

## ORIGINAL ARTICLE

# Thematic Analysis of ChatGPT's Menopause-Related Patient Education Responses from a Women's Health Nursing Perspective

Hatice Bulut<sup>1</sup>, Samar Alotaibi<sup>2</sup>

<sup>1</sup>Division of Obstetrics and Gynecologic Nursing, Department of Nursing, Süleyman Demirel University Faculty of Health Sciences, Isparta, Türkiye

<sup>2</sup>Department of Maternal and Child Health Nursing, College of Nursing, Shaqra University, Al Dawadmi, Saudi Arabia

## Abstract

**Introduction:** This study aimed to evaluate ChatGPT's patient education content on menopause from the perspective of women's health nursing and to identify emerging themes in its responses.

**Methods:** A qualitative design was employed. Fifteen scenarios covering common nursing counselling topics in menopause were developed and presented to ChatGPT with instructions to use "patient-friendly language." The responses were analysed using Braun and Clarke's six-phase thematic analysis method.

**Results:** Four main themes emerged: (1) Symptom-focused practical suggestions, (2) lifestyle modification and preventive health, (3) psychosocial support and relationships, and (4) safety and compliance. Most responses demonstrated empathy but lacked sufficient scientific references and evidence-based support.

**Discussion and Conclusion:** ChatGPT can provide useful and understandable suggestions for patient education in menopause from a nursing perspective. However, improvements are needed in providing evidence-based references and addressing certain topics (e.g., sexual health) more comprehensively. Women's health nurses should verify the accuracy of AI-generated content before using it in patient education. These findings highlight the importance of developing nurses' skills in critically appraising, validating, and appropriately integrating AI-generated educational content into women's health counselling and patient education.

**Keywords:** Artificial intelligence; ChatGPT; Menopause; Patient education; Thematic analysis; Women's health nursing

Menopause is a natural phenomenon defined as the absence of menstruation for one year due to the depletion of ovarian function. The onset of natural menopause usually occurs between the ages of 45 and 55 years worldwide. It is estimated that the number of

postmenopausal women worldwide will reach 1.2 billion by 2030.<sup>[1]</sup> Symptoms of menopause vary and arise from the complex interplay of biological, psychological, and social factors. A decline in oestrogen levels may result in a wide range of symptoms, including hot flashes, night

**Cite this article as:** Bulut H, Alotaibi S. Thematic Analysis of ChatGPT's Menopause-Related Patient Education Responses from a Women's Health Nursing Perspective. *Lokman Hekim Health Sci* 2026;6(2):00–00.

**Correspondence:** Hatice Bulut, PhD. Süleyman Demirel Üniversitesi, Sağlık Bilimleri Fakültesi, Doğum ve Kadın Hastalıkları Hemşireliği Anabilim Dalı, Isparta, Türkiye

**E-mail:** haticebulut@sdu.edu.tr / hatice.phd.sheffield@gmail.com

**Submitted:** 29.09.2025 **Revised:** 07.01.2026 **Accepted:** 27.01.2026 **Available Online:** 21.05.2026



**OPEN ACCESS** This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).



sweats, fatigue, sleep disturbances, depression, cognitive difficulties, reduced sexual desire, and joint and muscle pain. Vasomotor symptoms, such as hot flashes and night sweats, are the most frequently reported, affecting up to 80% of women.<sup>[2]</sup> Although menopause is a shared biological process, sociocultural contexts influence women's experiences, resulting in varied approaches to coping with the transition.<sup>[3]</sup> The way women experience menopause can be negatively shaped by their health status, life history, and sociocultural environment.<sup>[4]</sup>

Nurses play a key role in providing evidence-based guidance, counselling, and support to women as they navigate the menopause transition.<sup>[5]</sup> An advanced nurse practitioner-led menopause clinic significantly improved overall quality of life and alleviated nearly all assessed menopausal symptoms, suggesting its value in expanding timely menopause care within the workforce.<sup>[6]</sup> Addressing menopausal symptoms and improving women's self-perception of aging require a holistic approach, in which clinicians and nurses integrate education, psychological support, and personalized care. By providing accurate, evidence-based information about the physiological changes associated with aging and menopause, healthcare professionals can help dispel stigma and prevent misconceptions.<sup>[7]</sup>

Recently, there has been a shift in healthcare toward the use of technology and artificial intelligence (AI). AI is increasingly seen as a valuable aid for physicians dealing with the complexities of menopause, presenting both opportunities and challenges.<sup>[8,9]</sup> Natural language processing offers a promising approach for providing customized recommendations for symptom management, menopausal hormone therapy, and alternative therapies, thereby optimizing care according to individual medical history and preferences.<sup>[10]</sup> However, a recent study found that, compared with an artificial intelligence-based program, a health-promotion-oriented intervention was more effective in improving menopausal women's knowledge and quality of life.<sup>[11]</sup> Therefore, achieving a balance between the use of AI and the preservation of human knowledge and empathy is critical.<sup>[12]</sup>

In light of this, it is important to evaluate the content of health education on menopause to ensure it supports informed decision-making, promotes patient-centered care, and addresses the complex biological, psychological, and social dimensions of the menopausal transition. Although several studies have explored the use of AI and chatbots in healthcare and patient education, few

have examined the quality of AI-generated educational content from a nursing perspective. To our knowledge, no studies have evaluated ChatGPT's menopause-related information through a women's health nursing lens. This study addresses this gap by analyzing ChatGPT's menopause education responses using scenario-based thematic analysis to explore its potential contributions and limitations in women's health counselling. Therefore, this study aimed to evaluate ChatGPT's patient education content on menopause from the perspective of women's health nursing and to identify emerging themes in the responses.

