



Strengthen the Evidence Base for Maternal and Child Health Programs

Physical Activity

Physical Activity is one of fifteen Maternal and Child Health (MCH) National Performance Measures (NPMs) for the State Title V MCH Services Block Grant to States program.¹

NPM 8: Physical Activity is focused on increasing the percent of children and adolescents who are physically active.² More specifically, **NPM 8.1: Physical Activity – Ages 6 through 11** is the percent of children ages 6 through 11, who are physically active at least 60 minutes per day. **NPM 8.2: Physical Activity – Ages 12 through 17** is the percent of children ages 12 through 17, who are physically active at least 60 minutes per day.³

The aim of this review of the recent literature is to highlight practical strategies that State Title V programs can support and/or implement to increase physical activity for children and adolescents. This report will highlight interventions to support physical activity in settings where children and adolescents live, learn, and play, as well as policy changes that facilitate increased physical activity in communities and encourage healthy behaviors.

The full report and supplemental implementation resources can be found at: www.mchevidence.org/documents/reviews/npm-8-physical-activity.pdf, and www.mchevidence.org/tools/npm/8-physical-activity.php. This review was

conducted as part of Strengthen the Evidence Base for MCH Programs, a Health Resources and Services Administration (HRSA)-funded initiative that aims to support states in their development of strategies to promote the health and well-being of MCH populations.

Background

Children need physical activity to grow up strong and healthy. Physical activity is vital for children's health, well-being, and development, now and in the future.⁴ The promotion of physical activity across the life span can be viewed as an important component of public health action.⁵ According to the World Health Organization (WHO), physical inactivity is a global health problem.⁶ Physical activity, along with proper nutrition, is beneficial to people of all ages, backgrounds, and abilities; providing opportunities to be active early on puts children on a path to better physical and mental health.⁷

Physical activity guidelines. In 2018, the United States Department of Health and Human Services (USDHHS) issued the *Physical Activity Guidelines for Americans, 2nd edition*, to provide science-based guidance to help people ages 3 years and older improve their health through participation in regular physical activity, reflecting the extensive new

Rachel Brady, PT, DPT, MS
 Ian T. Le, MPA
 Keisha Watson, PhD
 Emma Hartley, BA
 Rochelle Mayer, EdD
 Deborah F. Perry, PhD
 John Richards, MA, AITP

National Center for Education
 in Maternal and Child Health
 Georgetown University

OCTOBER 2020

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number U02MC31613, MCH Advanced Education Policy, \$3.5 M. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.

¹ <https://mchb.tvisdata.hrsa.gov/uploadedfiles/TvisWebReports/Documents/blockgrantguidance.pdf>

² <https://mchb.tvisdata.hrsa.gov/PrioritiesAndMeasures/NPMDistribution>

³ NPM 8: Physical Activity is comprised of two indicators for specific age groups: NPM 8.1 is Physical Activity – Ages 6 through 11 and NPM 8.2 is Physical Activity – Ages 12 through 17. The decision was made to create one evidence review given the large number of studies that include both age ranges. One report eliminates duplication and also allows for better framing developmentally.

⁴ <https://raisingchildren.net.au/toddlers/nutrition-fitness/physical-activity/physical-activity-how-much>

⁵ https://www.euro.who.int/__data/assets/pdf_file/0020/101684/E90191.pdf

⁶ <https://www.who.int/ncds/prevention/physical-activity/inactivity-global-health-problem/en/>

⁷ <https://www.hhs.gov/fitness/be-active/importance-of-physical-activity/index.html>

knowledge gained since the guidelines were first released in 2008. This most recent edition discusses the proven benefits of physical activity and outlines the amounts and types of physical activity recommended for different ages and populations. The guidelines recommend that children and adolescents ages 6 through 17 engage in 60 minutes or more of moderate-to-vigorous physical activity (MVPA) on a daily basis. The guidelines also state that physical activity for school-aged children and adolescents should include aerobic activity as well as age-appropriate muscle- and bone-strengthening activities (USDHHS, 2018).

Development and physical activity. Parents, caregivers, and other adults can play an important role in providing age-appropriate opportunities for physical activity. They can encourage active play in children and also encourage age-appropriate, sustained, and structured opportunities for physical activity as children grow to provide an important foundation for health-promoting physical activity (USDHHS, 2018).

Physical activity for children with disabilities. The physical activity guidelines are applicable for all children and youth irrespective of gender, race, ethnicity, or income level and unless specific health conditions indicate the contrary.⁸ Whenever possible, children with special health care needs (CSHCN) and children with disabilities should meet the guidelines.

