RESEARCH PAPER

# Prevalence of Genitourinary Syndrome Among Perimenopausal and Postmenopausal Women in a Tertiary Care Hospital: A Cross-Sectional Analytical Study

**Dr. Elakkiya S[1*], Dr. T. S. Meena[2], Dr. Manoshi Chouhan[3], Dr. Vidhya R[4]**

[1*] Final Year Postgraduate, Department of Obstetrics and Gynaecology, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research (BIHER), 7, CLC Works Road, Shankar Nagar, Chrompet, Chennai – 600044, India. (Corresponding Author) Email: elakkiyasambasivam761@gmail.com

[2] Professor and Head of Department, Department of Obstetrics and Gynaecology, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research (BIHER), 7, CLC Works Road, Shankar Nagar, Chrompet, Chennai – 600044, India. Email: meenats@gmail.com

[3] Assistant Professor, Department of Obstetrics and Gynaecology, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research (BIHER), 7, CLC Works Road, Shankar Nagar, Chrompet, Chennai – 600044, India. Email: manoshi6chouhan@gmail.com

[4] Professor, Department of Obstetrics and Gynaecology, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research (BIHER), 7, CLC Works Road, Shankar Nagar, Chrompet, Chennai – 600044, India. Email: vidhyarajan3@gmail.com

**Received:** 20th Feb, 2026 | **Revised:** 4th Mar, 2026 | **Accepted:** 25th Mar, 2026 | **Available Online:** 10th Apr, 2026

**ABSTRACT**

**Introduction:** Genitourinary Syndrome of Menopause (GSM) is a common but underdiagnosed condition affecting perimenopausal and postmenopausal women due to estrogen deficiency. It includes a spectrum of genital, sexual, and urinary symptoms that significantly impair quality of life. The present study aimed to determine the prevalence of GSM and its associated risk factors among women attending a tertiary care hospital.

**Methodology:** A hospital-based cross-sectional analytical study was conducted among 110 perimenopausal and postmenopausal women aged ≥40 years. Participants were selected using simple random sampling. Data were collected using a structured questionnaire, Vaginal Health Index Score (VHIS), and Urinary Distress Inventory-6 (UDI-6). Statistical analysis was performed using descriptive and inferential methods, with $p < 0.05$ considered significant.

**Results:** The majority of participants were aged 46–50 years (32.7%), and 58.2% were postmenopausal. The overall prevalence of GSM was 38.2% (42/110). Vaginal dryness (36.4%) was the most common symptom, followed by itching/burning (30.9%), urinary urgency (29.1%), dyspareunia (25.5%), and dysuria (23.6%). VHIS scores <15, indicating vulvovaginal atrophy, were observed in 34.5% of women, with a mean score of 16.8 ± 3.5. GSM showed significant association with age (p=0.001), menstrual status (p=0.001), duration of menopause (p=0.002), BMI (p=0.010), comorbidities (p=0.003), and parity (p=0.030).

**Conclusion:** GSM is a prevalent condition influenced by multiple factors. Early screening, increased awareness, and timely management are essential to improve quality of life among affected women.

**Keywords:** Genitourinary Syndrome; Perimenopause; Postmenopause; Vaginal Health Index Score; Urinary Symptoms; Dyspareunia; Menopausal Health.

**How to cite this article:** Elakkiya S, Meena TS, Chouhan M, Vidhya R. Prevalence of Genitourinary Syndrome Among Perimenopausal and Postmenopausal Women in a Tertiary Care Hospital: A Cross-Sectional Analytical Study. Int J Drug Deliv Technol. 2026;16(31s):8-14. DOI: 10.25258/ijddt.16.31s.2

**Source of support:** Nil.

**Conflict of interest:** The authors declare no conflict of interest.

## Introduction

Menopause is a natural biological process defined as the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. It is typically diagnosed after 12 consecutive months of amenorrhea and usually occurs between 45 and 55 years of age, with the mean age in Indian women being around 46 years [1,2]. The transition phase leading to menopause, known as perimenopause, is characterized by hormonal fluctuations, irregular menstrual cycles,

and the onset of various systemic symptoms [3]. With increasing life expectancy, women now spend nearly one-third of their lives in the postmenopausal phase, making menopausal health a significant public health concern.

