

Physical Activity: Family-Based Interventions

Community Preventive Services Task Force Finding and Rationale Statement Ratified October 2016

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CPSTF Finding and Rationale Statement

Context

Physical activity among children is a public health priority (USDHHS, 2008a). The U.S. Department of Health and Human Services recommends that young people ages 6–17 years participate in at least 60 minutes of physical activity daily (USDHHS, 2008b). Regular physical activity in childhood and adolescence improves strength and endurance, helps build healthy bones and muscles, helps control weight, reduces symptoms of anxiety and depression, and may improve cardiovascular health (USDHHS, 2008a). Most children in the United States, however, are not active enough to achieve health benefits (Janssen et al., 2010; Andersen et al., 2006).

Intervention Definition

Family-based interventions actively engage families to increase physical activity among children by combining activities to build family support with health education. Interventions include one or more of the following:

- Goal-setting tools and skills to monitor progress, such as a website to enter information
- Reinforcement of positive health behaviors, such as reward charts or role modeling of physical activity by parents or instructors
- Organized physical activity sessions, such as instructor led opportunities for active games

Interventions may provide information about other lifestyle behaviors such as choosing healthier foods or reducing screen time.

CPSTF Finding (October 2016)

The Community Preventive Services Task Force (CPSTF) recommends interventions that actively engage families to increase physical activity by combining activities to build family support with health education. This finding is based on sufficient evidence of effectiveness in modestly increasing physical activity among children.

Rationale

Basis of Finding

The 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 increasing physical activity.

Brown HE, Atkin AJ, Panter J, Wong G, Chinapaw MJM, van Sluijs EMF. Family-based interventions to increase physical activity in children: a systematic review, meta-analysis and realist synthesis. *Obesity Review* 2016;17(4):345-60.

The systematic review included 47 studies (search period through September 2015). The review included a meta-analysis and a realist synthesis.

The CPSTF finding is based on results from the published review, additional information from the meta-analysis, and expert input from team members and the CPSTF.

The CPSTF finding is based on the 19 studies used for the meta-analysis which reported enough information to calculate a standardized effect size. The CPSTF did not consider studies used in the realist synthesis because they reported qualitative assessments only. Community Guide methods do not allow for included studies that only report qualitative data.

Of the 19 studies included in the meta-analysis, 15 reported favorable results. There was a small but statistically significant increase in physical activity among children in the intervention groups (standardized mean difference [SMD] of 0.41; 95% confidence interval [CI] 0.15, 0.67; $p < 0.001$). When one outlier study was removed due to its magnitude of effect and weight, analysis showed a smaller but still significant increase in physical activity for the intervention groups (SMD of 0.29, CI 0.14, 0.45). Of the included studies, one was a pilot and another was a feasibility study.

Of the studies included in the meta-analysis, 16 assessed physical activity using objective methods (pedometers, accelerometers, or direct observation), and 3 assessed physical activity using subjective methods (questionnaires, recall diaries, interviews). The Community Guide review team conducted additional analyses to assess whether effects varied by the way physical activity was measured. The SMD when physical activity was directly measured through accelerometers (9 studies), pedometers (6 studies), or direct observation (1 study) was 0.50, and the SMD when physical activity was assessed through self-reported data was 0.25.

Applicability and Generalizability Issues

Included studies were conducted in the United States (11 studies), the United Kingdom (3 studies), Australia (3 studies), Singapore (1 study), and New Zealand (1 study). Interventions lasted from 8 days to 12 months, and follow-up ranged from 1 to 36 months. Interventions were delivered by community leaders (often selected for their cultural connection to participants), healthcare providers, researchers, or teachers. Interventions primarily took place in schools, afterschool programs, homes, community centers, churches, universities, or research institutes.

Brown, et al. had broad definitions for family and caregiver, and did not exclude studies based on how they defined these terms. All of the evaluated interventions targeted families with healthy children aged 5–12 years. Five studies included girls only, and the remaining studies included roughly equal numbers of boys and girls. Study populations included children who were all considered to be healthy weight (4 studies), children who were mostly overweight or obese (3 studies), or children whose weight was not reported (12 studies).

Included studies addressed physical activity only (8 studies) or physical activity plus additional behaviors such as dietary habits (11 studies). Intervention strategies included education (19 studies), goal-setting (7 studies), reinforcement of positive health behaviors (4 studies), and role modeling (4 studies). Interventions may have included more than one strategy.

Data Quality Issues

Brown, et al. reported a quality assessment and The Community Guide review team conducted an additional assessment.

Brown, et al. conducted a quality assessment of studies based on the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool, which rates studies on the following categories: selection bias, study design, confounders, blinding, data collection methods, and withdrawal or dropout (EPHPP, 2009). The EPHPP tool provides guidance for researchers to give an assignment of strong, moderate, or weak for each category. The number of moderate or weak ratings are summed and used to assign an overall study rating of strong, moderate, or weak. Brown, et al. found

common weaknesses of study quality were blinding and selection bias. Overall, one study received a strong rating, 11 studies were rated as moderate, and the remaining 7 studies were rated as weak.

The Community Guide review team conducted an additional quality assessment using Community Guide quality scoring methods which assign possible limitations to the following categories: description (1 limitation), sampling (1 limitation), measurement (1 limitation each for exposure and outcome), data analysis (1 limitation), interpretation of results (3 limitations – completion rate, bias, confounding), and other (1 limitation). To approximate Community Guide quality scoring methods, a limitation was assigned when the Brown, et al. review reported a rating of moderate or weak for the following categories: selection bias, confounders, blinding, data collection methods, and withdrawals and dropouts. Consistent with Community Guide methods, a study rating of good (0-1 limitation), fair (2-4 limitations), or limited (>4 limitations) was assigned, depending on the number of limitations, and studies were categorized based on suitability of study design as greatest, moderate, or least. Overall, 1 study had greatest suitability of design and good quality of execution, 15 had greatest suitability of design with fair quality of execution, 1 study was moderate suitability of design and fair quality of execution, 1 study was least suitability of design and fair quality of execution, and 1 study had greatest suitability of design and limited quality of execution.

Other Benefits and Harms

Subject matter experts who participated in the Community Guide review noted that interventions may increase family functioning and engagement and thereby improve family psychosocial environments.

No harms were identified.

Considerations for Implementation

Brown, et al. recommend the following for practitioners and policy-makers based on studies included in both the meta-analysis and realist synthesis.

- Family-based interventions should be tailored to consider the ethnicity of the family, parental motivation to increase children's physical activity, and time constraints due to work and school responsibilities.
- Combining goal-setting and reinforcement techniques improve physical activity by increasing motivation.
- The family psychosocial environment should be considered when designing interventions to increase physical activity among both children and their families. These efforts should include a focus on the child as the agent of change.

Evidence Gaps

Brown, et al. stated that further research is needed on the effectiveness of interventions that target certain groups based on demographic characteristics (i.e., single-sex interventions). In this review, 7 interventions that included girls only were more likely to be effective than interventions that included boys and girls. The intervention strategies varied between studies, however, so it was difficult to draw a conclusion on effectiveness based on sex. Further research is needed to understand differential effects of interventions that include single-sex or mixed-sex populations.

References

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Disclaimer

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

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