

The EXPERT-HeartHab Liaison: bringing grounded exercise guidelines to the patient

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BACKGROUND: Research provides evidence on the potential of using mHealth solutions for cardiac rehabilitation and self-management. Yet, factors such as lack of personalization and usability issues obstruct the widespread adoption and implementation of such systems. Furthermore, despite the existence of clinical guidelines, studies show that there is a big variance in the way exercise interventions are prescribed to patients. To overcome these implementation challenges using grounded guidelines, we created the EXPERT-HeartHab Liaison: a comprehensive mHealth solution consisting of the EAPC EXPERT-tool and the HeartHab app for self-management of cardiac disease.

METHODS: The EXPERT-tool is a valuable decision support system for clinicians to provide personalized exercise recommendations grounded on recognised, published guidelines and expert opinions. To seamlessly transfer these recommendations to the HeartHab app for patients, clinicians can directly access the EXPERT-tool from a dedicated dashboard. The training prescription is then presented to patients in an accessible manner using intelligible and persuasive design techniques in HeartHab. We evaluated clinicians' perspectives in a lab test with 6 participants: 3 study nurses, a physiotherapist and 2 cardiologists. The test was scenario driven, evaluating the integration of a dashboard with the EXPERT-tool to generate recommendations for a sample patient case; using the SUS scale, and a semi-structured interview. Additionally, a 4-month crossover trial with 32 CAD patients assessed patients' perspectives on the personalized recommendation and its impact on their motivation. At the end of the study, we conducted semi-structured interviews to collect patient perspectives.

RESULTS: All clinicians found it easy to generate exercise recommendations using the EXPERT-tool integrated in the dashboard and perceived it as very useful and valuable. The average usability score on the SUS scale was 79.1 with a grade ranking of 'excellent'. All clinicians were willing to use this guideline-based approach to prescribe exercise interventions. In the crossover trial, 4 patients had to be excluded, 3 did not use the app and one patient did not use the exercise training module. Amongst the remaining 24 patients, 96% achieved their recommended exercise target and 87.5% said that the personalized training goals and intelligible visualizations were motivating. 75% patients were willing to use the HeartHab app in a long-term self-management context.

CONCLUSION: The proposed EXPERT-HeartHab Liaison is a first step in closing the gap between clinicians and patients. It facilitates clinicians to generate grounded recommendations for exercise interventions in an easy-to-use and seamless manner. The personalized training goals motivate patients to adhere to rehabilitation recommendations and increases their willingness to use such mHealth solutions for self-management.