

Personalized and Interactive Education in Migraine Using Artificial Intelligence

**Fabio Rinaldi and Oscar William Lithgow Serrano and Andrea Franchini
Chiara Zecca and Giulia Mallucci and Alberto Cordella**
fabio@idsia.ch

Abstract

Migraine is a prevalent neurological condition that affects approximately 1 in 7 individuals worldwide. It places a substantial burden on both individuals and societies, encompassing healthcare utilization, medication expenses, physical and psychological disability, diminished quality of life, and decreased productivity.

Efforts to enhance public awareness regarding migraine, its influence on daily life, and the available treatment alternatives are frequently insufficient due to restricted resources or inadequate emphasis. Furthermore, educational initiatives must be tailored to varying levels of education, cultural backgrounds, and languages, thereby guaranteeing the dissemination of information across a wider spectrum of individuals.

The project aims to develop an AI powered educational platform for personalized migraine education and assess its effectiveness and safety through a randomized clinical trial. Our project includes two parts. In part I, a platform utilizing Large Language Models (LLMs) has been tailored to generate personalized content, answer queries, and provide support on migraine. Two approaches (A and B) are being considered.

Approach A involves adapting a pre trained commercial LLM to the project goals using a combination of prompt engineering approaches, while approach B will further involve fine tuning an open source LLM. Approach A is currently under exploration due to its feasibility within the project's timeframe. However, it has limitations in control and data privacy. After initial testing, approach B will be pursued for optimized information control and customization.

Part II involves a 6 month randomized, clinical trial with 200 migraine patients. Group 1 will use the AI platform, and Group 2 will receive standard education. Learning effectiveness, clinical metrics, and adverse events will be compared between groups. The project's innovation lies in its unique AI driven education approach, contributing to fill a gap in migraine education and ultimately improve migraine patients' quality of life and reduce migraine related costs.