



# Genitourinary syndrome in menopause: Impact of vaginal symptoms

## Menopozda genitoüriner sendrom: Vajinal semptomların etkisi

✉ Juan Pedro Matzumura Kasano<sup>1</sup>, ✉ Hugo F. Gutiérrez Crespo<sup>1</sup>, ✉ Raúl Alberto Ruiz Arias<sup>2</sup>, ✉ Isabel Alamo<sup>3</sup>

<sup>1</sup>Department of Obstetrician and Gynecologist, Faculty of Medicine of the Universidad Nacional Mayor de San Marcos, Lima, Peru

<sup>2</sup>Universidad Nacional Federico Villarreal, Lima, Peru

<sup>3</sup>Department of Health Services Management, Faculty of Medicine of the Universidad Ricardo Palma, Santiago de Surco, Peru

### Abstract

**Objective:** To describe the impact of genitourinary syndrome symptoms on daily activities and well-being in peri- and postmenopausal women living in an urban area.

**Materials and Methods:** Observational, prospective, and cross-sectional research in a population of peri- and postmenopausal women living in the Lima region. A non-probabilistic sample was used. The instrument used is "The Day-to-Day Impact of Vaginal Aging" questionnaire. It consists of four domains and its internal reliability is between 0.82 and 0.93. The questions were answered using a Likert scale. High values indicate a more severe impact. Statistical procedures were performed using SPSS version 26.

**Results:** One thousand seventy women participated; the mean age was 54±7.5 years. The results about the activities of daily living showed that 35% of women reported regular vaginal symptoms and 14.7% major symptoms. In the emotional well-being domain, 90% had minor symptoms. In the sexual function domain, 57.6% reported minor vaginal symptoms, and in the self-concept and body image domain, 60.9% reported minor symptoms and 20.7% major symptoms. According to the global score, 60.9% reported minor discomfort, 36.3% regular discomfort, and 2.8% major discomfort. The sexually active women declared an impact of severity in terms of their daily activities and sexual function ( $p<0.05$ ).

**Conclusion:** There is a relationship between activities of daily living, sexual function, and women with sexual activity, causing a negative impact on social life and quality of life.

**Keywords:** Menopause, symptoms, vulvovaginal atrophy, postmenopause

### Öz

**Amaç:** Kentsel bir bölgede yaşayan peri ve postmenopozal kadınlarda genitoüriner sendrom semptomlarının günlük aktiviteler ve iyilik hali üzerindeki etkisini tanımlamak amaçlanmıştır.

**Gereç ve Yöntemler:** Lima bölgesinde yaşayan peri ve postmenopozal kadın popülasyonunda gözlemsel, prospektif ve kesitsel bir araştırma yapılmıştır. Olasılığa dayalı olmayan bir örneklem kullanılmıştır. Kullanılan ölçek "Vajinal Yaşlanmanın Günden Güne Etkisi" anketidir. Dört alandan oluşmaktadır ve internal güvenilirliği 0,82 ile 0,93 arasındadır. Sorular Likert ölçeği kullanılarak cevaplanmıştır. Yüksek değerler daha ciddi bir etkiyi göstermektedir. İstatistiksel analiz SPSS 26 versiyonu kullanılarak yapılmıştır.

**Bulgular:** Bin yetmiş kadın katılmıştır ve yaş ortalaması 54±7,5 olarak hesaplanmıştır. Günlük yaşam aktiviteleri ile ilgili sonuçlar, kadınların %35'inin düzenli vajinal semptomlar ve %14,7'sinin majör semptomlar bildirdiğini göstermiştir. Duygusal esenlik alanında, katılımcıların %90'ın minör semptomlar bildirmiştir. Cinsel işlev alanında katılımcıların %57,6'sı minör vajinal semptomlar ve benlik kavramı ve beden imajı alanında %60,9'u minör semptomlar ve %20,7'si majör semptomlar bildirmiştir. Global skora göre, %60,9'u minör rahatsızlık, %36,3'ü düzenli rahatsızlık ve %2,8'i majör rahatsızlık bildirmiştir. Cinsel olarak aktif kadınlar, günlük aktiviteleri ve cinsel işlevleri açısından semptomların şiddetinin bir etkisi olduğunu bildirmişlerdir ( $p<0,05$ ).

**Sonuç:** Günlük yaşam aktiviteleri, cinsel işlev ve kadın ile cinsel aktivite arasında ilişki vardır, bu da sosyal yaşamı ve yaşam kalitesini olumsuz etkiler.

**Anahtar Kelimeler:** Menopoz, semptomlar, vulvovajinal atrofi, postmenopoz

**PRECIS:** Genitourinary syndrome in menopause: Impact.

**Address for Correspondence/Yazışma Adresi:** Juan Pedro Matzumura Kasano MD,  
Department of Obstetrician and Gynecologist, Faculty of Medicine of the Universidad Nacional Mayor de San Marcos, Lima, Peru  
**Phone:** +51 999008897 **E-mail:** jmatzumura@yahoo.com **ORCID ID:** orcid.org/0000-0002-1464-550X  
**Received/Geliş Tarihi:** 10.11.2022 **Accepted/Kabul Tarihi:** 13.01.2023

©Copyright 2023 by Turkish Society of Obstetrics and Gynecology  
Turkish Journal of Obstetrics and Gynecology published by Galenos Publishing House.

