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A lifestyle and self-care focused smartphone application can improve risk factor outcomes in cardiac rehabilitation for patients after myocardial infarction

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Background: The fulfilment of guideline recommended cardiac rehabilitation (CR) targets in patients after acute myocardial infarction (AMI) is currently unsatisfactory. eHealth i.e. the use of electronic communication in healthcare, offers a new array of possibilities to provide clinical care and improve outcomes.

Purpose: To assess the efficacy of a web-based smartphone application designed to support adherence to lifestyle advice and self-control of risk factors, as a complement to traditional CR for improving risk factor outcomes, self-rated health and aerobic capacity in patients after AMI.

Methods: In this multi-centre randomized controlled trial, we included 150 patients with AMI (81% men, 60.4 ±8.8 years) who subsequently participated in CR. Additionally, patients randomized to the intervention group received access to the web-based smartphone application. Changes (delta) in dietary and smoking habits, self-rated health, weight, blood pressure (BP) and lipid profile between baseline, 2-weeks and 2-months follow-up were assessed on an intention-to-treat basis using linear and logistic regression analysis adjusted for age, sex and baseline risk factors. Additionally, changes in self-rated physical activity and submaximal aerobic capacity (W) on a bicycle ergometer test, as a measure of fitness, between 2-weeks and 6-months follow-up were assessed.

Results: Patients randomized to the intervention group achieved a larger reduction in BP than patients in the control group at 2-weeks (systolic BP -28 ±27 vs -16 ±24 mmHg, p=0.01) and 2-months follow-up (systolic BP -25 ±27 vs -16 ±27 mmHg, p=0.02; diastolic BP -13 ±16 vs -9 ±13 mmHg, p=0.046). Patients in the intervention group who smoked at baseline were significantly more often abstinent from smoking at 2-months follow-up, compared to smoking patients in the control group (76% vs 36%, p=0.03). While patients in the intervention group consumed significantly more fish and fruit at 2-weeks follow-up, there was no difference between the groups at two months post-AMI (Figure 1). There was no difference between the intervention and control groups in delta values for lipid levels, weight, self-rated health or self-rated physical activity. Both groups increased their submaximal aerobic capacity between 2-weeks and 6-months follow-up (intervention 13.6 ±19.9 W vs control 10.3 ±16.1 W, p=0.4).

Conclusion: Complementing traditional CR with a web-based smartphone application supporting adherence to lifestyle advice and self-control of risk factors has the potential to improve blood pressure and tobacco abstinence after an AMI.
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Figure 1. Intake of vegetables, fish, fruit and sweets, measured with a food frequency questionnaire (0-3 points for each food item).