## Materials and Methods

### Study Design

This study was a qualitative study conducted digitally, independent of the clinical setting. The study design was informed by both authors' long-standing expertise in menopause and doctoral-level academic experience in women's health nursing and menopause. The study aimed to contextually evaluate ChatGPT-5 responses to patient education and counselling scenarios related to menopause. The scenarios were developed based on common menopausal symptoms and care recommendations outlined by the World Health Organization,<sup>[13]</sup> the National Health Service,<sup>[14]</sup> and the North American Menopause Society.<sup>[15,16]</sup>

### Type of Research

The research was based on a qualitative thematic analysis approach. For this purpose, 15 unique patient-language scenarios were developed, drawing on the menopause literature and a nursing care perspective. The scenarios were structured to cover common symptoms and care areas during menopause (e.g., vasomotor symptoms, sleep problems, vaginal dryness, osteoporosis risk, and psychosocial impacts).<sup>[13–16]</sup>

### Data Collection

Fifteen scenarios prepared by the researcher were individually submitted to ChatGPT in Turkish, and the model was specifically asked to use "patient-friendly language" in its responses. Only one response was generated for each scenario, and the resulting texts were transcribed into a written document without any modifications. The responses were systematically recorded and later incorporated into the qualitative analysis process. A full list of scenarios is presented in Table 1 and Appendix 1.

**Table 1.** Menopause scenarios included in the study

Scenario no	Scenario topic
1	Hot flush management (non-medication)
2	Night sweats
3	Vaginal dryness and pain
4	Urinary incontinence
5	Decreased libido
6	Osteoporosis prevention
7	Fall risk reduction
8	Heart health
9	Weight management
10	Sleep problems
11	Mood swings
12	Counselling about HRT
13	Herbal supplements
14	Workplace menopause support
15	Family support

HRT: Hormone replacement therapy.

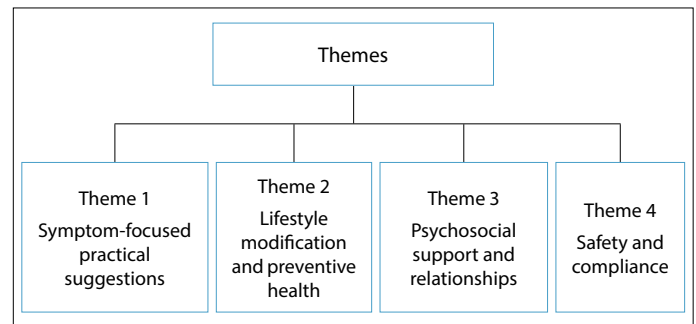
## Data Analysis

The responses obtained in the study were analysed using Braun and Clarke's thematic analysis method (2006).<sup>[17]</sup> In the first stage, all data generated by ChatGPT-5 were read multiple times by the researcher to ensure a comprehensive familiarity with the content. In the second stage, meaningful sections of the responses were systematically coded, and these codes were grouped according to shared content. Potential themes were then developed from the codes and subsequently reviewed and reorganized to ensure content consistency. In the final stage, the themes were finalized and interpreted within the context of a nursing care perspective. A sample coding table is presented in Table 2.

All scenarios were submitted in Turkish, and ChatGPT outputs were generated in Turkish. The Turkish outputs were retained verbatim as the source material. To facilitate collaborative analysis with an English-speaking co-researcher, the outputs were translated into English by the research team. The translations were checked against the original Turkish text during coding and theme development to ensure fidelity of meaning, and any discrepancies were resolved by consensus.

## Rigour and Reflexivity

Scientific rigour and reliability were ensured in this study through various strategies. Both the first and second researchers have worked in the field of menopause for more

**Figure 1.** Thematic map of the four main themes identified in the study.

than 10 years and completed their doctoral dissertations in this area. In addition, given the researcher's academic work on qualitative research methods and menopause, a reflexive approach was adopted, recognizing that her personal knowledge and experiences could influence the research process.

Specifically, during the data analysis process, systematic self-reflection was undertaken to reduce the risk of bias, in accordance with Braun and Clarke's (2006) thematic analysis approach.<sup>[17]</sup> All steps were implemented transparently. A reflexive approach, supported by both the researcher's field expertise and feedback from the second researcher, was maintained throughout the research process, thereby maximizing the reliability, validity, and scientific contribution of the findings.

## Ethical Approval

This research did not require ethics committee approval because it did not involve human participants. The study was conducted solely using responses from an AI model and did not involve any personal data.

## Results

The data obtained in this study revealed that recommendations addressing women's experiences during menopause are multidimensional. The thematic analysis identified four main themes, which were then organized into subcategories. Overall, the responses consisted of concrete suggestions directly related to each scenario and included practical tips that menopausal women could easily implement in their daily lives (Fig. 1).