Evidence-based or Informed Strategy Measures (ESMs)

Across the states and jurisdictions that chose physical activity as one of the NPMs, there are 52 ESMs that have been chosen by Title V agencies to monitor progress in advancing NPM 8. These ESMs fall into three categories:

- 3 measure activities directed to professionals (e.g., training activities, technical assistance),
- 14 measure activities that are directed to families and their children (e.g., outreach materials to families, family-to-family support, development of care coordination plans), and

- 35 measure activities related to systems-building (e.g., engagement of stakeholder groups, quality improvement initiatives, collaboration between systems of care).

Findings from this report—specifically the evidence-based and evidence-informed interventions identified—can be used by Title V programs as models to support through funding of local organizations or implement.

Fifty-two ESMs currently focus on NPM 8. These can be organized by the levels of the “MCH Pyramid,”⁹ the conceptual service framework for the Title V MCH Block Grant program:¹⁰

- 38 measure activities related to public health services and systems (foundational level of the pyramid),
- 14 measure strategies related to enabling services (middle level of the pyramid), and
- Currently no Title V program is funding strategies related to direct services in regard to improving physical activity.

The MCH Evidence Center uses Results-Based Accountability (RBA)¹¹ as a conceptual framework to track how ESMs are measured. This framework consists of increasing levels of measurement across four quadrants (Quadrant 1 being the simplest measurement and Quadrant 4 being the most complex). States and jurisdictions should focus efforts in expanding how they measure programs by moving up the RBA quadrant scale.^{12, 13}

- 50 current transition ESMs measure effort:
 - 32 ESMs fall within Quadrant 1 (measuring the quantity of agency effort) and answer the question “what did we do?” (e.g., counts and “yes/no” activities).
 - 18 ESMs fall within Quadrant 2 (measuring the quality of effort) and answer the question “how well did we do it?” (e.g., reach, quality of materials, satisfaction of intervention).
- 2 current transition ESMs measure effect (e.g., increases in skills/knowledge, change in behavior or circumstance):
 - 1 ESM falls within Quadrant 3 (measuring the quantity of the effect) to answer the question “is anyone better off?” (e.g., numbers of providers with increased knowledge).

⁸ https://www.who.int/dietphysicalactivity/factsheet_young_people/en/

⁹ Title V Maternal and Child Health Services Block Grant to the States Program: Guidance and Forms for the Title V Application/Annual Report (OMB No. 0915-0172; Expires 12/31/2020).

¹⁰ The conceptual framework for the services of the State Title V MCH Block Grant is envisioned as a pyramid with three tiers of services and levels of funding that provide comprehensive services. A goal is to “move on down” the pyramid with more states and jurisdictions engaging in public health services and systems. See <https://mchb.tvistdata.hrsa.gov/Glossary/Glossary> for a graphical representation of the pyramid.

¹¹ RBA is described in the RBA Implementation Guide <http://raguide.org/index-of-questions/>

¹² ESM Review & Resources: National Summary <https://www.mchevidence.org/documents/ESM-Review-National-Summary.pdf>

¹³ To search the MCH Library to find state ESMs, visit: <https://www.mchlibrary.org/evidence/state-esms.php>

- 1 ESM falls within Quadrant 4 (measuring the quality of the effect) and answer “how are they better off?” (e.g., percentages of families whose self-efficacy improved).

Methods and Results

This review highlights evidence reported by the Centers for Disease Control and Prevention (CDC)¹⁴ and the Robert Wood Johnson Foundation (RWJF)¹⁵ and examines recently published studies from 2018-2020. The year 2018 was chosen to coincide with the publication of the most recent physical activity guidelines (USDHHS, 2018). Peer-reviewed studies were identified by searching three online databases.

