

Abstract

This diploma thesis deals with the adherence to inhaled treatment, its measurement, telemedicine and telerehabilitation and the possible use of the CF Hero mobile app in paediatric patients with cystic fibrosis. In the theoretical part, it presents knowledge about cystic fibrosis, adherence to treatment in patients with cystic fibrosis and possibilities of its measurement, telemedicine and telerehabilitation. The practical part describes the CF Hero mobile app, which has been the target of measurements on several patients. At the same time, a questionnaire was developed focusing on satisfaction with the use of this mobile application.

Methods: The practical part was conducted as a multicentre prospective cross-over study investigating the effect of the CF Hero mobile app on adherence to inhaled treatment, respiratory quality of life and chest excursion. The evaluation was conducted over a 6-month period, with the primary objective being to measure the amount of exhaled solution relative to the prescribed amount. Simultaneously, each patient underwent 3 identical examinations. These examinations included spirometric testing (FEV1, FVC, MEF50), measurement of chest excursion (axillary, mesosternal, xiphoid) and quality of life assessment using the CFQ-R questionnaire. It also included measurement of adherence to the use of the mobile app itself and a questionnaire with feedback on the use of the mobile app for children and parents.

Results: A total of 23 children with a mean age of 12.4 ± 3.3 years participated and completed the study. Mean adherence to inhaled treatment was 81 ± 13 % in the phase without the CF Hero mobile app and 85 ± 16 % in the phase when it was enabled. However, the mean difference of 4 % between phases was statistically insignificant. We observed significant changes in lung function scores predominantly relative to baseline regardless of CF Hero mobile app use, but no longer between phases (with and without the mobile app). We observed the same phenomenon when measuring chest excursion or quality of life using the CFQ-R questionnaire. When comparing the two phases, we obtained only statistically insignificant differences.

Conclusion: In this paper, the CF Hero mobile app for children with CF is presented. The effect of this mobile app was objectified by the difference in adherence values during use and non-use, as well as chest excursion, pulmonary function FEV1, FVC and MEF50, and the CFQ-R questionnaire. None of the values reached statistical significance. To improve efficiency, it is important to modify the app based on feedback from users and their parents, which we received after the completion of the study and found to be very useful.