-3]

When assessing individuals' health conditions, the International Classification of Functioning, Disability, and Health indicates an interaction between aspects of body structure and function, activity, participation, and contextual factors.[4] Contextual factors can be environmental, considering the place of residence (time, territory, and societal interference), and social behavior, which encompasses societal norms and interpersonal relationships. Additionally, personal factors include individual aspects such as age, educational level, lifestyle, and occupation.[4-6]

These factors can either protect or pose risks to an individual's health, and this applies to women's health as well. Older age, lower

* Corresponding author at: Department Physical Therapy Department, Federal University of São Carlos, Brazil.
E-mail address: acbeleza@ufscar.com (A.C.S. Beleza).

https://doi.org/10.1016/j.bjpt.2025.101184
Received 7 August 2023; Received in revised form 16 April 2024; Accepted 29 January 2025
Available online 27 February 2025
1413-3555/© 2025 Associação Brasileira de Pesquisa e Pós-Graduação em Fisioterapia. Published by Elsevier España, S.L.U. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

educational level, lower socioeconomic status, working outside the home, and having more than two children are predictive factors for health issues in women.[7] These factors can affect conditions like urinary incontinence (UI), sexual dysfunction, and menopause, and can influence health habits during pregnancy.[7-11]

Although studies have examined the effects of these factors on vulvovaginal symptoms, the relationship between contextual factors and vulvovaginal symptoms has not yet been adequately explored in the scientific literature. Therefore, this study aimed to verify the prevalence of vulvovaginal symptoms, their association with contextual factors, and evaluate their impact on the emotional well-being, quality of life, and sexual function of Brazilian women. This information could contribute to structuring prevention and symptom reduction measures, and understanding the role of contextual factors in vulvovaginal symptoms.

Methods

Study design

This quantitative cross-sectional study was conducted online from October 2021 to August 2022 and was approved by the Research Ethics Committee of the Federal University of São Carlos, located in São Carlos, São Paulo, Brazil, under CAAE: 27822120.7.0000.5505. All participants received an informed consent form in which they recorded their agreement to participate in the study. The study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[12]

Participants

The participants were recruited online via sponsored and unsponsored posts on the research laboratory's social media profiles on Facebook and Instagram, and through WhatsApp groups where the researchers were members for dissemination purposes. Subsequently, participants were categorized into two groups: those with and without vulvovaginal symptoms. This categorization was based on their responses to items in the first subscale of symptoms, covering questions 1 to 7, where a score of 0 indicated 'no' and 1 indicated 'yes.' The presence of vulvovaginal symptoms was determined by at least one affirmative response.

According to Field,[13] a sample size of 10 to 15 participants per variable is recommended for inclusion in a regression model.[13] Therefore, the sample size for this study should have ranged between 200 and 300 participants, determined based on the number of variables present in the Vulvovaginal Symptoms Questionnaire (VSQ-Br). Considering that the number of participants reached (313), this reflects a medium to high effect size and 80% power in conducting logistic regression analysis.

Instruments

Sociodemographic, gynecological-obstetric and health data form

This form was prepared by the researchers, and included personal data such as age, socioeconomic data evaluating occupation (1. Working and 2. Not working) and demographic data such as educational level (1. Middle and high school and 2. Higher education) and marital status (1. Single and 2. Married/stable union). Regarding gynecological-obstetric data, participants were asked about the use of contraceptive methods, gynecological surgery, sexual intercourse in the last 4 weeks, menopause, and urinary incontinence, with yes or no answers to each of the questions. For pregnancies, participants selected "none" or "one or more". Finally, for health in general, the practice of physical activity and smoking were evaluated based on the participants' reports, indicating yes or no to these questions.

VSQ-Br

The translated and validated Brazilian version of the VSQ was used to assess vulvovaginal symptoms.[3] This self-administered questionnaire has 21 yes (1) or no (0) questions divided into four scales: symptoms, emotions, life impact, and sexual impact. Questions one to seven are related to the symptoms scale, in which a single affirmative answer defines vulvovaginal symptoms.[1-3] The score ranges from 0 to 16 for sexually inactive women and 0 to 20 for sexually active ones. Question 17 differentiates sexually active from inactive women and is not included in the score. High scores indicate more emotional, quality of life, and sexual impact of vulvovaginal symptoms on women.