## Introduction

The Genitourinary syndrome of menopause is characterized by symptoms and signs resulting from the effect of estrogen deficiency on the female genitourinary tract. Symptoms associated with genitourinary syndrome are highly prevalent and affect approximately up to 84% of postmenopausal women worldwide<sup>(1-3)</sup>. Women often report genital and/or vulvovaginal symptoms, such as: Vaginal dryness or burning, urinary urgency symptoms, dysuria, and sexual symptoms such as: Pain during intercourse or loss of sexual desire<sup>(4,5)</sup>. The variety of symptoms often appear from the late menopausal transition onwards and persist for several years. These symptoms have been associated with poor sexual functioning, reduced quality of life, and poor emotional well-being<sup>(6-8)</sup>. Note that the genitourinary syndrome was previously known as vulvovaginal atrophy to which the urinary component was added to have a better clinical approach<sup>(9)</sup>. Research conducted in the United States reported that only 3% of women of reproductive age reported vaginal dryness, whereas 21% of women in late menopausal transition and 47% of women three years after menopause reported this symptom<sup>(10,11)</sup>. Another research conducted involving 4,000 postmenopausal women reported a prevalence of 39% for vaginal discomfort<sup>(12)</sup>. The Vaginal Health: Insights, Views & Attitudes survey conducted with the participation of 3,520 postmenopausal women from six countries reported that 45% of women have experienced vaginal symptoms and 75% stated that their symptoms had a negative impact on life<sup>(13)</sup>. Similar research conducted with 500 American women reported that 48% of women reported vaginal discomfort, and the most frequent symptoms were vaginal dryness and pain during intercourse<sup>(14)</sup>. Likewise, the same research reported several adverse events related to vaginal discomfort: Negative impact on their lives (80%), adverse effect on sexual intimacy (75%), feeling less sexual (68%), negative consequences on marriage (33%), and a negative effect on self-esteem (26%)<sup>(15)</sup>.

If untreated, genitourinary syndrome will be progressive and will negatively affect sexual function and quality of life<sup>(16,17)</sup>. Recent research has shown that women not only recognize genitourinary syndrome as a chronic condition, but are reluctant to discuss their vaginal or sexual discomfort with their physician because of embarrassment or concern about the side effects of treatment<sup>(18)</sup>. Barriers to the identification and treatment of genitourinary syndrome include limited time during patient visits, lack of physician training regarding the diagnosis and treatment of this condition, and the misconception that genitourinary syndrome only affects sexually active women<sup>(19)</sup>. Currently, there are a growing number of hormonal and non-hormonal treatments to alleviate the various symptoms of genitourinary syndrome, although low-dose vaginal estrogens remain a safe and highly effective hormonal treatment option. However, many women and physicians have concerns about estrogen therapy, particularly in the context of a personal or high-risk history of breast cancer<sup>(20,21)</sup>. A systematic review

demonstrated that no single treatment was completely effective in relieving genitourinary syndrome-related dyspareunia in women with female sexual dysfunction. Therefore, the implementation of a multidisciplinary approach to the management of genitourinary syndrome on an individual and personalized basis is recommended<sup>(22,23)</sup>.

The growing literature on genitourinary syndrome is not without limitations. First, few questionnaires are validated to assess the various symptoms, so investigators develop their own questionnaires, making comparison between studies difficult. Second, research often measures the presence of genitourinary syndrome but not symptom interference. Third, most of the literature focuses on sexuality, and vaginal symptoms are highlighted more often than vulvovaginal symptoms and with less priority given to a comprehensive evaluation. Additionally, important information on symptoms unrelated to sexual function or symptoms experienced by women who are not sexually active is omitted<sup>(24)</sup>. Therefore, the aim of this study aimed to describe the impact of genitourinary syndrome symptoms on daily functioning and well-being in peri- and postmenopausal women living in an urban area.

## Materials and Methods

The research is observational, prospective, and cross-sectional in a cohort of peri- and postmenopausal women living in the Lima region. It included the participation of older women aged  $\geq 45$  years, who attended the gynecological consultation for any reason in health facilities of the first level of care in the Lima region in 2021. A non-probabilistic convenience sample was used. The inclusion criteria were: women aged  $\geq 45$  years, absence of menstrual period for at least one year and without difficulty to read or write, and having given their consent to participate in the research.

The instrument used is a self-report questionnaire called The Day-to-Day Impact of Vaginal Aging (DIVA)<sup>(25)</sup>. The participants completed the questionnaire, which has previously demonstrated good face validity, construct validity, and internal reliability, with values for the four domains between 0.82 and 0.93. It includes four specific domains to assess the impact of symptoms: activities of daily living (5 questions), emotional well-being (4 questions), sexual function (7 questions), and self-concept and body image (5 questions). All questions have response scales using a Likert scale with values between 0 to 4; higher values indicate a more severe impact. The scores for each domain are calculated by averaging the scores of the individual questions in each domain.