One of the most under-recognized yet highly prevalent conditions associated with menopause is Genitourinary Syndrome of Menopause (GSM). GSM is a comprehensive term introduced in 2014 to replace the older term vulvovaginal atrophy (VVA), encompassing a spectrum of genital, sexual, and urinary symptoms related to estrogen deficiency [4]. These symptoms include vaginal dryness, itching, burning, dyspareunia, urinary urgency, dysuria, and recurrent urinary tract infections, which significantly impair the quality of life of affected women [5,6].

The pathophysiology of GSM is primarily attributed to decreased estrogen levels, leading to thinning of the vaginal epithelium, reduced blood flow, decreased elasticity, and diminished lubrication. Additionally, estrogen deficiency alters the vaginal microbiome, reducing lactobacilli and increasing susceptibility to infections [7,8]. Despite its high prevalence, GSM remains underdiagnosed and undertreated due to social stigma, lack of awareness, and reluctance among women to discuss genitourinary symptoms [6].

Studies across different populations have reported varying prevalence rates of GSM, ranging from 27% to 84%, depending on the population studied and diagnostic criteria used [9,10]. In developing countries like India, the burden may be even higher due to limited healthcare access and cultural barriers. Furthermore, several factors such as age, duration of menopause, parity, comorbidities like diabetes and hypertension, and lifestyle factors influence the occurrence and severity of GSM [11,12].

Early identification and appropriate management of GSM are essential to improve the quality of life and sexual health of women. However, routine screening for GSM is often neglected in clinical practice. Therefore, this study aims to assess the prevalence of GSM and identify associated risk factors among perimenopausal and postmenopausal women attending a tertiary care hospital.

**Methodology**

A hospital-based cross-sectional analytical study in the Department of Obstetrics and Gynaecology at a tertiary care hospital. The study population included perimenopausal and postmenopausal women attending the gynecology outpatient department (OPD) during the study period of three months.

Based on the study conducted by Zhu et al., [9] the prevalence of GSM among perimenopausal and postmenopausal women was found to be approximately 35%, at a confidence interval of 96% and an absolute error of 10%. Participants were selected using simple random sampling from the daily OPD attendance list, ensuring that eligible women were recruited in an unbiased manner.

Women aged 40 years and above who were either perimenopausal or postmenopausal and willing to provide informed consent were included in the study. Women receiving hormone replacement therapy, those with genital malignancies, hyperestrogenic states, active genital infections, or those unwilling to participate were excluded.

Data were collected using a pretested structured questionnaire divided into three parts. Part A included sociodemographic and clinical details such as age, educational status, menstrual status, duration of menopause, parity, mode of delivery, sexual activity, comorbidities, and body mass index (BMI). Anthropometric measurements, including height and weight, were recorded using standard procedures, and BMI was calculated accordingly.

Part B consisted of vaginal health assessment using the Vaginal Health Index Score (VHIS), which evaluated vaginal elasticity, fluid volume, pH, epithelial integrity, and moisture. Each parameter was scored from 1 to 5, with a total score ranging from 5 to 25. A score of less than 15 was considered indicative of vulvovaginal atrophy. Participants were also assessed for symptoms of genitourinary syndrome of menopause, including vulvovaginal, sexual, and urinary symptoms.

Part C included the Urinary Distress Inventory-6 (UDI-6) questionnaire to assess urinary symptoms and their severity. Based on responses, urinary incontinence was categorized into stress, urge, or mixed types.

All data were entered and analyzed using appropriate statistical software. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used. Inferential statistics, including chi-square test and logistic regression analysis, were applied to identify associations and independent predictors. A p-value of $<0.05$ was considered statistically significant. Strict confidentiality was maintained, and informed consent was obtained from all participants prior to data collection.