### Theme 1 – Symptom-Focused Practical Suggestions

A substantial proportion of the responses offered practical solutions and suggestions for alleviating menopausal symptoms in daily life. These suggestions were symptom-specific, cost-effective, and readily applicable.

**Table 2.** Sample coding table

Scenario no	Quote from text	Code	Theme	Description
1	"Keep your bedroom cool (18–20°C may be ideal)."	Symptom management	Theme 1 – Symptom-Focused Practical Suggestions	Direct suggestion for alleviating vasomotor symptoms.
6	"Increase your daily calcium intake: milk, yogurt, cheese, almonds, green leafy vegetables."	Lifestyle suggestion	Theme 2 – Lifestyle Modification and Preventive Health	Nutritional suggestion against the risk of osteoporosis.
5	"Communicate openly and honestly with your partner; share your feelings and expectations."	Psychosocial support	Theme 3 – Psychosocial Support and Relationships	Communication-based suggestion for decreased sexual desire.
12	"Like any medication, it has risks: the risk of breast cancer, blood clots, and stroke may increase."	Risk warning	Theme 4 – Safety and Compliance	Warning that draws attention to the potential risks of HRT.

HRT: Hormone replacement therapy.

### Subtheme 1.1: Management of Physical Symptoms

In scenarios related to vasomotor symptoms (hot flushes and night sweats), the responses suggested practical strategies such as regulating ambient temperature, choosing lightweight clothing, and taking cool showers or drinking cold beverages. The responses indicated that hot flushes disrupt daily quality of life, making cooling measures during sleep particularly important.

*"For hot flushes, keep a bottle of cold water by your bed at night, and have a thin spare pyjama set ready if needed." (Scenario 1)*

For vasomotor symptoms (hot flushes and night sweats), the responses also offered low-cost and practical recommendations, such as maintaining a cool environment, wearing cotton clothing, drinking cold beverages, and using soothing measures during sleep.

*"Try to keep your environment cool during the day and while sleeping." (Scenario 1)*

*"Keep your bedroom cool (18–20°C may be ideal)." (Scenario 2)*

The responses highlighted the use of lubricants, hygiene recommendations, and pelvic floor exercises for vaginal dryness, while Kegel exercises, fluid management, and weight control were emphasized for urinary incontinence.

*"Use water-based lubricants; be cautious, as oil-based products can weaken condoms." (Scenario 3)*

*"Do Kegel exercises three times a day, 10 repetitions each: tighten the muscles as if trying to stop urine flow, hold for 5 seconds, then release." (Scenario 4)*

### Subtheme 1.2: Behavioral Regulation and Psychosocial Approaches

Responses to the scenarios frequently emphasized the need to avoid foods and beverages thought to exacerbate menopausal symptoms. Spices, caffeine, alcohol, and hot drinks, in particular, were repeatedly cited as triggers of hot flushes.

*"Avoid spicy foods, hot beverages, caffeine, and alcohol, as they can trigger hot flushes." (Scenario 1)*

The responses also emphasized that stress can exacerbate symptoms and that methods such as relaxation exercises, deep breathing techniques, and yoga can be beneficial. This suggests that symptoms are linked not only to biological but also to psychological processes.

*"Find ways to reduce your stress: deep breathing exercises, gentle yoga, meditation." (Scenario 1)*

*"Relaxation activities such as yoga, meditation, and breathing exercises may positively influence sexual desire." (Scenario 5)*

*"Remember that stress, fatigue, and emotional state play an important role in sexual desire; make time for rest." (Scenario 5)*

### Theme 2 – Lifestyle Modification and Preventive Health

This theme encompasses lifestyle recommendations aimed at reducing long-term health risks and improving quality of life during menopause. Responses are grouped around both health-promoting approaches based on nutrition and physical activity and preventive measures such as avoiding harmful habits and maintaining good sleep hygiene.

### **Subtheme 2.1: Healthy Nutrition and Regular Physical Activity**

The responses recommended that women consume foods rich in calcium and vitamin D, increase their intake of fruits and vegetables, and choose whole grains and healthy fats. These recommendations appear to reflect a preventive approach to bone health and metabolic balance.

*"Increase your daily calcium intake: milk, yogurt, cheese, almonds, leafy green vegetables." (Scenario 6)*

Regular exercise was highlighted as beneficial for both cardiovascular and musculoskeletal health. Recommendations generally focused on activities that are easily accessible, such as walking, yoga, and light jogging.

*"Engage in at least 150 minutes of moderate-intensity walking or exercise per week." (Scenario 8)*

### **Subtheme 2.2: Avoiding Harmful Habits and Sleep Hygiene**

A substantial proportion of the responses identified smoking and alcohol use as factors that worsen menopausal symptoms and increase long-term health risks. Some responses made direct connections, such as smoking triggering cough and urinary incontinence.

*"If you smoke, quit; coughing can increase urinary incontinence." (Scenario 4)*

For women experiencing sleep problems, recommendations emphasized establishing a bedtime routine, reducing screen use, maintaining good sleep hygiene, and practicing relaxation techniques.

*"Stop using electronic devices at least one hour before sleep." (Scenario 10)*

## **Theme 3 – Psychosocial Support and Relationships**

The responses indicated that menopause is not only a biological process but also a psychosocial one. The suggestions generated by ChatGPT offered supportive strategies across a wide range of topics, from communication with partners and family to workplace conditions.

