weDecide: Clinical Tool for Shared Decision-Making for Treatment of Menopause Symptoms

Dr Nelly Bencomo, Durham University, Durham UK Dr Jennifer Horrocks, Bay Medical Group, Morecambe, UK, Mr Dylan Walton, Durham University, Durham UK Dr Huma Samin, Exeter University, UK

Abstract details:

Background

Menopause care is deeply personal and often involves weighing potential benefits, risks, and individual preferences. While clinical guidelines and specialist input offer structure, women navigating perimenopause increasingly seek personalised, transparent, and participatory approaches. Machine Learning (ML) and Artificial Intelligence (AI) offer promising opportunities to support personalised and shared decision-making (PSDM) by combining clinical insights with individual values and priorities.

Objectives

1. To propose an AI/ML-based clinical tool that supports PSDM for menopause treatment.

2. To ensure that the tool integrates both expert clinical criteria and the preferences of the woman experiencing symptoms.

Methods

Step 1: Exploration of AI/ML Techniques for Preference-Based Treatment Recommendations.

We conducted an initial study evaluating AI methods to support PSDM. Techniques prioritising explainability were selected, including logistic regression, decision trees, linear support vector machines, and multi-criteria decision-making (MCDM) methods.

Step 2: Design and Development of the weDecide Tool Prototype.

• Part 1: A recommender system that suggests treatments based on patients with similar symptoms. Emphasis was placed on explainability, enabling both patients and clinicians to understand the rationale behind recommendations.

• Part 2: An MCDM module allowing patients and clinicians to express preferences and explore treatment options together, supporting collaborative discussion.

The tool uses both a synthetic dataset and anonymised data derived from audits of GP electronic health records. Patient privacy is strictly maintained through data masking techniques.

Results

Several proposed models achieved acceptable accuracy (75%+). The MCDM component was successfully integrated, providing recommendations aligned with both

clinical reasoning and patient priorities. Outputs are presented in a user-friendly, interpretable format to support meaningful dialogue.

Conclusion

This research highlights how AI/ML can help enhance menopause care by supporting more personalised, explainable, and collaborative decision-making. By combining clinical expertise, patient preferences, and privacy-protected audit data, tools like weDecide can empower women and clinicians to make more informed treatment choices. Future work will focus on expanding real-world datasets and refining the tool's interface and communication strategies.

website: https://wedecide.webspace.durham.ac.uk/

Funding sources: EPSRC IAA, Durham University, UK Reference Project EPSRC IAA OCT23

Citation on deposit:



Bencomo, N., Horrocks, J., Walton, D., & Samin,H. (2025, June). weDecide: Clinical Tool forShared Decision-Making for Treatment ofMenopause Symptoms. Presented at BMS Annual

Scientific Conference 2025, Chesford Grange, Kenilworth, UK

For final citation and metadata, visit Durham Research Online URL:

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