**Results**

The study included 110 participants, with the majority belonging to the age group of 46–50 years (36, 32.7%),

followed by 51–55 years (30, 27.3%), 40–45 years (28, 25.5%), and >55 years (16, 14.5%). This indicates that most women were in the late perimenopausal and early postmenopausal age groups. Regarding educational status, the highest proportion had secondary education (38, 34.5%), followed by primary education (32, 29.1%), while illiterate and graduate-level participants each constituted 18.2% (20 each). In terms of menstrual status, a greater proportion of women were postmenopausal (64, 58.2%) compared to perimenopausal women (46, 41.8%). (Table 1)

Table 1: Socio-demographic Characteristics of Study Participants (n = 110)

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age (years) | 40–45 | 28 | 25.5 |
| | 46–50 | 36 | 32.7 |
| | 51–55 | 30 | 27.3 |
| | >55 | 16 | 14.5 |
| Educational Status | Illiterate | 20 | 18.2 |
| | Primary | 32 | 29.1 |
| | Secondary | 38 | 34.5 |
| | Graduate & above | 20 | 18.2 |
| Menstrual Status | Perimenopausal | 46 | 41.8 |
| | Postmenopausal | 64 | 58.2 |

Among postmenopausal women (n=64), the majority had a duration of menopause of less than 5 years (28, 43.8%), followed by 5–10 years (22, 34.4%) and more than 10 years (14, 21.8%). Regarding BMI, most participants were overweight (46, 41.8%), followed by normal BMI (42, 38.2%) and obese (22, 20.0%). Comorbidities were absent in 48 (43.6%) women, while 28 (25.5%) had diabetes mellitus, 22 (20.0%) had hypertension, and 12 (10.9%) had both conditions. In terms of parity, the majority of women had more than two children (66, 60.0%), while 44 (40.0%) had parity of two or less. (Table 2)

Table 2: Clinical Characteristics of Participants (n = 110)

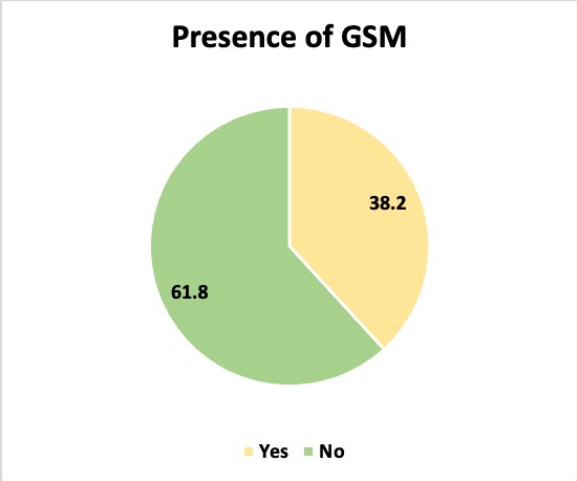
| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Duration of Menopause | <5 years | 28 | 43.8 |
| | 5–10 years | 22 | 34.4 |
| | >10 years | 14 | 21.8 |
| BMI (kg/m²) | Normal (18.5–24.9) | 42 | 38.2 |
| | Overweight (25–29.9) | 46 | 41.8 |
| | Obese (≥30) | 22 | 20.0 |
| Comorbidities | None | 48 | 43.6 |
| | Diabetes Mellitus | 28 | 25.5 |
| | Hypertension | 22 | 20.0 |
| | Both DM & HTN | 12 | 10.9 |
| Parity | ≤2 | 44 | 40.0 |
| | >2 | 66 | 60.0 |

The overall prevalence of Genitourinary Syndrome of Menopause (GSM) in the study population was 38.2% (42 out of 110). Among the symptoms, vaginal dryness was the most commonly reported complaint (40, 36.4%), followed by vaginal itching/burning (34, 30.9%), urinary urgency (32, 29.1%), dyspareunia (28, 25.5%), and dysuria (26, 23.6%). These findings highlight that both genital and urinary symptoms are common among perimenopausal and postmenopausal women. (Figure 1, Table 3)

Table 3: Symptoms of GSM (n = 110)

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Vaginal Dryness | Present | 40 | 36.4 |
| Vaginal Itching/Burning | Present | 34 | 30.9 |
| Dyspareunia | Present | 28 | 25.5 |
| Urinary Urgency | Present | 32 | 29.1 |
| Dysuria | Present | 26 | 23.6 |

Figure 1: Prevalence of GSM




Based on VHIS assessment, 38 (34.5%) women had scores less than 15, indicating vulvovaginal atrophy, while 72 (65.5%) had normal vaginal health. The mean VHIS score was 16.8 ± 3.5, suggesting that a substantial proportion of women had borderline or reduced vaginal health, consistent with menopausal changes. (Table 4)

Table 4: Vaginal Health Index Score (VHIS) Distribution (n = 110)

| VHIS Score | Interpretation | Frequency (n) | Percentage (%) |
|---|---|---|---|
| <15 | Vulvovaginal Atrophy | 38 | 34.5 |
| ≥15 | Normal | 72 | 65.5 |

A statistically significant association was observed between age and GSM (p = 0.001). The prevalence of GSM increased with advancing age. Among women aged 40–45 years, only 6 out of 28 had GSM, whereas in the >55 years age group, 12 out of 16 women were affected. This indicates that older women are more likely to develop GSM.