### **Subtheme 3.1: Support in Intimate Relationships (Partner, Family, and Psychological Resilience)**

The impact of menopause on sexual desire and family dynamics was highlighted. In scenarios such as decreased sexual desire, the responses emphasized the importance of open communication and emotional sharing. It was noted that empathetic communication with a partner can improve relationship harmony.

*"Communicate openly and honestly with your partner; share your feelings and expectations." (Scenario 5)*

The responses also suggested that family members can be understanding of women experiencing menopause and provide support with household responsibilities. These suggestions indicate that menopause also affects family relationships.

*"Do not belittle or dismiss her feelings." (Scenario 15)*

Strategies such as journaling, exercise, breathing techniques, and, when necessary, professional psychological support were recommended for managing stress, anger, and emotional fluctuations.

*"Express your feelings by keeping a diary." (Scenario 11)*

### **Subtheme 3.2: Support Mechanisms in Work and Social Life**

The effects of menopause on working life were highlighted, and the responses suggested that adjustments should be made to the work environment. Recommendations included improving ventilation, allowing cooling-off breaks, and adopting a flexible dress code. This underscores the need to address menopause as a process integrated with women's professional identities.

*"Ensure good ventilation in the work environment." (Scenario 14)*

## **Theme 4 – Safety and Compliance**

This theme encompasses both clinical-level medical risks and safety warnings, as well as recommendations appropriate to the cultural and environmental context of daily life.

### **Subtheme 4.1: Clinical and Daily Safety**

The responses emphasized both the benefits of hormone replacement therapy (HRT) and its potential risks (e.g., breast cancer, thrombosis, and stroke). Similarly, it was noted that herbal products should be used with caution due to possible side effects and drug interactions.

*"Like any medication, it carries risks: it can increase the risk of breast cancer, blood clots, and stroke." (Scenario 12)*

*"If you are taking blood thinners, blood pressure medication, or hormone-related treatments, always consult your doctor first." (Scenario 13)*

Precautions that can be taken in the home environment (e.g., non-slip carpeting, good lighting, and well-organized walking areas) were highlighted, particularly in relation to the increased risk of falls with age.

"Organize walking areas at home; remove cables or rug edges that could cause tripping." (Scenario 7)

#### **Subtheme 4.2: Cultural and Local Adaptation**

The responses highlighted suggestions that were appropriate to the climate and living conditions in Turkish society. In particular, recommendations related to clothing choices (e.g., cotton underwear and comfortable clothing) and home arrangements (e.g., carpets and lighting) reflected adaptation to the local context.

*"Prefer cotton underwear; avoid tight and synthetic clothing." (Scenario 3)*

*"Take precautions at home to reduce the risk of falls (non-slip rugs, proper lighting)." (Scenario 6)*

### **Discussion**

This study examined ChatGPT's responses to scenarios related to menopause patient education from a women's health nursing perspective through thematic analysis. The findings indicate that an AI-based language model can provide empathetic, understandable, and practical advice for patient education related to menopause, but that it lacks context regarding sexual health, emotional support, and references to scientific sources. These findings are important because they provide an early assessment of how large-scale language models such as ChatGPT can serve as helpful tools in nursing practice and women's health education.

The four main themes arising from the thematic analysis demonstrate that the menopause experience is not merely a biological process but is also closely linked to psychological, social, and environmental factors. Our findings support the biopsychosocial model, which is widely accepted in the international literature on menopause management.<sup>[18,19]</sup> One of the most striking findings of our study is that ChatGPT addressed not only the biological but also the psychosocial dimensions of menopause, aligning with the biopsychosocial approach that underpins nursing. The ability of an AI system to address a health issue within its relational and social context suggests that this technology has the potential to go beyond superficial information transfer in patient education.

In this study, ChatGPT's practical recommendations for daily living, such as staying in a cool environment, choosing cotton and sweat-absorbing clothing, and avoiding triggers (alcohol, spices, and hot drinks), align with the literature indicating their effectiveness in managing mild hot flushes. Evidence also suggests that lifestyle changes can reduce

symptoms and that such environmental measures may be effective.<sup>[20,21]</sup> Furthermore, hot flushes have been shown to be physiologically triggered by small increases in body temperature resulting from a narrowing of the thermoneutral zone. This indicates that recommendations for regulating environmental temperature are scientifically grounded.<sup>[21]</sup>

The study found that psychological approaches, such as stress management, relaxation exercises, and breathing techniques recommended by ChatGPT, may play a supportive role in alleviating vasomotor symptoms. This finding is consistent with the results of a systematic review suggesting that psychological interventions, particularly cognitive behavioral therapy and relaxation techniques, may be effective in treating hot flushes in healthy postmenopausal women.<sup>[22]</sup>

The findings indicate that ChatGPT emphasizes healthy eating, exercise, and the avoidance of harmful habits in menopause management. The literature also emphasizes the importance of regular physical activity and a balanced diet rich in calcium and vitamin D in reducing the risk of postmenopausal osteoporosis and cardiovascular disease.<sup>[23,24]</sup> In this respect, ChatGPT's responses can be said to reflect a preventive health approach. However, the recommendations were mostly general and did not include details such as personalized exercise or nutrition plans.

