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Lessons learnt in developing a virtual coach for smoking cessation and physical activity promotion.

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Background: Smoking and physical inactivity are two key preventable risk factors of cardiovascular disease. Yet, as with most health behaviors, they are difficult to change. In the interdisciplinary Perfect Fit project, scientists from different fields join forces to develop an evidence-based virtual coach that supports smokers in quitting smoking and increasing their physical activity. Intervention content, design and implementation as well as lessons learnt are presented in the hopes of guiding other research groups working on similar projects.

Methods: Numerous approaches were used and combined to support the development of the Perfect Fit virtual coach. Approaches include literature reviews, empirical studies, collaboration with end-users, content and technical development sprints, interdisciplinary collaboration and iterative proof-of-concept implementation.

Findings: The Perfect Fit intervention integrates evidence-based behavioral change techniques as well as new techniques focused on identity change, big data science, sensor technology and personalized real-time coaching. Intervention content of the virtual coaching matches communication preferences and individual needs of end users. Lessons learnt include ways to optimally implement and tailor interactions from the virtual coach (e.g., 'explain why user is asked for input', 'tailor timing and frequency of intervention components'). With regards to the development process, lessons learnt include strategies for effective interdisciplinary collaboration and technical development (e.g., 'Find a good balance between wishes of end-users and legal possibilities').

Discussion: The Perfect Fit development process was interactive, iterative and challenging at times. We hope that our experiences and lessons learnt can inspire and benefit others.