Cochrane Database of Systematic Reviews - - Cochrane Review

Continuous glucose monitoring systems for the diagnosis of cystic fibrosis-related diabetes

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Study design (if review, criteria of inclusion for studies)

Randomized controlled trials (RCTs) or quasiâ€•RCTs of digital health technologies for delivering or monitoring exercise programs in CF.

Participants

People with CF

Interventions

Digital health technologies

Outcome measures

Primary outcomes: 1. physical activity, 2. selfâ€•management behavior, and 3. pulmonary exacerbations. Secondary outcomes: 4. usability of technologies, 5. quality of life, 6. lung function, 7. muscle strength, 8. exercise capacity, 9. physiologic parameters, and 10. adverse events.

Main results

4 parallel RCTs (three singleâ€•center and one multicenter with 231 participants aged six years or older). The RCTs evaluated different modes of digital health technologies with distinct purposes, combined with diverse interventions. We identified important methodologic concerns in the RCTs, including insufficient information on the randomization process, blinding of outcome assessors, balance of nonâ€•protocol interventions across groups, and whether the analyses performed corrected for bias due to missing outcome data. Nonâ€•reporting of results may also be a concern, especially because some planned outcome results were reported incompletely. Furthermore, each trial had a small number of participants, resulting in imprecise effects. These limitations on the risk of bias, and on the precision of effect estimates resulted in overall lowâ€• to very lowâ€•certainty evidence. We undertook four comparisons and present the findings for our primary outcomes below. There is no information on the effectiveness of other modes of digital health technologies for monitoring physical activity or delivering exercise programs in people with CF, on adverse events related to the use of digital health technologies either for delivering or monitoring exercise programs in CF, and on their longâ€•term effects (more than one year). Digital health technologies for monitoring physical activity Wearable fitness tracker plus personalized exercise prescription compared to personalized exercise prescription alone One trial (40 adults with CF) evaluated this outcome, but did not report data for any of our primary outcomes. Wearable fitness tracker plus text message for personalized feedback and goal setting compared to wearable fitness tracker alone The evidence is very uncertain about the effects of a wearable fitness tracker plus text message for personalized feedback and goal setting, compared to wearable technology alone on physical activity measured by step count at sixâ€•month followâ€•up (mean difference [MD] 675.00 steps, 95% confidence interval [CI] âˆ’2406.37 to 3756.37; 1 trial, 32 participants). The same study measured pulmonary exacerbation rates and reported finding no difference between groups. Webâ€•based application to record, monitor, and set goals on physical activity plus usual care compared to usual care alone Using a webâ€•based application to record, monitor, and set goals on physical activity plus usual care may result in little to no difference on time spent in moderateâ€•toâ€•vigorous physical activity measured via accelerometry compared to usual care alone at sixâ€•month followâ€•up (MD âˆ’4 minutes/day, 95% CI âˆ’37 to 29; 1 trial, 63 participants). Low certaintyâ€•evidence from the same trial suggests that the intervention may result in little to no difference on pulmonary exacerbations during 12 months of followâ€•up (median 1 respiratory hospitalization, interquartile range [IQR] 0 to 3) versus control (median 1 respiratory hospitalization, IQR 0 to 2; P = 0.6). Digital health technologies for delivering exercise programs Webâ€•based versus faceâ€•toâ€•face exercise delivery The evidence is very uncertain about the effects of webâ€•based compared to faceâ€•toâ€•face exercise delivery on adherence to physical activity as assessed by the number of participants who completed all exercise sessions after three months of intervention (risk ratio 0.92, 95% CI 0.69 to 1.23; 1 trial, 51 participants).

Authors' conclusions

The evidence is very uncertain about the effects of an exercise program plus the use of a wearable fitness tracker integrated with a social media platform compared with exercise prescription alone and on the effects of receiving a wearable fitness tracker plus text message for personalized feedback and goal setting, compared to a wearable fitness tracker alone. Lowâ€•certainty evidence suggests

that using a webâ€•based application to record, monitor, and set goals on physical activity plus usual care may result in little to no difference in time spent in moderateâ€•toâ€•vigorous physical activity, total time spent in activity, pulmonary exacerbations, quality of life, lung function, and exercise capacity compared to usual care alone. Regarding the use of digital health technologies for delivering exercise programs in CF, the evidence is very uncertain about the effects of using a wearable fitness tracker plus personalized exercise prescription compared to personalized exercise prescription alone. Further highâ€•quality RCTs, with blinded outcome assessors, reporting the effects of digital health technologies on clinically important outcome measures, such as physical activity participation and intensity, selfâ€•management behavior, and the occurrence of pulmonary exacerbations in the long term are needed. The results of six ongoing RCTs identified through our searches may help clarify the effects of different modes of digital health technologies for delivering and monitoring exercise programs in people with CF.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD012953/abstract

See also

Ahmed MI, Fox R, Shinkins B, Sutton S, Tziaferi V, Gaillard EA. Continuous glucose monitoring systems for the diagnosis of cystic fibrosis-related diabetes (Protocol). Cochrane Database of Systematic Reviews 2018, Issue 2. Art. No.: CD012953. DOI: 10.1002/14651858.CD012953.

Keywords

Adolescent; Adult; information; non pharmacological intervention - psyco-soc-edu-org; Self-Management; Psychoeducation; Behavioural interventions; exercise;