Community Preventive Services Task Force

Nutrition and Physical Activity: Worksite Digital Health and Telephone Interventions to Increase Healthy Eating and Physical Activity

Community Preventive Services Task Force
Finding and Rationale Statement
Ratified March 2021

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CPSTF Finding and Rationale Statement

Context

Poor diet and inadequate physical activity are well established risk behaviors for obesity, cardiovascular disease, cancer, and diabetes mellitus (Ford et al., 2012; Lloyd-Jones et al., 2010; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2020; U.S. Department of Health and Human Services, 2018). These risk behaviors often cluster (Fine et al., 2004; Gillman et al., 2001), which creates an opportunity to intervene on multiple risk behaviors simultaneously (Spring et al., 2012).

Many behavioral interventions that address poor diet and physical inactivity use a combination of self-monitoring and goal setting, which are both based on behavioral theory (Burke et al., 2011). Participants record their dietary intake and physical activity to self-monitor and increase their awareness of these behaviors and set clear, measurable goals for themselves (Foster et al., 2005). Because self-monitoring and goal setting are intervention approaches that often include recording information, they are often incorporated into digital health interventions (Coons et al., 2012). Over the past decade, the use of digital devices such as computers, smartphones, and tablets to foster or support behavior change has steadily increased (Michie et al., 2018).

Digital health interventions have the potential to reach a large number of people (Beleigoli et al., 2019). In the United States, 93% of adults use the internet (Pew Research Center, 2021a); 85% have access to a smartphone (Pew Research Center, 2021b); and 77% have home broadband (Pew Research Center, 2021a).

Worksite health programs and policies provide opportunities to promote health and prevent disease. Effective worksite interventions have the potential to reduce health risks and improve the quality of life for more than 138 million workers in the United States (Centers for Disease Control and Prevention, 2018).

Intervention Definition

Worksite digital health and telephone interventions to increase healthy eating and physical activity aim to support individuals in work settings who are interested in improving these behaviors. Interventions are delivered through websites, mobile apps, text messages, emails, or one-on-one telephone calls. Interventions include educational information plus one or more of the following:

- Coaching or counseling from trained professionals who provide personalized assistance related to eating and physical activity behaviors, or weight
- Self-monitoring to record eating or physical activity behaviors, or weight
- Goal setting related to eating or physical activity behaviors, or weight
- Computer-generated feedback that provides tailored information based on performance (i.e., prompts, meeting goals, and adherence)

Interventions also may include one or more of the following:

- Social support from peers through social media, internet forums, or discussion groups
- Motivational strategies that include incentives, rewards, prompts, and gaming techniques

CPSTF Finding (March 2021)

The Community Preventive Services Task Force (CPSTF) recommends digital health and telephone interventions that are implemented in work settings and focus on improving healthy eating and physical activity among adults interested in improving these behaviors. Sufficient evidence of effectiveness shows these interventions lead to meaningful increases in time spent in physical activity, increases in fruit and vegetable intake, and decreases in fat intake.

CPSTF also recommends digital health and telephone interventions to increase healthy eating and physical activity among adults interested in improving these behaviors in community-based settings [https://www.thecommunityguide.org/findings/nutrition-and-physical-activity-community-based-digital-health-and-telephone-interventions-increase-healthy-eating-and-physical-activity] and among students interested in improving these behaviors attending institutions of higher education [https://www.thecommunityguide.org/findings/nutrition-and-physical-activity-digital-health-and-telephone-interventions-increase-healthy-eating-and-physical-activity-among-students-institutions-higher-education].

Rationale

Basis of Finding

The CPSTF recommendation is based on evidence from a review of eight studies with 11 arms (search period: January 2009 - June 2020).

A team of specialists in systematic review methods and subject matter experts synthesized select dietary (e.g., fruit and vegetable intake), physical activity (e.g., time spent in physical activity), weight-related (e.g., Body Mass Index [BMI]), and clinical (e.g., cholesterol) outcomes to assess intervention effectiveness. Many of the included studies reported multiple dietary, physical activity, weight-related, and clinical outcomes.

Evidence from the eight included studies showed these interventions increased fruit and vegetable intake, decreased fat intake, and increased time spent in physical activity. See results in the Table. Interventions did not demonstrate meaningful changes in weight-related and clinical outcomes, as described below. Participants used instruments with demonstrated validity and reliability to self-report their dietary and physical activity behaviors.

Table. Intervention Effects on Dietary and Physical Activity Outcomes

Outcome	Studies (Arms)	Effect	Direction of Effect
Physical Activity Behaviors			
Time Engaged in Physical Activity	3 studies (6 arms)	Median: +38.5 minutes/week, (Range: -20.0 to 127.0 minutes/week; 2 studies, 4 arms) 1 study, 2 arms could not be calculated in median above: 1 arm favorable, 1 arm no change	Favors the intervention
Dietary Behaviors			

Outcome	Studies (Arms)	Effect	Direction of Effect
Fruit and Vegetable Intake	3 studies (6 arms)	Median: +0.44 servings/day, (Range: -0.10 to 1.00 servings/day; 2 studies, 4 arms) 1 study, 2 arms could not be calculated in median above: 1 of 2 arms was favorable	Favors the intervention
Fat Intake	3 studies (4 arms)	3 arms favorable, 1 arm no change	Favors the intervention

Additional Physical Activity and Dietary Outcomes

Two studies (2 arms) reported overall diet quality scores, and both were favorable. One study (1 arm) reported a favorable decrease in sugar intake. Two studies (2 arms) reported a different measure of physical activity other than minutes per week, and both were favorable. Additionally, one study (1 arm) reported a significant reduction in sedentary time per week.

