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Smartwatch-assisted monitoring after cardiovascular hospitalization: a pilot study of feasibility and implementation challenges

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Introduction: Remote monitoring may support patients after hospitalization for heart failure or atrial fibrillation, but its implementation depends on digital accessibility and patients' ability to use the technology.[1-3] We evaluated clinical outcomes and practical challenges of smartwatch-assisted monitoring within the European HealthChain project.

Patients and Methods: This single-centre, non-randomized observational pilot included 27 patients receiving smartwatch-assisted monitoring after hospitalization for heart failure or atrial fibrillation and 46 controls receiving usual care. Patients were enrolled between March 2024 and January 2025, within six months after discharge. Heart rate, oxygen saturation and electrocardiographic recordings were collected using smartwatches paired with a smartphone, together with home devices for body weight and blood pressure. Data were transmitted through a smartphone application developed by the IT partner (VERSO) to the PULSEVITA portal for daily cardiologist review. Rehospitalizations during six months of follow-up and implementation barriers were assessed. Symptom burden was graded by NYHA class or EHRA score, according to diagnosis. Both groups completed the Generalized Anxiety Disorder 7-item scale (GAD-7) and the Kansas City Cardiomyopathy Questionnaire (KCCQ-12) at discharge to assess anxiety and health-related quality of life. Rehospitalization rates were compared using Fisher's exact test.

Results: The smartwatch was used for a mean of 26.8 days (range 7–49). During six months of follow-up, no rehospitalizations were recorded in the monitored group, compared with nine among controls (0/27 versus 9/46 [19.6%]; p = 0.022). Monitored patients were younger than controls (mean age 63.8 versus 70.6 years) and less symptomatic by NYHA class or EHRA score. At discharge, the monitored group also reported a lower symptom burden, with less limitation in activities such as hurrying or jogging (p = 0.004) and less impairment in enjoyment of life (p = 0.038). Practical barriers included limited digital literacy, lack of compatible smartphones, difficulties with device pairing and Bluetooth connectivity, and delayed data transmission. Some patients needed repeated instruction and family assistance. Difficulties completing requested measurements or responding to application prompts highlighted the need to distinguish technical problems from challenges in understanding and operating the system.

Conclusion: Smartwatch-assisted monitoring was feasible in selected patients, and no rehospitalizations occurred in the monitored group during follow-up. However, non-randomized allocation and baseline differences preclude conclusions about efficacy. Structured education, caregiver involvement and technical support are essential to make remote monitoring accessible to patients with limited digital skills.

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LITERATURE

1. Koehler F, Koehler K, Deckwart O, Prescher S, Wegscheider K, Kirwan BA, et al. Efficacy of telemedical interventional management in patients with heart failure (TIM-HF2): a randomised, controlled, parallel-group, unmasked trial. Lancet. 2018 Sep 22;392(10152):1047-1057. https://doi.org/10.1016/S0140-6736(18)31880-4
2. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, et al; Apple Heart Study Investigators. Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation. N Engl J Med. 2019 Nov 14;381(20):1909-1917. https://doi.org/10.1056/NEJMoa1901183
3. Masterson Creber R, Dodson JA, Bidwell J, Breathett K, Lyles C, Harmon Still C, et al; American Heart Association Cardiovascular Disease in Older Populations Committee of the Council on Clinical Cardiology and the Council on Cardiovascular and Stroke Nursing; Council on Quality of Care and Outcomes Research; and Council on Peripheral Vascular Disease. Telehealth and Health Equity in Older Adults With Heart Failure: A Scientific Statement From the American Heart Association. Circ Cardiovasc Qual Outcomes. 2023 Nov;16(11):e000123. https://doi.org/10.1161/HCQ.0000000000000123