Community Preventive Services Task Force

Physical Activity: Digital Health Interventions for Adults 55 years and Older

Community Preventive Services Task Force
Finding and Rationale Statement
Ratified April 2019

Table of Contents

Suggested citation:
The Community Preventive Service Task Force (CPSTF). *Physical Activity: Digital Health Interventions for Adults 55 Years and Older*. The Community Guide [www.thecommunityguide.org]. The Community Preventive Service Task Force, Atlanta, Georgia, 2019. https://doi.org/10.15620/cdc/168561

CPSTF Finding and Rationale Statement

Intervention Definition

Digital health interventions to promote physical activity among adults 55 years and older use one or more of the following to deliver guidance and support that is tailored to individuals' activity level, age, and health status:

- Web-based interactive content (e.g., virtual coaching)
- Telephone sessions with intervention providers or automated voice messages and reminders
- Text messages and reminders
- Apps with goal-setting, activity tracking, and reminder functions

Interventions also may include print materials or devices designed to provide feedback (e.g., pedometers, accelerometers).

CPSTF Finding (April 2019)

The Community Preventive Services Task Force (CPSTF) recommends digital health interventions to promote physical activity among adults 55 years and older based on sufficient evidence of effectiveness in increasing physical activity. Interventions that delivered tailored physical activity guidance and support through the web, by telephone, or by text message were effective in increasing measures of walking and time spent in moderate to vigorous physical activity.

Rationale

Basis of Finding

The Community Preventive Services Task Force (CPSTF) uses recently published systematic reviews to conduct accelerated assessments of interventions that could provide program planners and decision-makers with additional, effective options. The following published review was selected and evaluated by a team of specialists in systematic review methods, and in research, practice, and policy related to physical activity:

> Muellmann S, Forberger S, Mollers T, Broring E, Zeeb H, Pischke CR. Effectiveness of eHealth interventions for the promotion of physical activity in older adults: a systematic review. *Preventive Medicine* 2018; 108:93–110.

The team reviewed the evidence summarized in the publication and examined included studies to collect additional data on study, intervention, and population characteristics. Study-specific measures of physical activity were converted to relative percent change and used to generate summary effect estimates. The CPSTF assessment considered the narrative findings of the published review, converted effect estimates and additional information from the included studies, and expert input from team members and the CPSTF.

The published systematic review included 20 studies (search period through March 2017). Included studies compared effectiveness of digital health interventions with usual care or wait list controls (10 studies) or other promotion techniques such as printed materials (10 studies). The published review considered these bodies of evidence separately. The CPSTF also examined the consolidated body of evidence because comparison group interventions were of low intensity and included little or no interaction. Estimates of change from 18 of the 20 included studies are summarized in Table 1.

Table 1: Findings on Physical Activity

Body of Evidence	Number of Studies (# Study Participants)	Median relative percent difference in study measures of physical activity
Digital health intervention (any)	17 studies (6361)	28% increase (IQI: 12% to 78%)
Web or internet-based interventions	9 studies (4652)	28% increase (IQI: 12% to 134%)
Telephone-based interventions	5 studies (1573) *	42% increase (IQI: 18% to 92%)
Text message-based interventions	3 studies (136)	23% increase (study estimates: 6%, 23%, 34%)

*One additional study reported findings for each of 5 strata based on baseline activity level
IQI: interquartile interval

Two of the included studies examined different physical activity outcomes and were considered separately. One study from New Zealand compared the effects of physical activity counseling with telephone-based support against the effects of exercise classes. After two years, exercise class participants had higher rates of self-reported physical activity levels (46.6% reported getting at least 150 minutes of physical activity over 5 or more sessions per week) than participants who received counseling (40.6%). Both groups, however, experienced substantial and statistically significant improvements in physical activity from baseline. In the remaining study, an app-based intervention did not increase measures of aerobic fitness after 10 weeks.

All included studies examined the effectiveness of tailored physical activity guidance and support, and most included physical activity tracking with a device or activity log. Studies included a median of 182 participants (IQI: 48 to 279 participants), although 7 studies included fewer than 50 participants. Interventions were delivered for a median of 3 months (IQI: 2 to 6 months). The median study duration was 6 months (IQI: 2.6 to 12 months), although five studies had follow-up periods of 3 months or less. Only two studies had assessment periods longer than 12 months, indicating a need for additional research on longer term effects.

