

OPP: DEMENTIA & TECHNOLOGY

Exploring the potential of an interactive soundscape tabletop in dementia care: Insights from collaborative development

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Purpose Music is widely recognized for its therapeutic benefits in dementia care, evoking emotional responses, triggering memories and promoting social interaction (Van der Steen 2018). However, the potential of everyday sounds, such as familiar household or natural sounds, remains largely unexplored in care practice. Research suggests that sounds, such as those found in familiar household or natural environments, can elicit positive responses in people living with dementia (Houben et al. 2019). This paper presents the results of a collaborative effort between researchers, caregivers and people living with dementia to develop and propose a sustainable sound-based technological solution for dementia care, focusing on implementation aspects resulting from the collaborative development. Through three years of intensive collaboration, involving practitioners and individuals living with dementia, we developed the 'interactive soundscape tabletop,' designed to offer immersive sound environments for reminiscence care and well-being (Held et al. 2023). **Method** Following a participatory design methodology and iterative development process, researchers and caregivers from three care facilities worked closely together to co-create an interactive soundscape device tailored to the specific needs of people living with dementia. Key stakeholders, including people living with dementia, caregivers and technology developers, were actively involved in all stages of the project, from initial concept development to final implementation. Through extensive co-design sessions, field testing and a final evaluation within these care facilities, the solution was rigorously tested to assess its potential for long-term viability and effectiveness in supporting sound-based dementia care practices. **Results & Discussion** The collaborative development process has generated valuable insights into the integration of the soundscape tabletop within dementia care. By combining researchers' expertise with caregivers' practical knowledge, we've crafted an interactive solution to facilitate the use of sounds in care practices. Insights from our ongoing evaluation underscore the importance of continuous collaboration and iterative refinement to maintain the relevance and effectiveness of technological solutions in dementia care. Our study sheds light on practical implications regarding the incorporation of the soundscape tabletop into existing caregiving routines. This encompasses: 1) User interaction aspects, including the potential for autonomous interaction and the importance of respecting individual preferences for specific sounds, 2) sound-based interventions tailored to different engagement levels during both group and individual activities, and 3) the caregiver's pivotal role in facilitating system usage. These findings offer actionable recommendations and practical guidance for researchers, practitioners, and caregivers for optimizing the design and implementation of digital sound-based interventions in dementia care. The digital use of sounds represents a promising approach to complement existing music-based interventions for people living with dementia in long-term residential and day care settings. They also offer family caregivers new ways to engage and stimulate their loved ones at home. In addition, these interventions could be used in therapeutic settings to incorporate sound-based activities into the treatment of people with disabilities, depression or other forms of cognitive impairment. Ongoing research and development efforts are essential, along with the development of specific usage concepts and training materials to ensure sustainable integration of the solution into different care settings, ultimately improving the well-being of people with cognitive impairment.

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Figure 1. Overview of the interactive soundscape tabletop