The research procedures were performed in accordance with the Declaration of Helsinki and were approved by the Ethics Committee of the Peruvian Menopause Society, under letter 003-2021/SPC dated January 15<sup>th</sup> 2021.

## Statistical Analysis

The statistical analysis for qualitative variables was expressed as absolute and relative frequencies, while quantitative variables

were expressed as mean and standard deviation. Mean scores were established for each domain in women with and without genitourinary syndrome. Bivariate analysis was performed using the chi-square test of independence. All statistical procedures were performed using SPSS version 26.

## Results

A total of 1,100 women were invited to participate, of which 30 were excluded because they did not meet the inclusion criteria. A total of 1,070 women were included in the analysis, who agreed to participate after providing explanations and answering questions. Regarding the sociodemographic characteristics of the women, the average age was 54 years standard deviation (SD) $\pm$ 7.5. 68.2% were married and/or cohabiting, 12.9% were single, 11.4% were divorced and 7.5% were widowed. Eighty-two percent reported being sexually active, and 18% reported not being sexually active.

With respect to the results corresponding to the activities of daily living: 32.2% stated that vaginal symptoms interfered very little when walking and 28.6% reported that vaginal symptoms interfered very little when wearing clothes or underwear. 28.9% stated that there was no interference when using the toilet, 27.4% felt very little interference when sitting for more than one hour, and 30.7% reported that vaginal symptoms interfered very little with getting a good night's sleep. Likewise, in the emotional well-being domain, 63.5% stated that the presence of vaginal symptoms had very little influence on feeling depressed, 54.2% very little influence on feeling embarrassed, 55.5% very little influence on feeling frustrated or resentful, and 57.1% very little influence on feeling sad.

The results corresponding to the sexual function domain showed that: 34.9% stated that vaginal symptoms have very little impact of severity on the desire and interest in having sexual intercourse, 40.5% very little impact with respect to the frequency of sexual intercourse or other sexual activity, 29.8% very little impact, and 24.6% moderate impact with respect to the ability to become aroused during sexual activity. Likewise, the presence of vaginal symptoms and their severity impact on the experience of feeling pleasure during sexual activity was very little in 30.9% of women and the impact was moderate in 26.1%; 37% expressed very little impact regarding the desire or interest in being in a sexual relationship. However, 28.9% of women reported that vaginal symptoms have very little impact of severity on their confidence in sexual satisfaction, and 14% reported that there is usually a severe impact. Regarding the indicator of the presence of vaginal symptoms and overall satisfaction with sex life, 30.7% reported very little impact and 29% reported a moderate impact.

As for the last domain analyzed, corresponding to self-concept and body image, 33.5% of women stated that vaginal symptoms affected very little their feelings about feeling that they were growing old, while 17.6% stated that this was the case in an extreme form. 37.5% reported that they never felt unwanted

because of their vaginal symptoms. Likewise, 33.3% reported that they had lost something in their bodies when they thought about vaginal symptoms, and 33% reported that vaginal symptoms made them feel that their body was deteriorating. 39.5% of the women stated that they never felt less sexually attractive due to the presence of vaginal symptoms, while 17.8% stated that they felt extremely less sexually attractive.

According to the assessments by domains, activities of daily living had an average value of 1.5 SD  $\pm$ 0.9, while in the dimension of self-esteem and body image, the average value corresponded to 1.4 SD  $\pm$ 1.2 (Table 1).

The analysis of the results corresponding to the score in the activities of daily living found that 35% of the women showed regular vaginal symptoms and 14.7% showed major symptoms. In the emotional well-being domain, 90% showed minor symptoms. In the sexual function domain, 57.6% showed minor vaginal symptoms, and in the self-concept and body image domains, 60.9% showed minor symptoms, and 20.7% showed major symptoms. According to the analysis of the global score, 60.9% showed minor discomfort, 36.3% showed regular discomfort, and 2.8% showed major discomfort (Figure 1).

Sexually active women had higher mean scores than non-sexually active women in the four domains studied (Figure 2).

The comparison of results in women according to sexual activity identified differences between women with minor discomfort in the domain linked to activities of daily living: 58% in women who are not sexually active and 48.2% for women who are sexually active. However, in the sexual function domain, 82.4% of women without sexual activity reported minor discomfort, whereas 52.1% of sexually active women reported minor discomfort (Table 2). According to the global score, 72.5% of women without sexual activity reported minor vaginal symptoms, while that figure was of 58.4% for sexually active women. The bivariate analysis identified a relationship between the following domains: activities of daily living, sexual function, and sexually active women ( $p < 0.05$ ).