Additional Outcomes of Interest

Four studies (5 arms) reported BMI results. Two arms showed favorable results; two arms reported no change; and one arm only reported favorable results for women. Two additional studies (2 arms) reported reductions in weight.

Three studies (4 arms) reported various measures of health-related quality of life with inconsistent findings. Two studies (2 arms) reported results for additional clinical outcomes, including changes in systolic blood pressure, diastolic blood pressure, total cholesterol, high density lipoprotein, and glucose. Neither study reported a change for these outcomes.

Applicability and Generalizability Issues

Based on evidence from the systematic review, this finding should be applicable to all working adults who are interested in improving these health behaviors.

Included studies were conducted in the United States (6 studies), Denmark (1 study), and Germany (1 study). Only one study from an urban area reported on population density.

All included studies recruited participants from large worksites ($\geq$300 employees). Participants included management and administrative personnel (3 studies), management, clerical, or labor workers (2 studies), social and healthcare workers in a nursing home (1 study), shift workers with physically demanding work (1 study), and government workers (1 study). Seven studies provided enough information to assess participants' income. Participants represented populations considered to be lower income (1 study), higher income (3 studies), or a combination of higher, middle, and lower income (3 studies).

Across all eight studies, participants had a mean age of 47.4 years (IQI: 44.1 to 50.5 years). Studies reported higher proportions of females than males (on average, 70% were female). Intervention duration ranged from one month to 12 months, with a median duration of six months.

The six studies from the United States reported racial and ethnic distributions that demonstrated intervention effectiveness across groups. Studies included participants self-identified as White (median 57.3%; 6 studies), Black or

African American (median 7.1%; 5 studies), Hispanic or Latino (median 4.0%; 5 studies), Asian (median: 4.0%; 4 studies), or other race/ethnicity (median 3.6%; 5 studies).

Included studies did not require participants to have overweight (BMI between 25 and <30) or obesity (BMI 30 or higher), based on definitions from the Centers for Disease Control and Prevention (2020). Most studies, however, included participants who were in these weight categories. Participants across five studies reported a baseline BMI of 25 or higher; the remaining three studies did not report this information.

Data Quality Issues

Study designs included randomized controlled trials (4 studies, 7 arms), group randomized controlled trials (3 studies, 3 arms), and other controlled trials (1 study, 1 arm).

The most common study limitation, according to Community Guide quality scoring methods, was loss to follow-up. While studies did not report challenges with recruitment, six studies reported attrition greater than 20%. Results did not differ by loss to follow-up.

Other Benefits and Harms

CPSTF noted the convenience of digital health as a channel for intervention delivery.

CPSTF identified increased risk of injury from increased physical activity as a potential harm. Programs may reduce this risk by helping participants select appropriate activity types. None of the included studies reported any musculoskeletal injuries.

Considerations for Implementation

The following considerations for implementation are drawn from studies included in the evidence review, the broader literature, and expert opinion, as noted below. It is important to note that these interventions were conducted among working adults; therefore, non-working adults would not benefit to the same degree. Additionally, the CPSTF does not endorse any specific digital health intervention.

- Interventions incorporating digital health are a convenient way to reach individuals in worksites. They have the potential for broad dissemination and scalability (Carter et al., 2013; Roess, 2017; Svetkey et al., 2015).
- Most of the included studies were less than 12 months in duration. Interventions aiming to help adults lose weight may require greater intensity, longer durations, or both. Included studies had interventions of varying levels of intensity (e.g., daily vs. weekly). Implementers might consider their population of interest to determine reasonable expectations. CPSTF notes populations may respond differently to varying levels of intensity. For example, younger adults may be more comfortable tracking their daily behaviors on mobile devices than older adults would be.
- Programs may want to consider participants' electronic literacy. While this was not frequently reported in the included studies, CPSTF suggests worksites consider tailoring interventions to the electronic and literacy levels of their employees.
- CPSTF suggests implementers should make programs accessible to workers of all types of jobs and all races/ethnicities. Included studies among shift workers, city and county employees, and laborers, and included studies with higher proportions of racial/ethnic minorities reported favorable findings
- The digital divide needs to be considered when using technology other than telephones to implement programs. Key issues include participants' access to affordable internet networks or mobile devices and digital readiness.

Worksite programs may be able to provide employees with resources and opportunities that address this concern.

- Implementers may want to consider the built environment around participants. It is important for participants to have access to healthier foods and safe places where they can be physically active.
- Behavioral change theories were applied in two of the included studies. CPSTF suggests implementers incorporate theories into program designs more explicitly.
- Data security and privacy issues need to be considered when individuals enter personal information electronically.
- Digital health is rapidly evolving. Newer digital health interventions, such as those incorporating social media platforms, were not represented in this body of evidence.

Evidence Gaps

The CPSTF identified several areas that have limited information. Additional research and evaluation could help answer the following questions and fill existing gaps in the evidence base.

- How effective are interventions in worksites that are small (less than 100 employees) or medium sized (100 to less than 300 employees)?
- Are these interventions effective in rural areas?
- What are the long-term effects of digital health interventions among working adults? Two studies reported post-intervention follow-up measurements. Both studies reported improvements in dietary and physical activity behaviors. Only one study reported BMI, which was favorable. More studies with a follow-up period extending past six months would provide more evidence about the broader impact of these interventions on dietary and physical activity behaviors and clinical and weight-related outcomes.
- What is the effect of interventions that last longer than 12 months?
- What are the effects of incorporating wearable devices or trackers in the intervention?
- What are the effects of adding social media to the intervention?
- What is the ideal level of intensity for this type of intervention?

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Disclaimer

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Document last updated February 1, 2022