“Alexa, I’m in pain!”: Development of a Voice Interface to Support Mindfulness Practice for Individuals with Chronic Pain

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Introduction

- Chronic pain is the leading cause of disability in the United States [3].
- 5 to 8 million Americans are prescribed opioids for long-term pain management [2].
- Mindfulness-Based Stress Reduction (MBSR) is an 8-week evidence-based program that has been shown to improve distress tolerance [1] and reduce negative health outcomes [4].
- However, MBSR is limited by low compliance with mindfulness practice outside of the classroom.

Research Goal

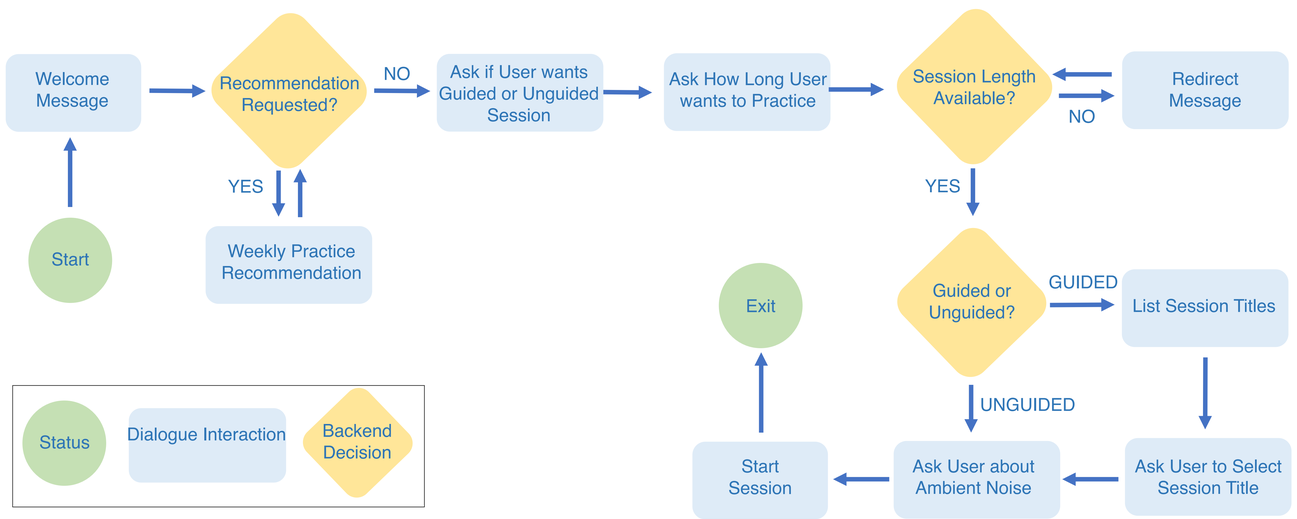
- We developed a voice interface to support MBSR **home practice** and improve participant **adherence**.
- We adapted content from the MBSR curriculum to be conducive for delivery via a **voice-driven**, **non-visual** interface.
- The goal of the current study is to assess the **feasibility**, **acceptability**, and **usability** of our prototype among both **facilitators** and **individuals with chronic pain**.

Methods

- 60-minute semi-structured interviews with 10 mindfulness facilitators (F).
- 30-day pilot study and follow-up interviews with 16 individuals with chronic pain (P).
- Analyzed interview transcripts using deductive thematic analysis.

“Scan the QR code to see a demo!”

Dialogue Structure to Support MBSR Practices



Theme	Description	Example Quote
Improving Accessibility	Voice interaction was seen as more accessible than other technological modalities.	“For people who are in very severe pain and may be bedridden, maybe they’re not able to lift their arms or wiggle their fingers [. . .] yet they can usually open their mouth and then Alexa can respond with this skill” (F5).
Unique Affordances of Voice Interactions	Participants liked the social aspect of verbally interacting with the prototype.	“I think that just hearing her talk and being able to talk and [have] somebody [who] talks back when you speak out loud, I think that that’s gonna be really beneficial for people trying to get through the program” (F5)
Support for In-The-Moment Practices	Participants appreciated the ability to request a practice whenever they wanted.	“[If] somebody wants to mediate, they can meditate any time, day or night, they have the Alexa there” (F9).
Integrating MBSR Practices into Daily Life	Participants found that using the voice interface helped them integrate MBSR skills into their daily life.	“I found that I did actually incorporate [the practices] into my daily life, which has really helped over the past month! I’ve noticed that my pain has been less than it was at the beginning of the month.” (P12)
Alternative to Prescription Pain Medication	Participants viewed the voice interface as a promising alternative to prescription pain medication.	“I see this as something I’ll continue to use as another option for me because I don’t have a lot of non-medication options that I use.” (P6)

Table 1. *Findings from Thematic Analysis of Interview Data*

Findings

- Voice interaction poses **unique affordances** in terms of how easily practices could be accessed as compared with other technologies, particularly for individuals with chronic pain.
- Participants noted how voice interaction can lead to perceived **socially engagement**.
- Participants felt more motivated to engage with **in-the-moment practices** due to the ubiquity of the Amazon Alexa platform.
- The voice interface was effective in supporting the **integration of MBSR practice** into participants’ daily lives.
- Participants viewed the voice interface as a **non-pharmacological option** for chronic pain management.

Conclusion

- Voice-driven technologies (like Amazon Alexa) can support MBSR home practice.
- Voice interaction is particularly useful for individuals living with chronic pain given the **ease of use** and **reduced physical burden**.
- Future work should explore the impact of voice interfaces on the **efficacy** of MBSR.

References

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