## Discussion

The research was conducted in compliance with the inclusion criteria, obtaining consent, explaining the research objectives to the women, and the correct completion of the questionnaire,

**Table 1.** Impact of vaginal symptoms on functioning and well-being by domains

Domain	Average value	Standard deviation
Activities of daily living	1.5	0.9
Emotional well-being	0.9	0.6
Sexual function	1.3	0.8
Self-concept and body image	1.4	1.2
Source: Own elaboration		

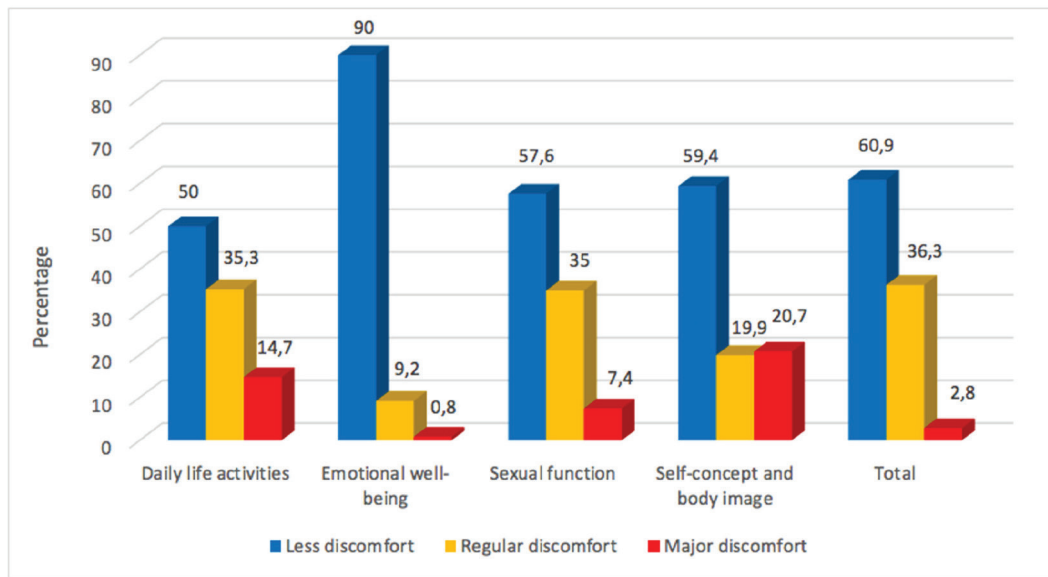


Figure 1. Global score of vaginal symptoms and their impact according to domains

Source: Own elaboration

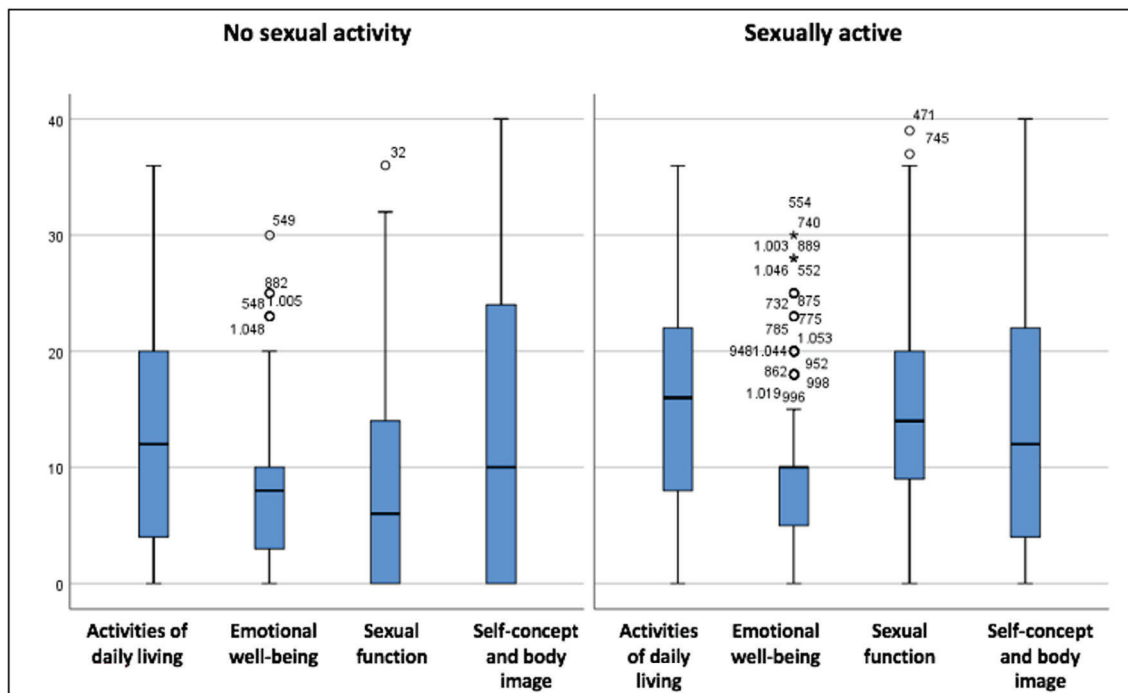


Figure 2. Results of vaginal symptoms by domains

which facilitated the analysis of the results according to the proposed methodology.

Middle age brings a series of personal and social changes to women. Generally, cultural and social beliefs influence the perception and interpretation of menopausal symptoms, as well as how much it affects daily activities<sup>(26)</sup>. Although 20% of women around the world consider menopause a disease, they are not completely sure of the effects it produces on their health<sup>(27)</sup>. Depending on the characteristics of each person and

their occupation, the slightest symptoms can cause anxiety in some women, having difficulties in coping with their daily activities.