Applicability and Generalizability Issues

Most of the included studies were conducted in the United States (11 studies). The remaining studies were conducted in The Netherlands (3 studies), Belgium (2 studies), Australia (1 study), New Zealand (1 study), Spain (1 study), and Malaysia (1 study).

Based on inclusion criteria, studies were restricted to a mean age of 55 years and older. The actual median study age was 64 years (IQI: 61 to 70 years). Four studies recruited participants with mean ages of 70 years or higher, and results from this subset were similar to overall findings.

Overall, there was limited reporting of other demographic characteristics. Of the 11 studies conducted in the United States, six reported on participants' race, ethnicity, and socioeconomic studies, but they did not stratify results using these factors.

Based on the included evidence, the CPSTF finding is likely applicable to U.S. interventions that recruit adults aged 55 years and older.

Data Quality Issues

The published systematic review included randomized controlled trials (18 studies) or quasi-experimental designs (2 studies). Study quality was evaluated using the Cochrane risk of bias assessment tool (Higgins 2011). Summary risk of bias was assessed as low (1 study), moderate (11 studies), and high (8 studies). Important potential limitations included unclear risk of bias in selective reporting (14 studies) and unclear or high risk of bias due to incomplete outcome data (6 studies). Physical activity outcomes were based on objective measurements (5 studies), self-report (13 studies), or both (2 studies).

Other Benefits

The published review did not report or postulate on additional benefits of these interventions. Enhanced functions of current devices, such as interactive features and access to social support resources may lead to improvements in recruitment, participation, and sustained engagement.

Potential Harms

The included studies did not report any major adverse events associated with these interventions. Intervention studies focused on fall prevention were not considered in this review, and none of the included studies reported on falls as an outcome of the intervention or examined differences between active and inactive study participants.

One study noted that musculoskeletal complaints were common but did not result in participants dropping out. The primary mode of promoted physical activity in included studies was graduated increases in daily or regular walking to encourage participation and reduce risks of musculoskeletal injury.

Considerations for Implementation

Findings of this review support the use of tailored digital health interventions to provide physical activity guidance and support to adults aged 55 years and older. Although studies showed differences in effect estimates by mode (i.e., web, telephone, text), the increasing popularity of smartphones among older adults should offer opportunities to examine user preferences.

The rapid evolution of digital health technology is likely to provide researchers opportunities to evaluate effectiveness of devices with substantially enhanced content and interactivity. These may include the integration of behavior change techniques such as social support, prompts and reminders, rewards, and behavioral self-monitoring (Lyons 2014). Scalability of community-based interventions will likely depend on the use and capabilities of devices owned by recruited participants.

Evidence Gaps

Based on the evidence and findings of the *Muellmann et al.* systematic review, the CPSTF identified several research questions for future study.

- What are the longer-term effects of these interventions (i.e., 6-12 months following implementation)? Longer term studies would also allow researchers to examine the effects of increased physical activity on clinical and health outcomes.
- How do interventions affect rates of injuries, including falls? How do rates vary between active, inactive, and comparison group participants?
- How does effectiveness vary by participant race, ethnicity, and socioeconomic status?
- How are participation and effectiveness affected by the integration of enhanced technologies, such as smartphones, with monitoring functions?

References

Muellmann S, Forberger S, Mollers T, Broring E, Zeeb H, Pischke CR. Effectiveness of eHealth interventions for the promotion of physical activity in older adults: a systematic review. *Preventive Medicine* 2018;108:93-110.

Higgins JP, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0. Updated March 2011: The Cochrane Collaboration, 2011 http://www.cochrane-handbook.org/.

Lyons EJ, Lewis ZH, Mayrsohn BG, Rowland JL. Behavior change techniques implemented in electronic lifestyle activity monitors: a systematic content analysis. *J Med Internet Res* 2014;16:e192.

Disclaimer

Document last updated June 4, 2019