

# Development of an AI-powered Menopause Education Chatbot: Meno Chatbot

## 1. Introduction

Menopause is a universal life stage that can substantially affect women's physical, psychological, and social well-being [1,2]. The symptoms may significantly reduce quality of life [2]. With nearly one billion women expected to be in the menopausal age group globally, menopause is not only an individual health issue but also an important public health concern [2].

Despite this, many women still struggle to obtain reliable and understandable menopause information [3,4]. Existing information sources are often fragmented, inconsistent in quality, and sometimes influenced by misinformation or commercial interests [4,5]. Brief clinical consultations may not provide sufficient time for personalized education [4]. Clinical guidelines and medical terminology may be difficult for lay users to access, interpret, and apply in daily life without professional support [3,6]. These challenges create a clear need for an accessible, evidence-based educational tool that can support women in understanding menopause and making informed decisions [1,3].

## 2. Solution and Platform Vision

To address these problems, this project developed an AI-powered menopause education chatbot as an interactive, evidence-based tool that provides real-time health education in a conversational format (<https://menochat.lovable.app>). Users can select common menopause-related questions or type their own questions, and the chatbot provides clear, plain-language responses grounded in clinical guidance. (Figure 1.) Suggested follow-up questions are also provided to encourage continued learning. To support safe use, the chatbot includes boundary control for non-menopause-related questions and safety-oriented responses for risk situations. It is designed for education only and does not provide diagnosis, prescriptions, or individualized treatment decisions.

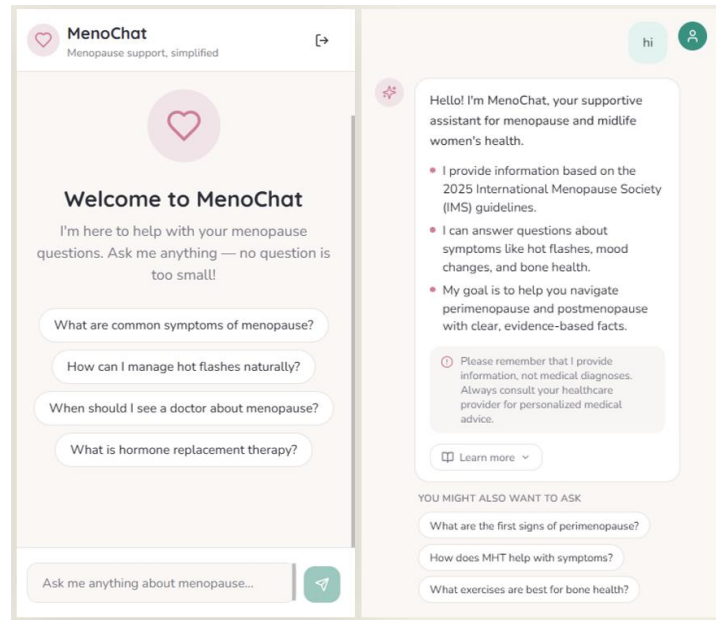


Figure 1 The chatbot interface

The project is designed using a People–Process–Technology framework (Figure 2.) to support safe and trustworthy healthcare education. Rather than replacing clinicians, the chatbot functions as a human-in-the-loop educational and care-navigation tool within the broader healthcare pathway. Clinical experts are involved in validating and updating the knowledge base, while high-risk situations may trigger referral or escalation to appropriate healthcare services.

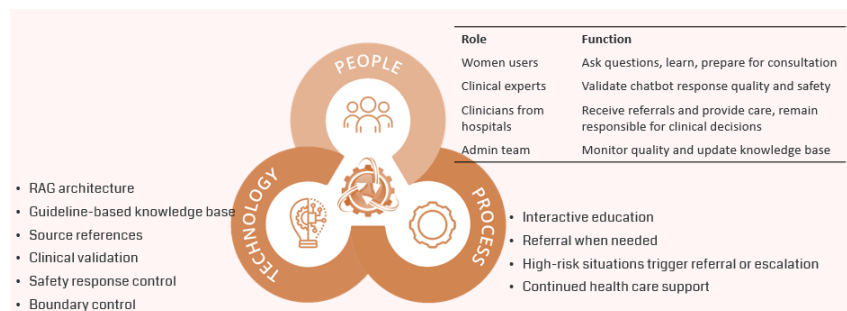


Figure 2. People–Process–Technology framework

Beyond the MVP, the long-term vision is to develop the chatbot into a broader women's health education and navigation platform. Menopause is selected as the early launch area because it has a clear target population, strong guideline-based evidence, and unmet education needs. After initial validation, the platform could expand to midlife women's health education, telehealth booking or clinic referral, and eventually an integrated women's health platform that supports education, assessment, referral, and follow-up support. This positions the chatbot not only as an information tool, but also as an entry point connecting women with reliable health services.