Data analysis

To analyze the results, the normality of the data was checked using the Q-Q plot. Mean, standard deviation, and absolute and relative frequencies were calculated, and the variables are specified in Table 1.

Sociodemographic data from groups were compared using the *t*-test for independent samples (continuous variables) or the chi-square test (categorical variables).

The association between contextual factors and vulvovaginal symptoms was first assessed using the chi-square test. The variables that were associated with each other with $p < 0.20$ were included in the logistic regression model, so that variables that could be potentially significant were not excluded before being evaluated[14] using the stepwise forward method. The Statistical Package for the Social Sciences (SPSS, version 22.0) software was used to determine odds ratio (OR) 95% confidence interval (CI), and R^2.

Results

Table 2 presents the sample characteristics and bivariate analysis

Table 1
Measurement, classification, and analysis of variables.

Variable	Measurement	Classification	Type of variable in the regression analysis
Contextual factors			
Age	In years	Quantitative/ independent	Factor
Educational level	In level	Quantitative/ independent	Factor
Marital status	Marital status report	Categorical (single or married/stable union)/independent	Factor
Physical activity	Presence or absence	Categorical (yes or no)/independent	Factor
Smoking			
Urinary incontinence			
Contraceptive methods			
Menopause			
Sexual intercourse in the last four weeks			
Pregnancies	Number of pregnancies	Categorical (none or one or more)/ independent	Factor
Vulvovaginal symptoms			
Vulvovaginal symptoms	VSQ-Br	Categorical (yes or no)/dependent	Outcome
Prevalence of vulvovaginal symptoms	VSQ-Br scale (symptoms)	Categorical (yes or no)	Not included in the regression analysis Analyzed using descriptive statistics

VSQ-Br, Vulvovaginal Symptoms Questionnaire Brazilian Portuguese version.

Table 2
Sample characteristics and associations between contextual factors and vulvovaginal symptoms.

Characteristics	Women with vulvovaginal symptoms 227 (72.5%)	χ^2	Women without vulvovaginal symptoms 86 (27.5%)	*P*	Total 313
Mean age (SD)	30.8 (± 10.5)	n/a	33.4 (± 10.0)	0.04	34.0 (± 11.5)
Occupation		0.48		0.49	
Not working	65 (29%)		22 (26%)		87 (28%)
Working	162 (71%)		64 (74%)		226 (72%)
Educational level		5.15		0.02	
Middle and high school	66 (29%)		15 (17%)		81 (26%)
Higher education	161 (71%)		71 (83%)		232 (74%)
Marital status		0.65		0.42	
Single	137 (60%)		47 (55%)		184 (59%)
Married/ stable union	90 (40%)		39 (45%)		129 (41%)
Physical activity	163 (72%)	0.67	58 (67%)	0.41	221 (71%)
Smoking	20 (9%)	0.03	7 (8%)	0.87	27 (9%)
Urinary incontinence	44 (19%)	1.77	11 (13%)	0.18	55 (18%)
Contraceptive methods	165 (73%)	0.33	60 (70%)	0.57	225 (72%)
Menopause	13 (6%)	1.34	8 (9%)	0.25	21 (7%)
Gynecological surgery	26 (11%)	1.39	14 (16%)	0.24	40 (13%)
Pregnancies		4.76		0.03	
None	158 (70%)		49 (57%)		207 (66%)
One or more	69 (30%)		37 (43%)		106 (34%)
Sexual intercourse in the last four weeks	179 (79%)	0.05	69 (80%)	0.82	248 (79%)

n/a, not applicable; SD, standard deviation;.

between contextual factors and vulvovaginal symptoms of 313 participants. There were no exclusions based on the criteria of this study. The prevalence of vulvovaginal symptoms in young women was 72.5% (227). The contextual factors of age ($p < 0.04$), education ($p < 0.02$), urinary incontinence ($p < 0.20$), and number of pregnancies ($p < 0.03$) were included in the multivariate analysis.

The logistic regression model ($R^2 = 0.032$) showed that women with middle or high school levels education and no pregnancy presented a greater association of vulvovaginal symptoms than women with higher educational levels and one or more pregnancies (Table 3).

Vaginal discharge (63.4%) and itching (54.6%) were the most prevalent symptoms (Table 4).