DIVA questionnaire was used to identify genitourinary syndrome in peri- and postmenopausal women<sup>(25)</sup>; however, the questionnaire does not consider the urinary component. Note that the urinary symptoms produced by the genitourinary syndrome continue to be less studied due to the direct influence of estrogen deficiency and require further study and analysis of

**Table 2.** Analysis of vaginal symptoms and sexual activity

Domain	Discomfort	No sexual activity	n%	Sexually active	n%	Total	n%	p-value
<b>Activities of daily living</b>								
	Minor discomfort	112	58	423	48.2	535	50	0.041
	Regular discomfort	55	28.5	323	36.8	378	35.3	
	Major discomfort	26	13.5	131	14.9	157	14.7	
<b>Emotional well-being</b>								
	Minor discomfort	174	90.2	789	90	963	90	0.861
	Regular discomfort	18	9.3	80	9.1	98	9.2	
	Major discomfort	1	0.5	8	0.9	9	0.8	
<b>Sexual function</b>								
	Minor discomfort	159	82.4	457	52.1	616	57.6	0.000
	Regular discomfort	23	11.9	352	40.1	375	35	
	Major discomfort	11	5.7	68	7.8	79	7.4	
<b>Self-concept and body image</b>								
	Minor discomfort	114	59.1	522	59.5	636	59.4	0.151
	Regular discomfort	31	16.1	182	20.8	213	19.9	
	Major discomfort	48	24.9	173	19.7	221	20.7	
<b>Total</b>								
	Minor discomfort	140	72.5	512	58.4	652	60.9	0.000
	Regular discomfort	46	23.8	342	39	388	36.3	
	Major discomfort	7	3.6	23	2.6	30	2.8	

Source: Own elaboration

this component<sup>(28-30)</sup>. Despite the reliability and validity of some questionnaires that evaluate urogenital and sexual symptoms in middle-aged women, self-report measures are not specifically focused on vulvovaginal symptoms in post menopause. According to the literature review, our results are the first to be conducted in a population from the region of Lima, Peru.

The results corresponding to the activities of the daily living domain showed higher values than other domains. The causes for this interpersonal variation in the conception of menopause may be linked to how intense the symptoms are. Although it could also depend on the interpretation and management of the symptoms, depending on their social and cultural situation<sup>(31)</sup>. However, an investigation carried out with postmenopausal women in Spain found that vaginal symptoms had less relevance in daily activities and linked them more with general aspects than with the genitourinary syndrome. The physical appearance or the work activity when having hot flashes are examples of this. In addition, women could have erroneously associated the state of emotional well-being with respect to their body perception and self-perception, since many postmenopausal women believe that vaginal symptoms are associated with age<sup>(32,33)</sup>.

Several investigations indicate that one in four women with genitourinary syndrome of menopause reported emotional repercussions, the most frequent being: Concern about vaginal symptoms and the appearance of the vulva<sup>(34)</sup>. Contrarily, the results in this domain turned out to be lower and apparently do not have an impact on feeling depressed, embarrassed, or feeling sad. The differences with similar research may be due to the data being underestimated, as vaginal and/or genitourinary symptoms have become an uncomfortable topic of conversation for women with their partner, family members, and physician<sup>(7,8)</sup>. Note that the specialized literature emphasizes that vulvovaginal symptoms are associated with unfavorable emotional well-being scores (depression and anxiety) and these contribute to the presence of early vulvovaginal atrophy symptomatology<sup>(35,36)</sup>.

Sexual function disorders are relatively common in postmenopausal women, but often go undiagnosed. They are defined "as the absence of sexual fantasies and thoughts and/or desire or receptivity to sexual activity that causes personal distress or relationship difficulties"<sup>(37)</sup>. Several studies indicated that 50% of postmenopausal women suffer from sexual symptoms, which include dryness, dyspareunia, or sexual

function, and these are related to sexual desire disorder, and the severity of these symptoms increases the rate of sexual dysfunction. Note that sexual function can be aggravated by emotional state or by chronic diseases, including metabolic syndrome<sup>(38-40)</sup>. Our findings allowed us to identify that vaginal symptoms had an unfavorable impact on arousal capacity, ability to feel pleasure, sexual satisfaction, and moderately affected sexual life. These findings appear to be supported by those described in the “Study of Women’s Health Across the Nation,” which found a significant decline in sexual desire as women moved through menopause. Likewise, the “Real Women’s Views of Treatment options for Menopausal Vaginal Changes” study notes that sexual function is influenced by the confirmation of the diagnosis of vulvovaginal atrophy, mainly in the components linked to sexual arousal, lubrication, orgasm, and dyspareunia<sup>(41)</sup>.

Concerning decreased sexual desire, research conducted in Australian women found a prevalence of 69.3%, and other research has reported a prevalence of 71% for decreased sexual desire<sup>(42-44)</sup>. The findings of the reviewed investigations are much higher than those of our study, so it is necessary that medical specialists pay more attention to the management of sexual function, considering aspects that favor a healthy sexual life in women with menopause, such as psychosocial, for example.

