Self-care Empowerment: Leveraging Conversational User Interfaces to Support Dietary Behavior Monitoring and Reflection

Yunjie Liu*, Eindhoven University of Technology, The Netherlands, y.liu12@tue.nl
W. F. Goevaerts, Eindhoven University of Technology, The Netherlands
N.C.C.W. Tenbült - Van Limpt, Maxima Medical Centre, The Netherlands
Max V. Birk, Eindhoven University of Technology, The Netherlands
Hareld M.C. Kemps, Maxima Medical Centre, The Netherlands
Yuan Lu, Eindhoven University of Technology, The Netherlands

I am a PhD student at Eindhoven University of technology under the supervision of Yuan Lu, Max V. Birk and Hareld Kemps. My research topic is empowering self-management skills for cardiovascular patients regarding their dietary behavior. I want to participate in this workshop to bring my knowledge in dietary self-monitoring and intervention through data-driven conversational user interfaces into the discussion.

Dietary intervention, including dietary counseling and education [1], has shown to be effective for the secondary prevention of cardiovascular disease (CVD). Hence, dietary interventions constitute a central component of cardiac rehabilitation (CR) [2]. Despite the evidence that dietary behavior is a major risk factor for the development and progression of CVD [3], patient adherence to dietary guidelines remains low [1], and healthcare provider-mediated dietary interventions remain underutilized in clinical practice [4]. With the rise of mHealth and uHealth technologies, digitalized dietary interventions are increasingly applied to support self-management of dietary behavior through food logging interfaces and personalized recommendations [5]. However, the time-consuming inconvenience of manual food logging results in low adherence and inadequate data quality [6]. Conversational agents, i.e., chatbots, are promising tools to improve the self-tracking experience by proactively motivating self-monitoring [7], alleviating the tracking burden [8], and promoting self-care [9].

In an attempt to enhance self-care engagement and empower self-management skills for cardiovascular patients regarding their dietary behavior, we created a decision-tree based chatbot to facilitate dietary self-monitoring and promote self-reflection on their food choices [10]. The chatbot tracked the dietary intake on the food group level. It linked the collected data to the Dutch Nutrition Database (NEVO) and shared it with healthcare professionals via the dashboard to support further investigation and decision-making.

The chatbot was integrated into a lifestyle-monitoring platform in a one-year clinical trial to monitor the lifestyle behaviors of patients who were scheduled for or recently have undergone cardiac interventions. In this prospective observational trial, participants were instructed to self-monitor their lifestyle behaviors via the conversational user interfaces and with a wrist-worn activity tracker, following a pre-defined measurement schedule. Participant recruitment started in December 2021. Till February 2023, 66 out of 100 patients were onboarded. This study's primary objective is adherence to self-monitoring with the lifestyle monitoring system.

For further research, we are interested in employing a data-driven approach to facilitate goal-setting and self-reflection, in order to promote healthy dietary behaviors.

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