The mean score of VSQ-Br was 5.21 (± 4.5) points. The mean scores of the scales symptoms, emotions, life impact, and sexual impact were 2.6 (± 10.4), 4.0 (± 1.0), 0.6 (± 1.1), and 1.1 (± 1.4), respectively. The sexual impact was analyzed only in sexually active women (179 participants).

Table 4
Prevalence of vulvovaginal symptoms according to VSQ-Br.

VSQ-Br During the past week, have you been bothered by:	Women with vulvovaginal symptoms 227
Question one - "Your vulva itching?"	124 (54.6%)
Question two - "Your vulva burning or stinging?"	71 (31.3%)
Question three - "Your vulva hurting?"	46 (20.3%)
Question four- "Your vulva being irritated?"	63 (27.8%)
Question five - "Your vulva being dry?"	69 (30.4%)
Question six - "Discharge from your vulva or vagina?"	144 (63.4%)
Question seven - "Odor from your vulva or vagina?"	64 (28.2%)

VSQ-Br, Vulvovaginal Symptoms Questionnaire Brazilian Portuguese version.

Discussion

The results showed that the prevalence of symptoms among young women was 72.5% (227), low educational levels and no pregnancy were contextual factors associated with vulvovaginal symptoms. Sociodemographic, gynecologic, and obstetric data were similar in both groups. However, participants with vulvovaginal symptoms were older than those without symptoms. The majority of participants reported being physically active, non-smokers, and using contraceptive methods.

The prevalence of vulvovaginal symptoms was high (72.5%) in the participants of this study, and higher than in older populations (51.1%) where investigations of these symptoms are more frequent.[2] The instrument used to assess symptoms is an appropriate tool that should be used both in clinical practice and scientific research in Brazil.[1-3] However, this assessment may be neglected and forgotten by women due to their lack of knowledge about causes and consequences of vulvovaginal symptoms, as well as by healthcare professionals during patient care.[15,16] Given this, the high prevalence of vulvovaginal symptoms in the participants of this study highlights the importance of considering the presence and impacts of symptoms throughout the female life cycle.

Regarding the impact of symptoms assessed by the instrument's subscales, there was no information in the literature about a cutoff point to determine how low or high it would be. In the cross-cultural adaptation and validation study of the instrument, the means found in the emotional impact and quality of life subscale were 0.9 (±1.3) and 0.4 (±0.9), respectively, with no data relating to sexual impact.[3] Comparing our findings with the participants evaluated by the instrument adaptation study, we observed that in our study there was a greater reported impact of vulvovaginal symptoms on the participants' lives.

The association between low educational level and prevalent vulvovaginal symptoms may be due to impaired access to health services, low socioeconomic status, and neglect of symptoms. Studies in the United States of America[17] and Iran[18] analyzing sociodemographic factors in women pre-, peri-, and post-menopause identified that high educational level, employment, and monthly income influenced the search for health care. Despite the different participant profiles in these studies, we found similar results: vulvovaginal symptoms are less

Table 3
Logistic regression analysis.

Variable	β	SE	Z (Wald)	Sig.	Exp (β)	OR	95% CI	*P*
Educational level								
Middle and high school	0.726	0.329	4.857	0.028	2.067	2.06	1.08, 3.94	0.021
Pregnancies								
None	0.573	0.265	4.654	0.031	1.773	1.77	1.05, 2.98	0.032

β, coefficient (B); CI, confidence interval; Exp (**β**), confidence interval for Exp (**β**); OR, odds ratio; SE, standard error; Z (Wald), wald statistics.

prevalent in women with high education levels, probably due to more search for health care and prevention.

The number of pregnancies was also associated with the prevalence of vulvovaginal symptoms. Health monitoring is important at all stages of the female life cycle, but may be more frequent during pregnancy. In Brazil, health services still face barriers of geographic accessibility, professional availability, and understanding of health care needs.[18] These factors are unrelated to female biology, but result in neglect of gynecological health care. Thus, a possible relationship between the findings of this study and data from the literature is that there is a lower frequency than necessary throughout women's lives to health services, with gynecological care only occurring in the presence or worsening of symptoms.[19-22] Although the female vital cycle requires routine monitoring, this is uncommon in the general population, being more frequent during the gestational period. Therefore, monitoring during the gestational period can be a source of information about self-care and health care for these women.

