

Testing of a Music-based Application Prototype to Improve Insomnia Symptoms in Persons Living with Dementia

Darina V. Petrovsky, PhD, RN¹, Justine Sefcik, PhD, RN², Osborn Owusu Ansah, BSN, RN¹, Miranda V. McPhillips, PhD, RN³, Cherie Barnes MS, RD, LDN¹, Nancy A Hodgson, PhD, RN, FAAN⁴, Bei Wu, PhD, FAAN⁵.

¹Duke University School of Nursing, ²Drexel University, ³Villanova University, ⁴University of Pennsylvania, ⁵New York University Shanghai

Introduction

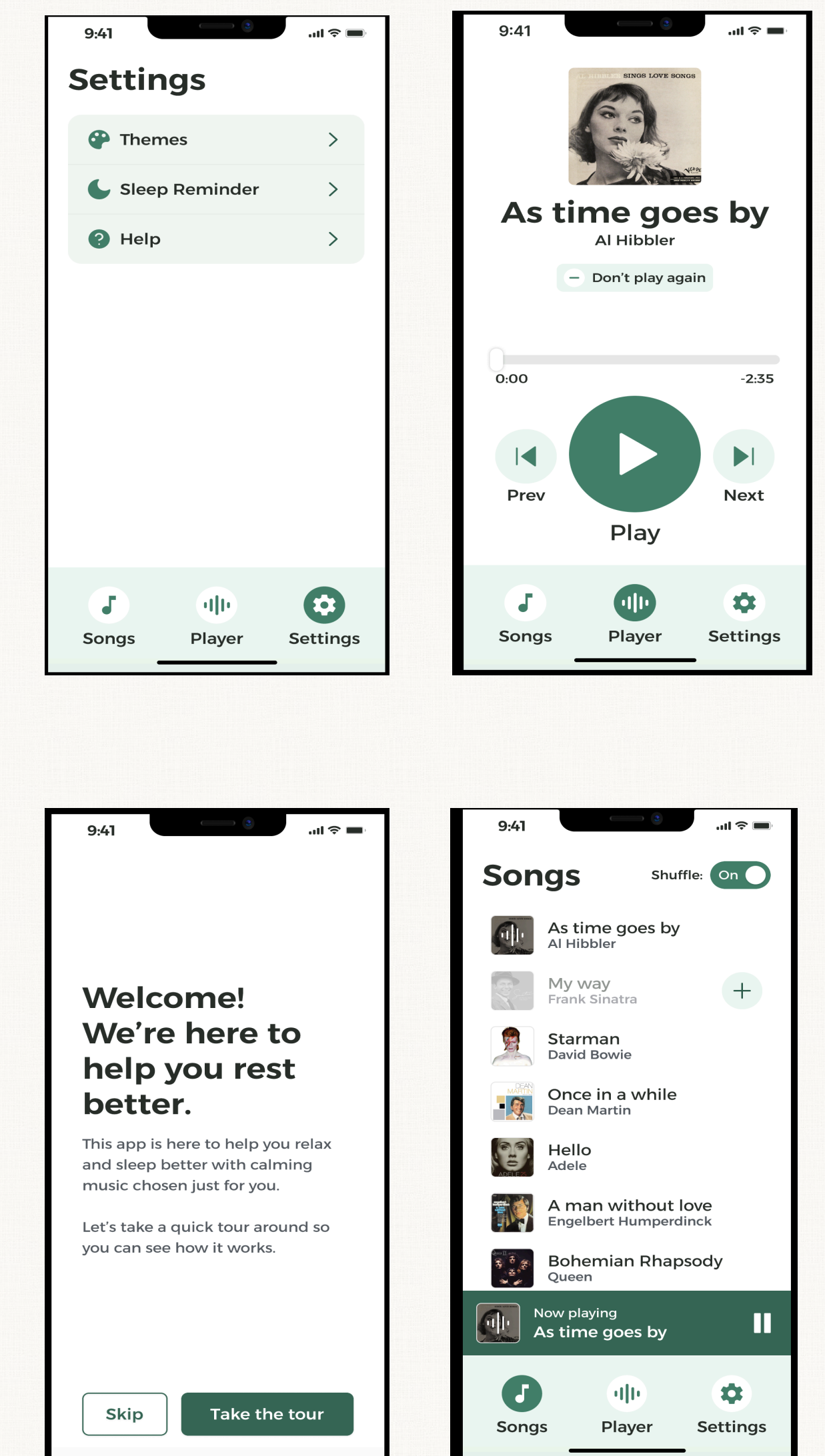
- Most persons living with dementia (PLWD) experience insomnia symptoms including difficulty falling asleep or staying asleep.
- Music interventions show promise for addressing insomnia in PLWD, as musical memory often remains intact despite cognitive decline and can be personalized to individuals.
- The purpose of this study was to test the prototype features of a mobile application “Calming Music Personalized for Sleep Enhancement in Persons Living with Dementia (CoMPoSER)”.

Methods

- We piloted CoMPoSER using a sequential rapid-cycle prototyping approach for 7 days with 10 dyads of PLWD and their caregivers.
- At follow-up, we assessed usability (Post Study System Usability Questionnaire, Likert Scale 1-5), feasibility (Feasibility of Intervention Measure, Likert Scale 1-5), and appropriateness (Intervention Appropriateness Measure, Likert Scale 1-6).
- Baseline and follow-up interviews were analyzed using a rapid qualitative analysis technique.

Results

- PLWD: mean age 82 years, SD=10; range 65-97. 60% women.
- Caregiver: mean age 72.4 years, SD=4.2; range 69-81. 70% women.
- **Usability:** High (M = 4.6, SD = 0.5); all dyads (100%) rated usability as neutral or higher.
- **Feasibility:** Strong (M = 4.4, SD = 0.7); all dyads (100%) reported neutral or higher feasibility.
- **Appropriateness:** Favorable (M = 5.1, SD = 1.9); most dyads (80%) rated appropriateness as neutral or higher.
- Follow-up surveys and interviews revealed functional issues, including the start/stop/skip controls and sound inconsistencies, which prompted iterative app modifications.
- Dyads provided feedback on the music selection process and offered suggestions to optimize future personalization.



Implications

- High usability and feasibility ratings support the potential for broader adoption of CoMPoSER in dementia care settings.
- User-centered, iterative design may enhance usability and acceptability of sleep-support technologies for persons living with dementia.
- Future work will examine the app’s efficacy in improving sleep outcomes and integration into daily caregiving routines.

Funding Statement

This work is supported by the National Institute on Aging of the National Institutes of Health under grant number [K23AG073618] and the Alzheimer’s Association grant number [23AARG-1019200].