Educational status also showed a significant association (p = 0.020). GSM was more common among illiterate women (12 out of 20) and those with primary education (14 out of 32), compared to women with secondary education (10 out of 38) and graduates (6 out of 20). This suggests that lower educational status may be associated with higher prevalence, possibly due to reduced awareness and healthcare-seeking behavior.

A strong association was found with menstrual status (p = 0.001). Among perimenopausal women, only 10 out of 46 had GSM, whereas among postmenopausal women, 32 out of 64 were affected. This highlights that GSM is significantly more prevalent after menopause.

Among postmenopausal women, duration of menopause was significantly associated with GSM (p = 0.002). Women with menopause duration of more than 10 years had the highest prevalence (12 out of 14), compared to those with 5–10 years (12 out of 22) and less than 5 years (8 out of 28). This indicates that longer estrogen deficiency increases the risk of GSM.

Body Mass Index (BMI) showed a significant association (p = 0.010). GSM was more prevalent among overweight (18 out of 46) and obese women (14 out of 22) compared to women with normal BMI (10 out of 42), suggesting that increased body weight may contribute to the development of GSM.

There was a statistically significant association between comorbidities and GSM (p = 0.003). Women with both diabetes mellitus and hypertension had the highest prevalence (10 out of 12), followed by those with diabetes alone (12 out of 28) and hypertension (10 out of 22). In contrast, women without comorbidities had lower prevalence (10 out of 48). This indicates that chronic medical conditions increase the risk of GSM.

Finally, parity was also significantly associated with GSM (p = 0.030). Women with parity greater than 2 had higher prevalence (30 out of 66) compared to those with parity ≤2 (12 out of 44), suggesting that higher parity may be a contributing factor. (Table 5)

Table 5: Association Between GSM and Selected Variables (n = 110)

| Variable | Category | GSM Present (n=42) | GSM Absent (n=68) | p-value |
|---|---|---|---|---|
| **Age (years)** | 40–45 | 6 | 22 | **0.001*** |
| | 46–50 | 10 | 26 | |
| | 51–55 | 14 | 16 | |
| | >55 | 12 | 4 | |
| **Educational Status** | Illiterate | 12 | 8 | **0.020*** |
| | Primary | 14 | 18 | |
| | Secondary | 10 | 28 | |
| | Graduate & above | 6 | 14 | |
| **Menstrual Status** | Perimenopausal | 10 | 36 | **0.001*** |
| | Postmenopausal | 32 | 32 | |
| **Duration of Menopause** *(n=64)* | <5 years | 8 | 20 | **0.002*** |
| | 5–10 years | 12 | 10 | |
| | >10 years | 12 | 2 | |
| | Normal | 10 | 32 | |

| | | | | |
|---|---|---|---|---|
| **BMI (kg/m²)** | Overweight | 18 | 28 | **0.010*** |
| | Obese | 14 | 8 | |
| **Comorbidities** | None | 10 | 38 | **0.003*** |
| | Diabetes Mellitus | 12 | 16 | |
| | Hypertension | 10 | 12 | |
| | Both DM & HTN | 10 | 2 | |
| **Parity** | ≤2 | 12 | 32 | **0.030*** |
| | >2 | 30 | 36 | |

**Discussion**

The present hospital-based cross-sectional study evaluated the prevalence and determinants of Genitourinary Syndrome of Menopause (GSM) among perimenopausal and postmenopausal women, demonstrating that GSM is a significant and underrecognized health concern. In our study, the majority of participants belonged to the 46–50 years age group (32.7%), reflecting the late perimenopausal transition phase. This observation aligns with the work of Santoro N et al. [3], who described this age as a critical period of hormonal fluctuation, and Delamater L et al. [11], who emphasized that early menopausal transition is when symptoms begin to manifest prominently. The concordance between our age distribution and these studies reinforces the biological plausibility of GSM onset during this transitional phase.