The self-concept and body perception domains showed an unfavorable impact due to the existence of vaginal symptoms. This could be influenced by the relationship between the presence of genitourinary syndrome and the quality of life of postmenopausal women, producing a negative impact on social life and quality of life in general<sup>(22,33,45)</sup>.

This result is relevant because women with various vaginal symptoms must receive treatment, both to resolve their vaginal discomfort and to improve their self-esteem, sexual and emotional well-being, and other aspects related to their quality of life, which is the most important thing. Our findings coincide with those described by the “European Vulvovaginal Epidemiology Survey,” which indicates that the self-concept and body perception dimensions had a negative impact since women feel less attractive and vaginal symptoms are considered part of aging and deterioration of health<sup>(46)</sup>.

Likewise, some research indicated that women in southern European countries are more concerned about the long-term impact of vaginal discomfort, which negatively contributes to women’s family and sexual lives<sup>(47)</sup>.

The findings of our study showed that sexually active women have an unfavorable impact in all dimensions, and with greater relevance in the domains of daily activities and sexual function. This is reaffirmed by reports from the “Study of Women’s Health Across the Nation” indicating that African American women place more importance on sex more frequently than white women; the importance of sexuality is explained in the frequency of sexual intercourse, sexual desire, arousal, and sexual functioning<sup>(48)</sup>. Likewise, North American women of

Chinese and Japanese ancestry are reported to be less sexually active compared with Western women<sup>(48)</sup>. However, data from the “Pan-Asian REVIVE” study reveal in Asian women there is underdiagnosis and, therefore, undertreatment with genitourinary syndrome. When vaginal dryness and irritation occur, they negatively influence sexual enjoyment and intimacy for these women<sup>(49)</sup>.

In our research, vaginal discomfort considered regular and major was lower than that described by the “Vaginal Health: Insights, Views, and Attitudes” study, where it was observed that 62% of women described moderate and severe vaginal discomfort<sup>(13)</sup>. Likewise, the European Vulvovaginal Epidemiology Survey noted that more than 65% of sexually active Italian women had vulvovaginal atrophy<sup>(46)</sup>. These differences are due to the type of population of participating women, cultural characteristics, and sexual behavior specific to European women. According to our results, it is confirmed that sexually active women are affected by vaginal symptoms and vulvovaginal atrophy, due to the relationship between the presence of vaginal symptoms, activities of daily living, and sexual activities.

### Study Limitations

This research is not without limitations. Among the main limitations was the use of “The Day-to-Day Impact of Vaginal Aging” questionnaire, since this is little known and has not been used in Peru, which makes it difficult to compare results with research carried out in Peru and Latin America. Another limitation was the cross-sectional design, the lack of a control group, and possible selection bias because many women who present with vaginal symptoms do not visit a specialist for proper diagnosis and treatment. Although many women completed the questionnaire, the physicians did not have sufficient time to review and discuss the results with their patients at subsequent visits.

### Conclusion

The domains analyzed in this investigation allowed identifying a relationship between activities of daily living, sexual function, and women who are sexually active ( $p < 0.05$ ). This produces a negative impact on social life and the quality of life in general.

### Ethics

**Ethics Committee Approval:** The research procedures were performed in accordance with the Declaration of Helsinki and were approved by the Ethics Committee of the Peruvian Menopause Society, under letter 003-2021/SPC dated January 15<sup>th</sup> 2021.

**Informed Consent:** All participants gave their informed consent before the study was conducted.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: J.P.M.K., H.F.G.C., Design: J.P.M.K., H.F.G.C., R.A.R.A., Data Collection or Processing: J.P.M.K., H.F.G.C.,

R.A.R.A., I.A., Literature Search: I.A., Analysis or Interpretation: J.P.M.K., H.F.G.C., Writing: J.P.M.K., H.F.G.C.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