A significant shortcoming in ChatGPT's responses is the lack of evidence-based source citations. Research suggests that the model can provide empathetic and understandable answers to patient questions, but the content is not always sufficient in terms of scientific accuracy.<sup>[25]</sup> Similarly, some systematic reviews have shown that although ChatGPT demonstrates high accuracy in certain medical fields, it can be inconsistent in specialized topics.<sup>[26]</sup> Therefore, it is important for nurses not to rely on AI-generated content directly, but to evaluate it by comparing it with existing guidelines.

The emphasis placed on partner, family, and workplace support in ChatGPT's responses is striking. This demonstrates that AI approaches menopause not only as a biological process, as emphasized in the literature, but also as a holistic biopsychosocial and cultural process that can affect women's sexual and intimate relationships.<sup>[27-29]</sup> Research has shown that menopausal women's experiences are shaped by deep and complex psychosocial dynamics, such as feeling a "duty" or "obligation" to meet their partner's needs in order to maintain the relationship, even when they themselves lack sexual desire.<sup>[27,28]</sup> However, ChatGPT's recommendations on this topic remain superficial.

Nevertheless, the safe use of AI in healthcare places significant ethical responsibilities on nurses. AI can provide generalized, non-personalized answers that may not apply to everyone because of biases in the data on which it is trained. At this point, the nurse's role is to critically assess the information provided by AI in order to prevent potential harm. In other words, nurses should personalize care by filtering AI-generated information and adapting it to the patient's specific situation.<sup>[30,31]</sup>

### Strengths, Limitations and Implications

One of the key strengths of this study is its evaluation of ChatGPT-5. While most previous studies have been limited to versions based on GPT-3.5 or GPT-4, this research demonstrates the current capabilities of AI-based chatbots. Accordingly, the findings not only provide a comparative perspective on earlier versions but also illustrate how current technology may contribute to patient education practices in women's health nursing. Furthermore, to our knowledge, this is the first study to examine ChatGPT's responses for menopause-related patient education from a women's health nursing perspective. In this respect, the study makes an original and pioneering contribution to the literature.

Another key strength of this study is the systematic, scenario-based evaluation of an AI-based tool such as ChatGPT in the context of menopause. The research examined responses not only across individual symptoms but also across multidimensional domains such as lifestyle, psychosocial relationships, and cultural context. This approach offers a unique contribution by demonstrating the scope of AI applications in women's health. Furthermore, the methodological framework, based on Braun and Clarke's (2006) six-stage thematic analysis, ensured that the findings were generated in a transparent and systematic manner.

The fact that the two researchers who conducted this study graduated from international universities, wrote their doctoral theses on menopause, and have published work on menopause can also be considered a strength of the study in terms of the perspective and analytical depth it provides.

The limitations of this study include the analysis of responses only in Turkish and the evaluation of responses from a single model. The exclusive use of Turkish-language scenarios may have influenced the nature and tone of ChatGPT's outputs, as linguistic and cultural nuances can shape how the model interprets and generates health-related information. In addition, because large language models are trained on extensive datasets that may contain linguistic, cultural, or contextual biases, the generated

responses may also reflect these limitations. Furthermore, this study was limited to content analysis; the actual effects of AI-generated responses on patients were not measured.

Future research could explore the effectiveness of ChatGPT-based educational interventions through experimental designs such as randomized controlled trials or user satisfaction surveys involving nursing students and menopausal women. These studies could assess the impact of AI-generated content on participants' knowledge, attitudes, and confidence in managing menopausal symptoms. In addition, future AI tools could be enhanced through integration with evidence-based guideline databases and digital health repositories (e.g., WHO and NICE), which would improve both the reliability and traceability of the information provided to patients.

In clinical practice, nurses can play a key role in ensuring that AI-generated educational materials are accurate and appropriate. To critically appraise such content, nurses should cross-check AI outputs against evidence-based clinical guidelines and national health recommendations, verify the reliability of cited information, and consider patients' cultural background and health literacy levels before using them. Furthermore, AI-based materials should be supplemented with nurse-led counselling and educational resources to ensure contextual relevance and accuracy. Strengthening nurses' digital health literacy and critical appraisal skills will be essential for the safe integration of AI tools into women's health education and counselling.

### Conclusion

In conclusion, ChatGPT has the potential to provide empathetic, actionable, and partially culturally appropriate recommendations for menopausal women. These findings suggest that ChatGPT can offer useful and understandable support for menopause patient education. From a women's health nursing perspective, ChatGPT may serve as a supportive tool, but its content requires careful verification for accuracy. Therefore, it is recommended that AI literacy courses be incorporated into nursing curricula and that healthcare professionals be trained to use this technology critically.

**Ethics Committee Approval:** The study did not involve human participants. Data was generated by artificial intelligence. Ethics committee approval was not required.

**Conflict of Interest:** The authors declare no conflicts of interest.

**Funding Statement:** The authors declared that this study has received no financial support.

**Acknowledgements:** The authors extend their appreciation to the OpenAI team.

**Use of AI for Writing Assistance:** ChatGPT was used for data collection. ChatGPT generated responses to pre-defined menopause scenarios (e.g., hot flush management, vaginal dryness, osteoporosis prevention). These AI outputs were thematically analysed by the research team and used as the primary qualitative data source for the study (as described in detail in the methods section).