Regarding age, participants who presented vulvovaginal symptoms were mainly younger, highlighting the importance of evaluating these symptoms in this population, regardless of their health status. Regardless of life stage, women experience physiological and social changes (e.g., work and family relationships) that affect self-care.[23]

According to the results of this study, it is relevant to consider the biological aspect (prevalence of symptoms), psychological factors (emotional impact, quality of life, and impact on sexual function), and social aspects (association of contextual factors with the presence of symptoms) in women's health. Based on this knowledge about these data, it becomes possible to have an impact on clinical practice by providing more assertive and meaningful health care to the population. This involves considering their health complaints and specificities, such as personal characteristics and impacts on their social participation, a possible relationship with pelvic floor dysfunctions, among others.

Women's Health physical therapists must perform the physical therapy diagnosis of movement changes related to vulvovaginal symptoms, and there are classification systems for physical therapy diagnoses including the genital system.[24] Future studies should investigate not only the impact of vulvovaginal symptoms on women's functionality, but also the specific physical therapy diagnosis in this area that can guide physical therapy treatments.

In this sense, we would like to highlight that, although our sample size corresponds to the one calculated, a larger sample with greater sociocultural and health variability would increase the validity of the study. Furthermore, we recognize that the cross-sectional study design does not allow for the establishing of causality between the variables, and it is important to consider other types of studies to complement our findings. It is also important to note that online data collection may have hindered the participation of elderly women and women in situations of socioeconomic vulnerability. Some variables used, such as physical activity and smoking status, were collected only based on the participants' reports; thus, it is important to perform studies with structured questionnaires. Finally, due to the scarcity of studies on the presence of vulvovaginal symptoms and their relationship with contextual factors, inferences about these aspects become limited.

Conclusion

This study showed a high prevalence of vulvovaginal symptoms in young Brazilian women, and the predominant symptoms were vaginal discharge and itching. Regarding contextual factors, low education and lack of pregnancy were associated with the presence of vulvovaginal symptoms, indicating that these factors can affect female health. Therefore, considering vulvovaginal symptoms in young women and associating them with individual women's characteristics based on contextual factors (such as socioeconomic status and educational level) is important for effective health care delivery.

Funding

This work was financed by the São Paulo Research Foundation (FAPESP, grant 318, no. 2019/14666-7).

Declaration of competing interest

The authors declare no competing interest.

Acknowledgments

We thank the participants of this study who allowed study development, the São Paulo Research Foundation (FAPESP) for the funding, the University Hospital of UFSCar managed by the Brazilian Company of Hospital Services (EBSERH) for authorizing data collection, and the Federal University of São Carlos (UFSCar) for the support

