Title: Using rapid research designs to evaluate the effectiveness of behaviour change apps and wearables: an interview study

Background: Behaviour change apps and wearables rapidly evolve, which means gold standard methods such as randomised control trials can be unsuitable for evaluating their effectiveness. Rapid research designs (such as the multiphase optimisation strategy, microrandomised trials, N-of-1s, A/B tests) may increase the efficiency of effectiveness evaluations, however recent reviews indicate that these alternatives are not yet widely used.

Aim: To explore barriers and facilitators faced by researchers and industry professionals when using rapid research designs to evaluate the effectiveness of behaviour change apps and wearables.

Methods: Fifteen semi-structured interviews were conducted: four health behaviour change researchers; four HCI researchers; two industry data scientists; and four other industry professionals (product designers, developers and CEOs). A framework approach was used to understand participants’ experiences and perceptions of using rapid research designs. The Capability, Opportunity, Motivation - Behaviour (COM-B) framework was then applied to understand barriers and facilitators to using rapid research designs.

Results: Researchers and data scientists valued, and were motivated to use, rapid research designs. However, they believed that using such designs would result in their research not being funded or published. Despite being aware of rapid research designs, researchers felt they lacked the time and skills to implement these in practice, and statistically analyse results. Researchers, data scientists and industry professionals believed that automation could save time when implementing rapid research designs. Industry professionals used some rapid research designs but not for the purpose of evaluating effectiveness.

Conclusion: These findings may help to explain why rapid research designs are not yet widely used for evaluating behaviour change apps and wearables. Increasing researchers’ motivation and awareness of rapid research designs will not necessarily increase their uptake. Instead, opportunity barriers in using rapid research designs should be addressed by targeting funders and peer reviewers. Researchers also require support to learn the necessary experimental and statistical skills for using rapid research designs.