dHealth 2023
B. Pfeifer et al. (Eds.)

© 2023 The authors, AIT Austrian Institute of Technology and IOS Press.
This article is published online with Open Access by IOS Press and distributed under the terms of the Creative Commons Attribution Non-Commercial License 4.0 (CC BY-NC 4.0).
doi:10.3233/SHTI230013

Fading Fatigue – A Self-Management App for Supporting Long-COVID Patients with Fatigue

Daniel S. SCHMID[a,1], Denis S. MOSER[a,1] and Kerstin DENECKE[a,2]
[a] *Bern University of Applied Sciences, Bern, Switzerland*

Abstract. Fatigue is the most prevalent Long-COVID symptom. Individuals who are affected have to learn to organize and manage daily activities according to the subjectively perceived energy reserves. Our objective was to develop an application, Fading Fatigue, that supports patients in their energy management, in particular after an initial therapy guided by health professionals. Fading Fatigue was developed in an iterative approach and implemented as a client-server application. Interviews and a literature search were conducted to identify limitations and challenges of the current treatment. Fading Fatigue offers several tools for energy management: a daily energy planner, a documentation aid for well-being and a progress view. Future work should study usability. Inclusion of additional features increasing the adherence such as providing feedback could be considered.

Keywords. Fatigue, mobile health, COVID-19, self-management

1. Introduction

Individuals diagnosed with Long-COVID experience several signs and symptoms (e.g. chest pain, fatigue, dyspnea, cough, cognitive and memory impairment [1]). People who are affected by fatigue go through periods of intense tiredness and have trouble handling stress; main symptoms include excessive physical and mental exhaustion. As a result, routine tasks cannot be carried out and those affected limit their activities out of prudence due to a potential fear of tiredness. The social and professional lives of the patients are limited, and they have a lower quality of life [2]. The current treatment consists of teaching patients the importance of leading an active lifestyle to regain some of their initial resilience. Patients learn to organize and manage daily activities according to the subjectively perceived energy reserves. The daily (energy) load is kept as close as feasible to the person's stress threshold in this type of energy management. By doing this, it is possible to stop the chronification of weariness, which is encouraged by unevenly distributed activity levels [2]. So far, no mobile health solution is available to support patients in this challenging task of self-managing fatigue for Long-COVID patients. The App Untire is a mobile application designed for cancer patients with tumor-related fatigue [3]. However, a study concluded that Untire could be used by patients with Long-COVID only “with certain restrictions” [3]. In this work, we develop an application,

[1] Contributed equally
[2] Corresponding Author: Kerstin Denecke, Bern University of Applied Sciences, Quellgasse 21, 2502 Biel, Switzerland, E-Mail: kerstin.denecke@bfh.ch

Fading Fatigue, designed for patients with Long-COVID that supports them in their energy management, in particular after an initial therapy guided by health professionals.

2. Methods and Results

We developed our concept and prototype by a requirement analysis (literature search and expert interviews), concept development with mockup generation, expert feedback and implementation of the prototype. Since treatment guidelines for this medical condition are still missing, we conducted interviews with health professionals and developed a clinical path based on this input. We learned that tools for diagnosis and monitoring are still missing and that Fading Fatigue must support patients at the time after discharge, but also the medical staff who are administering the treatment.

The Fading Fatigue application is aimed at patients who suffer from fatigue due to Long-COVID (ICD-10 U09.9!: Post-COVID-19 condition) and have been discharged from a rehabilitation clinic to the personal home. It provides documentation tools that can be used for planning and for reflection of the subjectively perceived energy. The daily planner helps patients to organize their personal activities according to their subjectively perceived energy reserves. In addition, information on physical and mental well-being and sleep quality can be documented. The reflection aid is offered in a statistics-like display and allows patients to independently recognize correlations between activities, energy and well-being. Specifically, the visualization tool allows to compare documented activities and subjective experiences (energy and well-being). This comparison can be used by patients as a basis for reflection for future decision making in activity planning. The application is developed as a client-server application.

3. Conclusions

In this work, we presented an application supporting energy management for patients with Long-COVID considering the peculiarities of the treatment of patients with this disease. Based on the results from our literature search and the interviews, we found out that patient reported outcome measures (PROMs) should be integrated in Fading Fatigue since this would allow health professionals to monitor the treatment progress. Currently, perceptions of physical and mental well-being as well as information on sleep behavior is collected. This feature could be extended by integrating other data items or questionnaires into the application. Additionally, inclusion of gamification elements could support adherence. A field study with patients will ensure the usability and effectiveness of the application.

References

[1] A.L. Cabrera Martimbianco, R.L. Pacheco, Â.M. Bagattini, R. Riera. Frequency, signs and symptoms, and criteria adopted for long COVID-19: A systematic review. *Int J Clin Pract*. 2021 Oct;75(10):e14357

[2] T.A. Kuut, F. Müller, A. Aldenkamp, et al. A randomised controlled trial testing the efficacy of Fit after COVID, a cognitive behavioural therapy targeting severe post-infectious fatigue following COVID-19 (ReCOVer): study protocol. *Trials.* 2. Dezember 2021;22(1):867.

[3] R. Ruckser-Scherb, J. Gassner, C. Himmelbauer. Fostering Fatigue-Management in People with Post-Acute COVID-19 Syndrome – Experiences with the "Untire" App. *dHealth* 2022. 2022;47–51.