References

1. Erekson EA, Yip SO, Wedderburn TS, et al. The Vulvovaginal Symptoms Questionnaire: a questionnaire for measuring vulvovaginal symptoms in postmenopausal women. *Menopause*. 2013;20(9):973–979. https://doi.org/10.1097/GME.0b013e318282600b.
2. Erekson EA, Li FY, Martin DK, Fried TR. Vulvovaginal symptoms prevalence in postmenopausal women and relationship to other menopausal symptoms and pelvic floor disorders. *Menopause*. 2016;23(4):368–375. https://doi.org/10.1097/GME.0000000000000549.
3. Alem MER, Chaves TC, de Figueiredo VB, et al. Cross-cultural adaptation and psychometric evaluation of the Brazilian Portuguese version of the Vulvovaginal Symptoms Questionnaire. *Menopause*. 2022;29(9):1055–1061. https://doi.org/10.1097/GME.0000000000002030.
4. World Health Organization. *ICF: International Classification of Functioning, Disability and Health*. 1th. 2001. Geneva.
5. Conselho Federal de Fisioterapia e Terapia Ocupacional (BRASIL). Resolução N° 370, de 6 de Novembro de 2009 sobre a adoção da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) da Organização Mundial de Saúde por Fisioterapeutas e Terapeutas Ocupacionais. Acessado novembro de 2022. https://www.coffito.gov.br/nsite/?p=3133.
6. DESB. Navegador de consulta à CIF. Acessado em novembro de 2022. https://www.desb.com.br/.
7. Islam RM, Bell RJ, Hossain MB, Davis SR. Types of urinary incontinence in Bangladeshi women at midlife: prevalence and risk factors. *Maturitas*. 2018;116:18–23. https://doi.org/10.1016/j.maturitas.2018.07.012.
8. Haas JS, Jackson RA, Fuentes-Afflick E, et al. Changes in the health status of women during and after pregnancy. *J Gen Intern Med*. 2005;20(1):45–51. https://doi.org/10.1111/j.1525-1497.2004.40097.x.
9. Silva Lda, Lopes MHBde M. Incontinência urinária em mulheres: razões da não procura por tratamento. *Rev esc enferm USP*. 2009;43(1):72–78. https://doi.org/10.1590/S0080-62342009000100009.
10. Costa PMR. *Incontinência Urinária Em mulheres: Avaliação Do Impacto Na Qualidade De Vida e Razões Da Não Procura Por Tratamento [dissertação]*. Diamantina, Brazil: Universidade Federal dos Vales do Jequitinhonha e Mucuri; 2020. https://repositorio.ufvjm.edu.br/items/f82b8d66-e275-4903-a18a-5c656dc316f7.
11. Parden AM, Griffin RL, Hoover K, et al. Prevalence, awareness, and understanding of Pelvic floor disorders in adolescent and young women. *Female Pelvic Med Reconstr Surg*. 2016;22(5):346–354. https://doi.org/10.1097/SPV.0000000000000287.
12. Malta M, Cardoso LO, Bastos FI, Magnanini MM, Silva CM. STROBE initiative: guidelines on reporting observational studies. *Rev Saude Publica*. 2010;44(3):559–565. https://doi.org/10.1590/s0034-89102010000300021.
13. Andy Field. *Discovering Statistics with SPSS*. 2th ed. 2005.
14. Hosmer DW, Lemeshow S. Model-building strategies and methods for logistic regression. In: Hosmer DW, Lemeshow S, eds. *Applied Logistic Regression*. New York: Wiley; 2000:91–142.
15. Farage MA, Miller KW, Ledger WJ. Determining the cause of vulvovaginal symptoms. *Obstet Gynecol Surv*. 2008;63(7):445–464. https://doi.org/10.1097/OGX.0b013e318172ee25.
16. Al-Azzawi F. Measuring vulvovaginal symptoms in postmenopausal women. *Climacteric*. 2013;16(5):605–606.
17. Gold EB, Crawford SL, Avis NE, et al. Factors related to age at natural menopause: longitudinal analyses from SWAN. *Am J Epidemiol*. 2013;178(1):70–83. https://doi.org/10.1093/aje/kws421.
18. Simbar M, Nazarpour S, KhodaKarami N, et al. A situation analysis on postmenopausal women's self-care needs and priorities in Tehran: a population-based study. *BMC Public Health*. 2023;23(1):104. https://doi.org/10.1186/s12889-023-15040-z. Published 2023 Jan 14.
19. Oliveira RAD de, Duarte CMR, Pavão ALB, Viacava F. Barreiras de acesso aos serviços em cinco Regiões de Saúde do Brasil: percepção de gestores e profissionais do Sistema Único de Saúde. *Cad Saúde Pública*. 2019;35(11), e00120718. https://doi.org/10.1590/0102-311X00120718.

20. Carvacho IE, Mello MBde, Morais SS, Silva JLPe. Fatores associados ao acesso anterior à gestação a serviços de saúde por adolescentes gestantes. *Rev Saúde Pública*. 2008;42(5):886–894. https://doi.org/10.1590/S0034-89102008000500014.
21. Gomes VLde O, Fonseca ADda, Oliveira DCde, Silva CD, Acosta DF, Pereira FW. The representations of adolescents about gynecological consultation. *Rev esc enferm USP*. 2014;48(3):438–445. https://doi.org/10.1590/S0080-623420140000300008.
22. Prairie BA, Klein-Patel M, Lee M, Wisner KL, Balk JL. What midlife women want from gynecologists: a survey of patients in specialty and private practices. *J Womens Health (Larchmt)*. 2014;23(6):513–518. https://doi.org/10.1089/jwh.2013.4263.
23. Cerrato J, Cifre E. Gender inequality in household chores and work-Family conflict. *Front Psychol*. 2018;9:1330. https://doi.org/10.3389/fpsyg.2018.01330. Published 2018 Aug 3.
24. Martinez BP, Cepeda RM, Ferreira FMM, et al. Brazilian classification of physical therapy diagnosis. *Braz J Phys Ther*. 2024;28(3), 101066. https://doi.org/10.1016/j.bjpt.2024.101066.