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Usability Evaluation of a Web-Based Remote Patient Monitoring Application: An Ongoing Study

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Abstract. This study aims to discover problems and user experiences in a new released version of Sleepiz web application using heuristic evaluation and eye-tracking retrospective think-aloud performed by domain experts and end users. The web application is designed to support healthcare professionals in decision-making and monitoring of elderly people diagnosed with chronic respiratory diseases. Identification of usability problems and user experiences might contribute to improve the platform and will be reported to the developers.

Keywords. Telemedicine, Remote monitoring, clinical decision support systems, health data

1. Introduction

Chronic Respiratory Disorder Prediction and Management through Contactless Remote Nocturnal Monitoring (ChroNoct) is a European research project that aims to develop a platform that monitors nocturnal vital health parameters such as respiration rate, heart rate, sleep duration, and body movement among elderly for early prediction, management, and diagnosis of chronic respiratory diseases. A radar-based device, Sleepiz One^{+} placed at the bedside table measures health parameters during sleep which are send to Sleepiz's web application monitored by healthcare professionals [1]. A user-friendly web application is essential for successful implementation, which involves effective prediction of exacerbations to initiate earlier treatment and minimize the number of hospitalizations. The aim of the study is to conduct a usability evaluation of a new version of Sleepiz's web application that will be released in April. The goal will be to understand all user requirements and issues to further improve the web application.

2. Methods

The usability evaluation is divided into two parts as illustrated in Figure 1. Part I) Heuristic evaluation is performed independently by 5 human computer interaction

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experts with domain knowledge by testing the user interface up against Nielsen's ten heuristics [2]. Part II) Eye-tracking retrospective think-aloud is conducted by 5 healthcare professionals which will be handed scenarios that cover most of the users' tasks (ex. login, view health parameters). The healthcare professionals will be instructed to "think aloud" to verbalize their thoughts and actions of how they experience interacting with the web application while their eye movements are measured. Each session will be performed in a laboratory located at Aalborg University between May and June 2024.

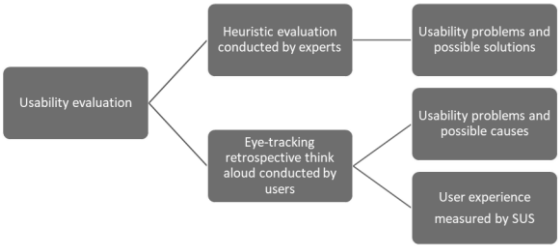

Figure 1. Study design overview

3. Results

A pretest questionnaire on demographics and technology experience will be shared with participants. Data from heuristic evaluation will include a list of usability violations and their severity along with suggested solutions. Data from eye-tracking retrospective think-aloud will contain, task performance metrics (ex. task completion rate, critical errors), eye-tracking metrics (ex. fixation, saccades), and qualitative retrospective think-aloud verbalizations. A post-test questionnaire, System Usability Scale will be used to obtain the perceived usability of the web application.

4. Discussion and Conclusions

The study seeks to identify heuristic violations and to gain in-dept knowledge of the usability issues related to end-users' interaction through Sleepiz's web-application. Identification of problems and recommended solutions will be presented to developers and may contribute to improve the ease of use of the platform. Combining different usability methods may contribute to a thorough evaluation by revealing usability problems through different perspectives.

References

[1] Chronoct [internet]. Brussels: AAL Association [date unknown]; [cited 2024 March 8]. Available from: https://www.aal-europe.eu/projects/chronoct/
[2] Miller K, Capan M, Weldon D et al. The design of decisions: Matching clinical decision support recommendations to Nielsen's design heuristics. Int. J Med Inform. 2019 sept. 1; 117: 19-25