## References

1. The North American Menopause Society. The 2020 genitourinary syndrome of menopause position statement of The North American Menopause Society. *Menopause* 2020;27:976-92.
2. Pertyńska-Marczewska M, Pertyński T. Postmenopausal women in gynecological care. *Prz Menopauzalny* 2021;20:88-98.
3. Palma F, Volpe A, Villa P, Cagnacci A; Writing group of AGATA study. Vaginal atrophy of women in postmenopause. Results from a multicentric observational study: The AGATA study. *Maturitas* 2016;83:40-4.
4. Gandhi J, Chen A, Dagur G, Suh Y, Smith N, Cali B, et al. Genitourinary syndrome of menopause: an overview of clinical manifestations, pathophysiology, etiology, evaluation, and management. *Am J Obstet Gynecol* 2016;215:704-11.
5. Farrell Am E. Genitourinary syndrome of menopause. *Aust Fam Physician* 2017;46:481-4.
6. Mitchell CM, Ma N, Mitchell AJ, Wu MC, Valint DJ, Proll S, et al. Association between postmenopausal vulvovaginal discomfort, vaginal microbiota, and mucosal inflammation. *Am J Obstet Gynecol* 2021;225:159.e1-159.e15.
7. Hunter MM, Nakagawa S, Van Den Eeden SK, Kuppermann M, Huang AJ. Predictors of impact of vaginal symptoms in postmenopausal women. *Menopause* 2016;23:40-6.
8. Nappi RE, Palacios S, Bruyniks N, Particco M, Panay N, investigators ES. The burden of vulvovaginal atrophy on women's daily living: implications on quality of life from a face-to-face real-life survey. *Menopause* 2019;26:485-91.
9. Shifren JL, Zincavage R, Cho EL, Magnavita A, Portman DJ, Krychman ML, et al. Women's experience of vulvovaginal symptoms associated with menopause. *Menopause* 2016;26:341-9.
10. Dennerstein L, Dudley EC, Hopper JL, Guthrie JR, Burger HG. A prospective population-based study of menopausal symptoms. *Obstet Gynecol* 2000;96:351-8.
11. Woods NF, Mitchell ES. Symptoms during the perimenopause: prevalence, severity, trajectory, and significance in women's lives. *Am J Med* 2005;118(Suppl 12B):14-24.
12. Nappi RE, Kokot-Kierepa M. Women's voices in the menopause: results from an international survey on vaginal atrophy. *Maturitas* 2010;67:233-8.
13. Nappi RE, Kokot-Kierepa M. Vaginal Health: Insights, Views & Attitudes (VIVA) - results from an international survey. *Climacteric* 2012;15:36-44.
14. Nappi RE, Davis SR. The use of hormone therapy for the maintenance of urogynecological and sexual health post WHI. *Climacteric* 2012;15:267-74.
15. Simon JA, Kokot-Kierepa M, Goldstein J, Nappi RE. Vaginal health in the United States: results from the Vaginal Health: Insights, Views & Attitudes survey. *Menopause* 2013;20:1043-8.
16. Hoffstetter S. Managing postmenopausal dyspareunia: An update. *Women's Healthcare* 2018;6:6-12.
17. Management of symptomatic vulvovaginal atrophy: 2013 position statement of The North American Menopause Society. *Menopause* 2013;20:888-902; quiz 903-4.
18. Krychman M, Graham S, Bernick B, Mirkin S, Kingsberg SA. The Women's EMPOWER Survey: Women's Knowledge and Awareness of Treatment Options for Vulvar and Vaginal Atrophy Remains Inadequate. *J Sex Med* 2017;14:425-33.
19. Kim HK, Kang SY, Chung YJ, Kim JH, Kim MR. The Recent Review of the Genitourinary Syndrome of Menopause. *J Menopausal Med* 2015;21:65-71.
20. Faubion SS, Larkin LC, Stuenkel CA, Bachmann GA, Chism LA, Kagan R, et al. Management of genitourinary syndrome of menopause in women with or at high risk for breast cancer: consensus recommendations from The North American Menopause Society and The International Society for the Study of Women's Sexual Health. *Menopause* 2018;25:596-608.
21. Bolte S, Damast S, Diefenbach MA, DuHamel K, Florendo J, Ganz PA, et al. Interventions to Address Sexual Problems in People With Cancer: American Society of Clinical Oncology Clinical Practice Guideline Adaptation of Cancer Care Ontario Guideline. *J Clin Oncol* 2018;36:492-511.
22. The NAMS 2017 Hormone Therapy Position Statement Advisory Panel. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause* 2017;24:728-53.
23. Weinberger JM, Houman J, Caron AT, Anger J. Female Sexual Dysfunction: A Systematic Review of Outcomes Across Various Treatment Modalities. *Sex Med Rev* 2019;7:223-50.
24. Toivonen K, Santos-Iglesias P, Walker LM. Impact of Vulvovaginal Symptoms in Women Diagnosed with Cancer: A Psychometric Evaluation of the Day-to-Day Impact of Vaginal Aging Questionnaire. *J Womens Health (Larchmt)* 2021;30:1192-203.
25. Huang AJ, Gregorich SE, Kuppermann M, Nakagawa S, Van Den Eeden SK, Brown JS, et al. Day-to-Day Impact of Vaginal Aging questionnaire: a multidimensional measure of the impact of vaginal symptoms on functioning and well-being in postmenopausal women. *Menopause* 2015;22:144-54.
26. Alenezi MAH, Almutrafi OOO, Alruwaili HTM, Alanazi FSZ, Hammad SM. Menopause knowledge, attitude and severity of symptoms among women in Arar city, Saudi Arabia *Int Res J Public Environ Health* 2021;8:215-23.
27. Monteleone P, Mascagni G, Giannini A, Genazzani AR, Simoncini T. Symptoms of menopause - global prevalence, physiology and implications. *Nat Rev Endocrinol* 2018;14:199-215.
28. Fernandez-Alonso AM, Alcaide-Torres J, Fernandez-Alonso IM, Chedraui P, Perez-Lopez FR. Application of the 21-item Vulvovaginal Symptoms Questionnaire in postmenopausal Spanish women. *Menopause* 2017;24:1295-301.
29. Gabes M, Knüttel H, Stute P, Apfelbacher CJ. Measurement properties of patient-reported outcome measures (PROMs) for women with genitourinary syndrome of menopause: a systematic review. *Menopause* 2019;26:1342-53.
30. Gabes M, Shute P, Apfelbacher C. Validation of the German Day-to - Day impact of vaginal aging (DIVA) Questionnaire in Peri and Postmenopausal Women. *Sex Med* 2021;9:100382.

