

## **A mobile application for heart failure management**

**Background** Self-management in chronic disease such as congestive heart failure (CHF) is increasingly seen as critical for the patients' health and quality of life. It has been shown that an appropriate and consistent self-management helps maintain clinical stability, and reduces mortality risk and hospital admission. However, it requires a big commitment from patients as they are obliged to monitor their symptoms and physiological parameters such as blood pressure, and – even more importantly – adhere to their medication, diet and exercise regimes, etc. Mobile health technologies have emerged as a way to simplify this task and actively engage patients in self-management. Several mobile applications have recently been developed for this purpose. Their main functionality is to track the information relevant for the patients' health, while the guidance they provide is general and usually relatively simple. In addition, as far we know, no existing application includes all topics relevant for CHF management; most of them focus only on one or two problems (e.g. medication adherence, physical activity, etc.).

**Purpose** The main purpose of this study was to build a mobile application for the self-management of CHF, which includes all the relevant topics and provides an appropriate guidance to the patients.

**Methods** A systematic review was conducted regarding models predicting mortality/hospitalization and quality of life in CHF patients. This information was synthesized with existing guidelines for the treatment of CHF and expert opinions, and translated into decision models and content to be administered through a mobile application.

**Results** Using the described method we were able to recognize five important topics concerning self-management for CHF patients, which are also included in our application: physical activity, medication, nutrition, monitoring of symptoms and physiological parameters, and environment management. The application has access to the patients' health record, is connected to a monitoring wristband, and keeps a record of the user's past actions. The guidance it provides is thus personalized based on the patient's data. For example, the exercise programme depends on the patient's physical capacity and current heart rate, while the nutrition education is adapted to the patient's comorbidities (diabetes etc.) and focuses on topics the patient has difficulties with.

**Conclusion** Although there are several mobile applications for CHF management on the market, none provide comprehensive guidance to all relevant self-management topics identified through the literature review, and they do not offer a significant degree of personalisation. With our application, we hope to address these shortcomings. Its decision models and content have been validated by medical experts, while the application is still in development and has to be validated in real-life situations.