**Data Availability Statement:** A data set will be available upon request.

**Author Contributions:** Concept: HB, SA; Design: HB, SA; Supervision: HB, SA; Materials: HB, SA; Data Collection or Processing: HB, SA; Analysis or Interpretation: HB, SA; Literature Search: HB, SA; Writing – original draft: HB, SA; Critical Reviews: HB, SA.

**Peer-review:** Double blind peer-reviewed.

## References

1. Afshari F, Bahri N, Sajjadi M, Mansoorian MR, Tohidinik HR. Menopause uncertainty: the impact of two educational interventions among women during menopausal transition and beyond. *Prz Menopauzalny* 2020;19(1):18-24. [Crossref]
2. El Khoudary SR, Greendale G, Crawford SL, Avis NE, Brooks MM, Thurston RC, et al. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause* 2019;26(10):1213-27. [Crossref]
3. Bahri N, Latifnejad Roudsari R. Moving from uncertainty toward acceptance: a grounded theory study on exploring Iranian women's experiences of encountering menopause. *J Psychosom Obstet Gynecol* 2020;41(2):154-64. [Crossref]
4. Talaulikar V. Menopause transition: Physiology and symptoms. *Best Pract Res Clin Obstet Gynaecol* 2022;81:3-7. [Crossref]
5. Flanagan MR, Fantasia HC. Comprehensive management of menopausal symptoms. *Nurs Womens Health* 2024;28(5):381-92. [Crossref]
6. Keye C. The Effect of an advanced nurse practitioner led menopause clinic on quality of life and menopausal symptoms. *Womens Health (Lond)* 2025;21:17455057251324573. [Crossref]
7. Wu J, Lu L, Jing L. Perspectives on improving self-perception of ageing and managing menopausal symptoms. *J Adv Nurs* 2026;82(3):2502-3. [Crossref]
8. Roa Diaz ZM, Muka T, Franco OH. Personalized solutions for menopause through artificial intelligence: Are we there yet? *Maturitas* 2019;129:85-6. [Crossref]
9. Rajkomar A, Dean J, Kohane I. Machine learning in medicine. *N Engl J Med* 2019;380(14):1347-58. [Crossref]
10. Garg R, Munshi A. Revolutionizing menopause management: Harnessing the potential of artificial intelligence. *J Midlife Health* 2024;15(2):53-4. [Crossref]
11. Abd Elkader Mohamed W, Gharib Ahmed S, Abo Bakr Abd Ellatif M. Effectiveness of health promoting based program versus artificial intelligence based program on quality of life among menopausal women. *Egypt J Heal Care* 2024;15(2):1411-32. [Crossref]
12. Vargas-Hernandez VM. Artificial intelligence in menopause management. *Mathews J Gynecol Obstet* 2025;9(1):1-4. [Crossref]
13. World Health Organization (WHO). Menopause. World Health Organization. 2024. Available at: <https://www.who.int/news-room/fact-sheets/detail/menopause> Accessed Feb 2, 2025.
14. National Health Service (NHS). Menopause symptoms. NHS. Available at: <https://www.nhs.uk/conditions/menopause/symptoms/> Accessed Feb 10, 2025.
15. North American Menopause Society (NAMS). Menopause topics. The North American Menopause Society. Available at: <https://menopause.org/patient-education/menopause-topics> Accessed Feb 10, 2025.
16. Shifren JL, Gass ML; NAMS Recommendations for Clinical Care of Midlife Women Working Group. The North American Menopause Society recommendations for clinical care of midlife women. *Menopause* 2014;21(10):1038-62. [Crossref]
17. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3(2):77-101. [Crossref]
18. Melby MK, Lock M, Kaufert P. Culture and symptom reporting at menopause. *Hum Reprod Update* 2005;11(5):495-512. [Crossref]
19. Melby MK, Lampl M. Menopause, a biocultural perspective. *Annu Rev Anthropol* 2011;40:53-70. [Crossref]
20. Bansal R, Aggarwal N. Menopausal hot flashes: a concise review. *J Midlife Health* 2019;10(1):6-13. [Crossref]
21. Freedman RR. Physiology of hot flashes. *Am J Hum Biol* 2001;13(4):453-64. [Crossref]
22. Samami E, Shahhosseini Z, Elyasi F. The effects of psychological interventions on menopausal hot flashes: A systematic review. *Int J Reprod Biomed* 2022;20(4):255-72. [Crossref]
23. El Khoudary SR, Aggarwal B, Beckie TM, Hodis HN, Johnson AE, Langer RD, et al. Menopause transition and cardiovascular disease risk: implications for timing of early prevention: a scientific statement from the American Heart Association. *Circulation* 2020;142(25):e506-e32. [Crossref]
24. National Health Service (NHS). Things you can do - Menopause. NHS. Available at: <https://www.nhs.uk/conditions/menopause/things-you-can-do/> Accessed Feb 20, 2025.
25. Ayers JW, Poliak A, Dredze M, Leas EC, Zhu Z, Kelley JB, et al. Comparing physician and artificial intelligence chatbot responses to patient questions posted to a public social media forum. *JAMA Intern Med* 2023;183(6):589-96. [Crossref]
26. Beheshti M, Toubal IE, Alaboud K, Almalaysha M, Ogundele OB, Turabieh H, et al. Evaluating the reliability of ChatGPT for health-related questions: a systematic review. *Informatics* 2025;12(1):1-23. [Crossref]
27. Bulut H. An interpretative phenomenological analysis of post-menopausal women's experiences of the menopause, its impact on their relationship and intimacy, and their coping methods [Doctoral dissertation]. United Kingdom: University of Sheffield; 2021.
28. Bulut H, Hinchliff S, Ali P, Piercy H. Women's experiences of intimate and sexual relationships during menopause: a qualitative synthesis. *J Clin Nurs* 2025;34(5):1543-54. [Crossref]