The overall prevalence of GSM in our study was **38.2% (42/110)** , which is consistent with Zhu Y et al. [9], who reported a prevalence of approximately 35% in community-based populations. Similarly, the GENISSE study by Moral E et al. [10] reported prevalence ranging between 30% and 50% among postmenopausal women. However, Gandhi J et al. [8] documented comparatively higher prevalence rates, which may be attributed to broader diagnostic criteria and inclusion of more symptomatic populations. The similarity of our findings with global data suggests that GSM prevalence in Indian hospital-based settings is comparable to international estimates, despite sociocultural differences.

Symptom analysis in our study revealed that **vaginal dryness (36.4%) was the most common symptom**, followed by itching/burning (30.9%) and urinary urgency (29.1%) . This pattern is consistent with Faubion SS et al. [5] and Hodges AL et al. [6], who reported vaginal dryness and dyspareunia as predominant symptoms. While dyspareunia was reported in 25.5% of our participants, slightly lower than Western studies, this may reflect underreporting due to sociocultural barriers. The contribution of altered vaginal microbiota, particularly reduced lactobacilli, as described by Amabebe E et al. [7], provides a mechanistic explanation for symptoms such as irritation and burning observed in our cohort.

The mean Vaginal Health Index Score (VHIS) in our study was **16.8 ± 3.5**, with **34.5% of women having scores <15**, indicative of vulvovaginal atrophy . These findings are comparable to Alvisi S et al. [12], who demonstrated progressive deterioration in vaginal health parameters with declining estrogen levels. The proportion of women with suboptimal VHIS scores in our study highlights the substantial burden of subclinical or early GSM, even among women not actively seeking care for symptoms.

A significant association between GSM and advancing age was observed in our study (p=0.001), with prevalence increasing from **21.4% in 40–45 years to 75% in >55 years age group** . This trend is consistent with Gandhi J et al. [8], who reported worsening genitourinary symptoms with prolonged estrogen deficiency. Similarly, GSM was significantly higher among postmenopausal women (50%) compared to perimenopausal women (21.7%) in our study (p=0.001), supporting the hormonal basis of the condition as outlined in Indian Menopause Society guidelines by Meeta M et al. [2].

Duration of menopause emerged as an important determinant, with the highest prevalence observed among women with **>10 years since menopause (85.7%)** . This finding closely mirrors Zhu Y et al. [9], who demonstrated that longer duration of estrogen deprivation correlates with increased severity and persistence of GSM symptoms. This emphasizes that GSM is a progressive condition rather than a transient phase.

Educational status showed a statistically significant association (p=0.020), with higher prevalence among illiterate women (60%) and those with primary education (43.8%) . This observation is consistent with Moral E et al. [10], who highlighted that lower educational status contributes to poor awareness, delayed healthcare-seeking behavior, and underreporting of symptoms. This underscores the importance of health education interventions in reducing GSM burden.

Body Mass Index (BMI) was also significantly associated with GSM (p=0.010), with higher prevalence among obese women (63.6%) and overweight women (39.1%) compared to normal BMI individuals (23.8%) . This finding is supported by

Gandhi J et al. [8], who suggested that metabolic and inflammatory pathways may influence genitourinary tissue health. Additionally, comorbidities such as diabetes and hypertension showed strong associations (p=0.003), with the highest prevalence seen in women with both conditions (83.3%) . These findings indicate that vascular and metabolic dysfunction may exacerbate GSM symptoms.

Parity was another significant factor (p=0.030), with higher prevalence among women with parity >2 (45.5%) compared to ≤2 (27.3%) . This supports the hypothesis that repeated childbirth may contribute to pelvic floor weakening and long-term genitourinary changes, as suggested in previous literature on pelvic health.

Overall, our study confirms that GSM is a **multifactorial condition influenced by hormonal deficiency, aging, metabolic status, reproductive history, and socioeconomic factors**. The integration of objective measures (VHIS) with symptom assessment strengthens the validity of our findings and highlights the need for routine screening in clinical practice.

