Challenges of Trustable AI and Added-Value on Health
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Evaluating mHealth Design for People with Dementia: Preliminary Results

Thomas ENGELSMA[a,b,1], Laila R. RIPPIN[a,b], Monique W. JASPERS[a,b] and Linda W. PEUTE[a,b]
[a] *Center for Human Factors Engineering of Health Information Technology*
[b] *Department of Medical Informatics, Amsterdam Public Health research institute, Amsterdam UMC, location AMC, Amsterdam, The Netherlands*

Abstract. The availability of mHealth for people with dementia is increasing. Various mHealth design guidelines for this population have been proposed. In this study, we developed a binary checklist with evaluation statements to assess the implementation of twenty design suggestions in seven currently available mHealth apps for people with dementia. Between 17%-65% of the evaluation statements in the checklist were implemented in these apps. Not all statements were considered applicable for each assessed mHealth app, which resulted in dividing the criteria in two groups as either key evaluation statements or optional evaluation statements. In future work we want to augment this checklist to contribute to the future design of mHealth for people with dementia.

Keywords. Design guidelines, mHealth, Dementia, Evaluation

1. Introduction

A rising number of mobile health (mHealth) apps are available for people with dementia (PwD) and can be a valuable addition to, for example, activities of daily living. However, their design does not always match the needs and capabilities of PwD. To contribute to the development of mHealth design guidelines for PwD, a previous scoping review identified twenty, expert- and evidence based, dementia-related design suggestions aiming to improve mHealth usability for PwD [1]. However, little is known about the actual implementation of these design suggestions in current mHealth apps available to PwD. Therefore, this short paper presents an assessment of currently available mHealth apps for PwD on these previously identified design suggestions. Ultimately, we aim to develop mHealth design criteria for PwD.

2. Methods

The twenty design suggestions from the scoping review were first reformulated into evaluation statements. The following structured sentence was applied to ensure

[1] Corresponding Author, Thomas Engelsma, Amsterdam UMC, University of Amsterdam, Department of Medical Informatics, Center for Human Factors Engineering of Health Information Technology, Meibergdreef 9, Amsterdam, the Netherlands; E-mail: t.engelsma@amsterdamumc.nl

consistency: 'The app' followed by either 'allows', 'has', 'provides' or 'supports', and finalized with the design suggestion. Next, a binary scoring checklist was developed. Each mHealth app was assessed with the evaluation statements and assigned 1 (implemented), 0 (not implemented) or "N/A" (statement not applicable for the evaluated app). Afterwards, percentages were calculated by dividing the number of implemented statements by the total applicable statements. The iOS App store was searched with the following topics: dementia, memory, Alzheimer, screening, tracking, and cognition. Results were screened and selected if they complied with the following criteria: (1) app has a focus on PwD or those with cognitive impairments and (2) free to download without in-app purchases.

3. Results

Reformulating the design suggestions led to twenty-one evaluation statements related to cognitive barriers (n=6), physical ability barriers (n=1), perception barriers (n=6), and frame of mind barriers (n=8). Seven mHealth apps for PwD were selected for evaluation of which two aim to support cognitive training, four to facilitate daily activities, and one to improve awareness. Assessment of these apps showed that out of the twenty-one statements eleven were considered key evaluation statements applicable to all PwD apps studied and ten statements were optional and depended on the functionalities of a mHealth app. In total between 17 and 19 statements were applicable per included mHealth app leading to an assessment score that ranged between 17% - 65%. One statement scored "N/A" for all seven apps.

4. Discussion & Conclusion

Twenty out of the 21 evaluation statements were found to be applicable for the assessment of mHealth apps for people with dementia. In general, the evaluated apps scored poor on the implementation of available design suggestions. The cause may be that some design suggestions are customizable in the system settings of the mobile device that runs the app (e.g. screen brightness) rather than being implemented as an in-app setting. Further development of mHealth design criteria for PwD should be tuned to specific mHealth functionalities while taking into account system versus in-app settings.

References

[1] Engelsma T, Jaspers MWM, Peute LW. Considerate mHealth design for older adults with Alzheimer's disease and related dementias (ADRD): A scoping review on usability barriers and design suggestions. Int J Med Inform. 2021 Aug;152:104494.