29. Hunter M, Rendall M. Bio-psycho-socio-cultural perspectives on menopause. *Best Pract Res Clin Obstet Gynaecol* 2007;21(2):261-74. [\[Crossref\]](#)
30. Magrabi F, Ammenwerth E, McNair JB, De Keizer NF, Hyppönen H, Nykänen P, et al. Artificial Intelligence in Clinical Decision Support: Challenges for Evaluating AI and Practical Implications. *Yearb Med Inform* 2019;28(1):128-34. [\[Crossref\]](#)
31. Giordano C, Brennan M, Mohamed B, Rashidi P, Modave F, Tighe P. Accessing artificial intelligence for clinical decision-making. *Front Digit Health* 2021;3:645232. [\[Crossref\]](#)

## **Appendix 1. Scenarios for Menopausal Women**

---

### **Scenario 1 – Managing Hot Flashes (Non-Pharmacological)**

---

#### **Question:**

As a nurse, what non-medication advice would you give to a woman frequently experiencing hot flashes during menopause? Use patient-friendly language.

#### **Answer:**

- Try to keep your environment cool during the day and while sleeping.
  - Choose loose, light-coloured cotton clothing; avoid synthetic fabrics.
  - Avoid spicy foods, hot beverages, caffeine, and alcohol as they can trigger hot flashes.
  - Find ways to reduce stress: deep breathing exercises, gentle yoga, or meditation.
  - Take a 30-minute brisk walk daily; regular exercise helps reduce hot flashes and improves mood.
  - Keep a bottle of cold water by your bed at night, and have a thin spare pyjama set ready if needed.
  - Drink plenty of water to help maintain your body's fluid balance.
- 

### **Scenario 2 – Night Sweats**

---

#### **Question:**

As a nurse, what suggestions would you give to improve sleep quality for a woman experiencing night sweats during menopause?

#### **Answer:**

- Keep your bedroom cool (18–20°C may be ideal).
  - Use breathable cotton sheets and pyjamas.
  - Avoid heavy meals, caffeine, and alcohol before bedtime.
  - Take a warm shower before sleep to regulate your body temperature.
  - Keep a spare pyjama set and a thin towel next to your bed.
  - Establish a regular sleep routine; try to go to bed and wake up at the same time every day.
  - Practice relaxation techniques before sleep (e.g., the 4-7-8 breathing technique).
- 

### **Scenario 3 – Vaginal Dryness and Pain**

---

#### **Question:**

As a nurse, what non-medication recommendations would you offer to a woman experiencing vaginal dryness and pain during intercourse in the menopausal period?

#### **Answer:**

- You can use water-based lubricants; be cautious, as oil-based products can weaken condoms.
  - Regular sexual activity or pelvic floor exercises can improve blood circulation in the area and help reduce dryness.
  - Avoid using soaps or scented products in the genital area, as they can disrupt the pH balance.
  - Drink plenty of water to help maintain overall hydration.
  - Prefer cotton underwear; avoid tight or synthetic clothing.
  - If the dryness becomes very uncomfortable, consult your doctor about low-dose vaginal moisturizers.
- 

### **Scenario 4 – Urinary Incontinence**

---

#### **Question:**

As a nurse, what pelvic floor exercises and lifestyle changes would you recommend to a woman experiencing urinary incontinence during menopause?

#### **Answer:**

- Do Kegel exercises three times a day, 10 repetitions each: tighten the muscles as if trying to stop urine flow, hold for 5 seconds, then release.
  - Avoid doing this exercise during urination regularly; it's okay initially to identify the muscles, but don't make it a habit.
  - Drink plenty of fluids, but limit caffeinated and carbonated drinks as they may irritate the bladder.
  - If you're overweight, losing weight in a healthy way can help reduce symptoms.
  - Quit smoking if you smoke; chronic coughing can worsen incontinence.
  - Try not to hold your urine; go to the toilet at regular intervals.
- 

### **Scenario 5 – Low Sexual Desire**

---

#### **Question:**

As a nurse, what recommendations would you give to a woman experiencing decreased sexual desire after menopause, including psychosocial support?

#### **Answer:**

- Communicate openly and honestly with your partner; share your feelings and expectations.

- Remember that stress, fatigue, and emotional state play an important role in sexual desire; make time for rest.
- Physical intimacy that you both enjoy (hugging, massage) can help increase closeness.
- Use lubricants if vaginal dryness is an issue.
- Relaxation activities such as yoga, meditation, and breathing exercises may positively influence sexual desire.
- Take time for self-care to boost self-confidence.