**Limitations**

Despite its strengths, this study has certain limitations. The cross-sectional design limits causal inference between risk factors and GSM. Being a single-center hospital-based study, the findings may not be generalizable to the broader community, particularly rural populations. Self-reported symptoms are subject to recall and social desirability bias, especially for sensitive domains such as sexual health. The sample size (n=110), although adequate for prevalence estimation, may limit the robustness of subgroup analyses. Furthermore, psychosocial, sexual function, and quality-of-life domains were not explored in depth, which could have provided a more comprehensive understanding of GSM burden.

**Conclusion**

The present study highlights that Genitourinary Syndrome of Menopause (GSM) is a common condition among perimenopausal and postmenopausal women, with a prevalence of 38.2%. Vaginal dryness, itching, and urinary symptoms were the most frequently reported complaints, significantly affecting the quality of life. The study identified important factors associated with GSM, including advancing age, postmenopausal status, longer duration of menopause, higher BMI, presence of comorbidities, and higher parity. These findings emphasize that GSM is a multifactorial condition influenced by hormonal, metabolic, and lifestyle factors.

Despite its high prevalence, GSM often remains underdiagnosed due to lack of awareness and hesitation in seeking medical care. Therefore, routine screening, early diagnosis, and appropriate management should be integrated into clinical practice. Increasing awareness among women and healthcare providers is essential to ensure timely intervention and improve overall well-being and quality of life in this population.

Funding: None

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

**References**

1. Mosconi L, Berti V, Dyke J, Schelbaum E, Jett S, Loughlin L, Jang G, Rahman A, Hristov H, Pahlajani S, Andrews R. Menopause impacts human brain structure, connectivity, energy metabolism, and amyloid-beta deposition. Scientific reports. 2021 Jun 9;11(1):10867.
2. Meeta M, Digumarti L, Agarwal N, Vaze N, Shah R, Malik S. Clinical practice guidelines on menopause:* An executive summary and recommendations: Indian Menopause Society 2019–2020. Journal of mid-life health. 2020 Apr 1;11(2):55-95.
3. Santoro N. Perimenopause: from research to practice. Journal of women's health. 2016 Apr;25(4):332-9.
4. Briggs P. Genitourinary syndrome of menopause. Post reproductive health. 2020 Jun;26(2):111-4.
5. Faubion SS, Sood R, Kapoor E. Genitourinary syndrome of menopause: management strategies for the clinician. InMayo Clinic Proceedings 2017 Dec 1 (Vol. 92, No. 12, pp. 1842-1849). Elsevier.
6. Hodges AL, Holland AC, Dehn B, Pace DT. Diagnosis and treatment of genitourinary syndrome of menopause. Nursing for women's health. 2018 Oct 1;22(5):423-30.
7. Amabebe E, Anumba DO. The vaginal microenvironment: the physiologic role of lactobacilli. Frontiers in medicine. 2018 Jun 13;5:389042.
8. Gandhi J, Chen A, Dagur G, Suh Y, Smith N, Cali B, Khan SA. Genitourinary syndrome of menopause: an overview of clinical manifestations, pathophysiology, etiology,

evaluation, and management. American journal of obstetrics and gynecology. 2016 Dec 1;215(6):704-11.

9. Zhu Y, Wei J, Yang X, Zhu W, Zhang W. Investigation on prevalence and risk factors associated with genitourinary syndrome of menopause in middle-aged and older women in Beijing community: a cross sectional study. BMC Women's Health. 2022 Dec 30;22(1):558.
10. Moral E, Delgado JL, Carmona F, Caballero B, Guillán C, González PM, Suárez-Almarza J, Velasco-Ortega S, Nieto C, writing group of the GENISSE study. Genitourinary syndrome of menopause. Prevalence and quality of life in Spanish postmenopausal women. The GENISSE study. Climacteric. 2018 Mar 4;21(2):167-73.
11. Delamater L, Santoro N. Management of the perimenopause. Clinical obstetrics and gynecology. 2018 Sep 1;61(3):419-32.
12. Alvisi S, Gava G, Orsili I, Giacomelli G, Baldassarre M, Seracchioli R, Meriggiola MC. Vaginal health in menopausal women. Medicina. 2019 Sep 20;55(10):615.