

## Development and Feasibility of a Text Messaging and Interactive Voice Response Intervention for Low-Income, Diverse Adults with Type 2 Diabetes Mellitus

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### Abstract

Low-income, racial/ethnic minorities are often nonadherent to diabetes medications, have uncontrolled glycemia, and have high rates of diabetes-related morbidity. Cell phones provide a viable modality to support medication adherence, but few cell phone-based interventions have been designed for low-income persons, a population with more feature phone penetration than smartphone penetration. In an effort to reach the broadest range of patients, we leveraged the voice and text messaging capabilities shared by all cell phones to design the MESSAGING for Diabetes intervention. We specifically advanced and adapted an existing tailored text messaging system to include interactive voice response functionality and support the medication adherence barriers of low-income, diverse adults with type 2 diabetes mellitus. We report on the design process and feasibility testing results (i.e., technical use patterns and subjective user experiences) from patients from the target population who used the intervention in one of three user-centered design iterations. The types of challenges encountered in design were related to providing text message content with valued information and support that engages patients. The design process also highlighted the value of obtaining mixed methods data to provide insight into legitimate versus illegitimate missing data, patterns of use, and subjective user experiences. The iterative testing process and results outlined here provide a potential template for other teams seeking to design technology-based self-care support solutions for comparable patient populations.

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**Abbreviations:** (A1C) glycosylated hemoglobin A1c, (IVR) interactive voice response, (MED) MESSAGING for Diabetes, (RA) research assistant, (SMS) short messaging service, (T2DM) type 2 diabetes mellitus

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