---

### Scenario 6 – Preventing Osteoporosis

---

**Question:**

As a nurse, what nutrition, exercise, and lifestyle recommendations would you give to reduce the risk of osteoporosis after menopause?

**Answer:**

- Increase your daily calcium intake: milk, yogurt, cheese, almonds, leafy green vegetables.
- Have your vitamin D levels checked; make sure to get regular sunlight.
- Do weight-bearing exercises that support bone health, such as walking, light jogging, or climbing stairs.
- Avoid smoking and excessive alcohol consumption.
- Take precautions at home to reduce the risk of falls (non-slip rugs, proper lighting).

---

### Scenario 7 – Reducing Fall Risk

---

**Question:**

As a nurse, what home safety and exercise recommendations would you give to reduce the risk of falls after menopause?

**Answer:**

- Organize walking areas at home; remove cables or rug edges that could cause tripping.
- Use non-slip mats in the bathroom and kitchen.
- Keep a light source easily accessible for when you get out of bed at night.
- Do balance exercises (tai chi, yoga) and leg-strengthening activities.
- Have regular eye examinations if you experience vision problems.

---

### Scenario 8 – Heart Health

---

**Question:**

As a nurse, what lifestyle changes would you recommend to a woman to protect cardiovascular health after menopause?

**Answer:**

- Do at least 150 minutes of moderate-intensity walking or exercise per week.
- Limit consumption of saturated fats, trans fats, and excess salt.
- Eat plenty of vegetables, fruits, whole grains, and healthy fats (such as olive oil).
- Quit smoking if you smoke.
- Have regular check-ups for blood pressure, blood sugar, and cholesterol.
- Practice relaxation techniques for stress management.

---

### Scenario 9 – Weight Management

---

**Question:**

As a nurse, what dietary and activity recommendations would you give to prevent weight gain during menopause?

**Answer:**

- Eat regular meals; skipping meals slows down your metabolism.
- Avoid sugary drinks and refined carbohydrates.
- Consume protein, fiber, and healthy fats in balance.
- Do at least 30 minutes of moderate-intensity exercise daily (walking, cycling).
- Try not to snack late at night.
- Pay attention to your sleep routine; insufficient sleep can increase weight gain.

---

### Scenario 10 – Sleep Problems

---

**Question:**

As a nurse, what sleep hygiene recommendations would you give to a woman who has difficulty falling asleep during menopause?

**Answer:**

- Relax by taking a warm shower before going to bed.
- Keep your bedroom cool, dark, and quiet.

- Avoid heavy meals and caffeine 2–3 hours before bedtime.
- Try to go to bed and wake up at the same time every day.
- Stop using electronic devices at least one hour before sleep.
- Practice relaxation exercises or meditation.

---

### Scenario 11 – Mood Swings

---

**Question:**

As a nurse, how would you support a woman experiencing irritability and emotional fluctuations during menopause?

**Answer:**

- Share your feelings with someone who will listen and understand you.
- Exercise regularly; endorphins help improve mood.
- Practice yoga, meditation, and breathing exercises to reduce stress.
- Express your feelings by keeping a diary.
- Seek psychological support when needed.

---

### Scenario 12 – HRT Counselling

---

**Question:**

As a nurse, what information would you provide to a woman considering Hormone Replacement Therapy (HRT)? Present both the benefits and risks in a balanced way.

**Answer:**

- HRT can help relieve symptoms such as hot flashes and vaginal dryness.
- It may reduce the risk of osteoporosis.
- Like any medication, it carries risks: it can increase the risk of breast cancer, blood clots, and stroke.
- Share your full medical history with your doctor before making a decision.
- The goal is to use the lowest effective dose for the shortest necessary duration.
- Regular follow-up with your doctor is essential.

---

### Scenario 13 – Herbal Supplements

---

**Question:**

As a nurse, what would you tell a woman considering herbal supplements for menopause symptoms? Include safety warnings.

**Answer:**

- Herbs such as soy, red clover, and black cohosh may be helpful for some women, but they do not have the same effect on everyone.
- Even though they are natural, herbal products can have side effects and interact with medications.
- If you are taking blood thinners, blood pressure medication, or hormone-related treatments, always consult your doctor first.
- Choose reliable brands and avoid products with unclear ingredients.
- Do not use them if you are pregnant or breastfeeding.

---

### Scenario 14 – Menopause Support at Work

---

**Question:**

As a nurse, what workplace adjustments would you recommend for a woman struggling with menopause symptoms?

**Answer:**

- Ensure good ventilation in the work environment.
- Allow flexible dress codes that include cotton and comfortable clothing.
- Provide cooling breaks for hot flashes.
- Offer shift changes or flexible working hours if necessary.
- Provide access to a quiet rest area.

---

### Scenario 15 – Family Support

---

**Question:**

As a nurse, what should a family pay attention to when communicating with and supporting a woman during menopause?

**Answer:**

- Be patient and understanding; recognize that emotional changes are related to hormonal processes.
- Do not belittle or dismiss her feelings.
- Provide support with household chores and daily responsibilities.
- Practice healthy lifestyle habits together (walking, healthy meals).
- Accompany her to medical check-ups when needed.