31. Sarti S, Zella S. Changes in the labour market and health inequalities during the years of the recent economic downturn in Italy. *Soc Sci Res* 2016;57:116-32.
32. Pinkerton JV, Bushmakin AG, Komm BS, Abraham L. Relationship between changes in vulvar-vaginal atrophy and changes in sexual functioning. *Maturitas* 2017;100:57-63.
33. Moral E, Delgado JL, Carmona F, Caballero B, Guillán C, González PM, et al. The impact of genitourinary syndrome of menopause on well-being, functioning, and quality of life in postmenopausal women. *Menopause* 2018;25:1418-23.
34. Monterrosa-Castro A, Redondo-Mendoza V, Monterrosa-Blanco A. Evaluation of the genitourinary syndrome of menopause with the Vulvovaginal Symptoms Questionnaire in Afrodescendants from the Colombian Caribbean. *Ginecol Obstet Mex* 2021;89:115-28.
35. Nappi RE, Palacios S, Bruyniks N, Particco M, Panay N; EVES Study investigators. The burden of vulvovaginal atrophy on women's daily living: implications on quality of life from a face-to-face real-life survey. *Menopause* 2019;26:485-91.
36. Watson LJ, James KE, Hatoum Moeller IJ, Mitchell CM. Vulvovaginal Discomfort Is Common in Both Premenopausal and Postmenopausal Women. *J Low Genit Tract Dis* 2019;23:164-9.
37. Clayton AH, Kingsberg SA, Goldstein I. Evaluation and management of hypoactive sexual desire disorder. *Sex Med* 2018;6:59-74.
38. Alperin M, Burnett L, Lukacz E, Brubaker L. The mysteries of menopause and urogynecologic health: clinical and scientific gaps. *Menopause* 2019;26:103-11.
39. Fernández-Alonso AM, Cuerva MJ, Chedraui P, Pérez-López FR. Screening and management of female sexual dysfunction during the second half of life. In: *Postmenopausal diseases and disorders*. Springer International Publishing; 2019. p. 165-85.
40. Pérez-López FR, Vieira-Baptista P, Phillips N, Cohen-Sacher B, Fialho SCAV, Stockdale CK. Clinical manifestations and evaluation of postmenopausal vulvovaginal atrophy. *Gynecol Endocrinol* 2021;37:740-5.
41. Palacios S, Cancelo MJ, Castelo Branco C, Llaneza P, Molero F, Borrego RS. Vulvar and vaginal atrophy as viewed by the Spanish REVIVE participants: Symptoms, management and treatment perceptions. *Climacteric* 2017;20:55-61.
42. Avis NE, Brockwell S, Randolph JF Jr, Shen S, Cain VS, Ory M, et al. Longitudinal changes in sexual functioning as women transition through menopause: results from the Study of Women's Health Across the Nation. *Menopause* 2009;16:442-52.
43. Worsley R, Bell RJ, Gartoulla P, Davis SR. Prevalence and predictors of low sexual desire, sexually related personal distress, and hypoactive sexual desire dysfunction in a community-based sample of midlife women. *J Sex Med* 2017;14:675-86.
44. Ruan X, Zhang L, Cui Y, Gu M, Mueck AO. Genitourinary syndrome of menopause in Chinese perimenopausal and postmenopausal women. *Climacteric* 2021;24:297-304.
45. Meeta M, Majumdar S, Tanvir T, Sharma S, Shah J, Aggarwal N, et al. Effects of Menopause on Sexual Function in Indian Women: A McCoy's Questionnaire-Based Assessment. *J Midlife Health* 2021;12:144-54.
46. Palacios S, González SP, Fernández-Abellán M, Manubens M, García-Alfaro P; EVES Study Spanish investigators. Impact Of Vulvovaginal Atrophy Of Menopause In Spanish Women: Prevalence And Symptoms According To The EVES Study. *Sex Med* 2019;7:207-16.
47. Nappi RE, Mattsson LÅ, Lachowsky M, Maamari R, Giraldi A. The CLOSER survey: impact of postmenopausal vaginal discomfort on relationships between women and their partners in Northern and Southern Europe. *Maturitas* 2013;75:373-9.
48. Avis NE, Colvin A, Karlamangla AS, Crawford S, Hess R, Waetjen LE, et al. Change in sexual functioning over the menopausal transition: results from the Study of Women's Health Across the Nation. *Menopause* 2017;24:379-90.
49. Chua Y, Limpaphayom KK, Cheng B, Ho CM, Sumapradja K, Altomare C, et al. Genitourinary syndrome of menopause in five Asian countries: results from the Pan-Asian REVIVE survey. *Climacteric* 2017;20:367-73.