### 3. Technical Approach

The chatbot prototype uses Retrieval Augmented Generation (RAG) architecture. Rather than relying only on the internal knowledge of a large language model, the system first retrieves relevant content from a curated knowledge base and then generates responses grounded in that evidence [7,8]. This approach was selected to improve factual accuracy, reduce hallucination, and strengthen trustworthiness in health education contexts [7,8]. The knowledge base is built primarily from authoritative menopause guidance.

Personalization will be implemented. The chatbot may use basic user inputs, such as age range, menopause stage, and main concerns to generate customized responses. This is intended to improve the relevance of health education and user engagement.

The system prioritizes privacy protection by using consent-based collection, limiting personal information to what is necessary for education and personalization. To ensure data security, we retain only essential profile and topic-preference data, protected by encrypted storage, access control, and de-identified analytics in full compliance with data protection regulations.

### 5. User Validation

Initial validation was conducted with two female peer users. Each participant interacted with the chatbot prototype and then completed a short questionnaire containing Likert-scale items and open-ended questions. The early feedback was positive. Users found the chatbot easy to use and the answers understandable. They also viewed the conversational format as approachable and practical. Importantly, participants suggested that integration with healthcare services would further improve the tool's usefulness, indicating interest in future real-world applications.

The key takeaways from this initial validation are as follows: (1) the chatbot demonstrated high usability and good initial acceptance; (2) while currently focused on menopause, it has the potential to expand to broader women's health topics; and (3) integration with healthcare services could further enhance its real-world value.

### 6. Business Model

The proposed business model combines both B2C and B2B revenue pathways. On the B2C side, the chatbot adopts a freemium model, offering free basic access with limited usage while premium subscriptions (100 THB/month, with quarterly and annual discounts) provide unlimited access, personalization, saved history, and extended educational content. On the B2B side, hospitals, clinics, and telehealth platforms may pay monthly or annual licensing fees to use the chatbot as a patient education and engagement tool. Revenue may also be generated through telehealth integration fees, and referral or booking partnerships, where partners pay service fees for completed appointments initiated through the platform.

Its value proposition is to deliver cost-effective, evidence-based education, reduce clinician workload for routine questions, improve patient engagement, and function as a trusted digital entry point connecting users to healthcare services. Key customer segments include women aged 40–60, caregivers, healthcare providers, and institutional partners. This diversified model allows the startup to capture value not only from direct user payments but also across broader healthcare service pathways.

## 7. Go-To-Market Strategy

The go-to-market strategy will initially focus on trust-based user acquisition. First, we will collaborate with international hospitals and specialized women's clinics, where the chatbot can be introduced as a free patient education tool before or after consultation. This approach may help build credibility and encourage physician referrals. Second, targeted community outreach will be conducted through English-speaking expatriate networks, women's health groups, international community organizations, workplace wellness activities, and local health workshops to reach early adopters. Third, digital and social campaigns will share menopause education content on Facebook, Instagram, online communities, and messaging platforms, directing users to the chatbot through sign-up links or QR codes.

## Declaration of Generative AI Use

I acknowledge the use of generative AI tools (Google Gemini, ChatGPT) to assist in the preparation of this report.

## References

- [1] Hickey, M., LaCroix, A. Z., Doust, J., et al. (2024). An empowerment model for managing menopause. *The Lancet*, 403(10430), 947–957. [https://doi.org/10.1016/S0140-6736\(23\)02799-X](https://doi.org/10.1016/S0140-6736(23)02799-X)
- [2] Panay, N., Fenton, A., Hamoda, H., et al. (2025). International Menopause Society (IMS) recommendations and key messages on women's midlife health and menopause. *Climacteric*, 28(6), 634–656. <https://doi.org/10.1080/13697137.2025.2585487>
- [3] McCartney, M. (2022). Women need high quality, independent information about the menopause. *BMJ*, 379, o2931. <https://doi.org/10.1136/bmj.o2931>
- [4] Osborne, A. K., & Sillence, E. (2025). Accessing information on menopause transition and the role of digital health technologies: A narrative review. *Women & Health*, 65(6), 508–521. <https://doi.org/10.1080/03630242.2025.2523258>

- [5] The Lancet. (2024). Time for a balanced conversation about menopause. *The Lancet*, 403(10430), 877. [https://doi.org/10.1016/S0140-6736\(24\)00462-8](https://doi.org/10.1016/S0140-6736(24)00462-8)
- [6] Stanzel, K. A., Hammarberg, K., Nguyen, T., & Fisher, J. (2022). “They should come forward with the information”: Menopause-related health literacy and health care experiences among Vietnamese-born women in Melbourne, Australia. *Ethnicity & Health*, 27(3), 601–616. <https://doi.org/10.1080/13557858.2020.1740176>
- [7] Yigit, G., & Bayraktar, R. (2025). Chatbot development strategies: A review of current studies and applications. *Knowledge and Information Systems*, 67(9), 7319–7354. <https://doi.org/10.1007/s10115-025-02462-x>
- [8] Gao, Y., Xiong, Y., Gao, X., et al. (2024). Retrieval-augmented generation for large language models: A survey. *arXiv*. <https://doi.org/10.48550/arXiv.2312.10997>