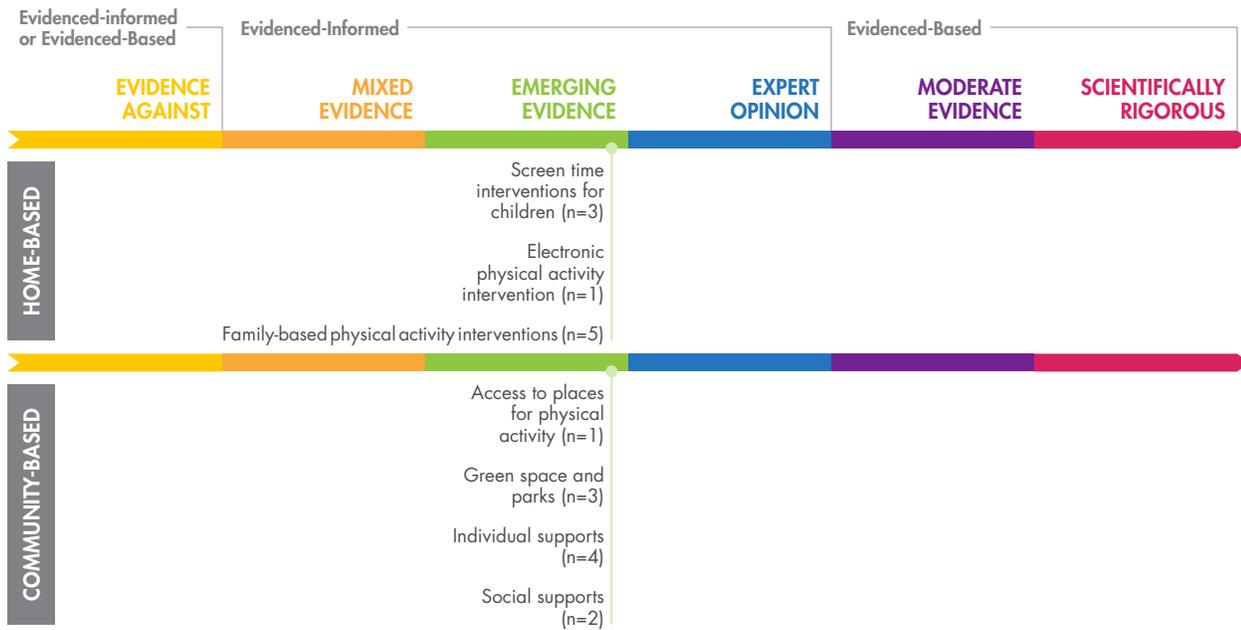
Ninety-two studies (n=92) met the inclusion criteria.¹⁶ The intervention types identified by the CDC and RWJF provided a roadmap to categorize the included studies. Each study received a rating of effectiveness based on its own merit and each intervention type was rated for its overall level of evidence to speak to the public health impact. The intervention types were then placed along a continuum from *evidence against* (least favorable) to *scientifically rigorous* (most favorable) by setting.



¹⁴ <https://www.cdc.gov/physicalactivity/activepeoplehealthynation/strategies-to-increase-physical-activity/index.html>

¹⁵ <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies?f%5B0%5D=health-factor%3ADiet%20and%20Exercise>

¹⁶ Refer to the full report for the inclusion and exclusion criteria and a summary table of evidence-based and evidence-informed strategies to increase physical activity by setting, target audience, intervention type, description, and overall evidence rating.



Key findings. Overall, 14 key findings emerged from the analysis:

- In terms of setting, the vast majority of studies were in schools and youth programs—73 of 92 studies (79%). Ten studies were conducted in the community (11%) and 9 studies took place in the home (10%).
- In the school-based and youth programs setting, the *most prevalent* intervention types were physically active classrooms, multicomponent school-based obesity prevention programs, comprehensive school physical activity programs, and physical education (PE) enhancements.
- Within the community-based setting, the *most prevalent* intervention types were individual supports and green space and parks.
- Regarding the home-based setting, the *most prevalent* intervention types were family-based physical activity interventions and screen time interventions.
- Although the majority of studies were child-focused, interventions were also parent/family, teacher, staff, and/or coach-focused to mediate change. Parent education, engagement, and involvement, as well as teacher trainings and professional development were used to incite behavior change and curricular enhancements.
- All included studies focused on healthy children and youth. For more information on physical activity research in CSHCN or children with disabilities, read the discussion section.
- Some interventions were specifically designed for girls or boys only. Many of the studies analyzed data and reported findings by gender and demonstrated differential impacts for girls and boys (e.g., MVPA did not increase as much for adolescent girls).
- The age range for the included studies was 4 to 18 years old.
 - Forty-four studies (48%) fit within the 6 through 11 age range (NPM 8.1).
 - Intervention types solely focused on children include active recess and homework or extra credit for PE class.
 - Nineteen studies (21%) fit within the 12 through 17 age range (NPM 8.2).
 - Self-regulation interventions were focused solely on adolescents.
 - Twenty-nine studies (31%) spanned both age ranges (both NPM 8.1 and NPM 8.2).
 - Many of the physical activity interventions were in combination with nutritional or obesity programs, and sometimes physical activity was a secondary outcome measure. For some studies, physical activity was used as the intervention itself for other goals, such as reducing obesity, increasing school achievement, and improving physical fitness.
 - Relatively small gains (1.07 to 10.8 additional minutes of MVPA) were seen based on the overall goal of achieving 60 minutes of MVPA daily for children and adolescents. Changes were not often seen

with regard to body mass index (BMI) or other anthropometric measures.

11. Schools were often used to implement physical activity and healthy eating interventions; however, the confines of the school structure could be limiting. Interventions were designed to fit within the school context, curriculum, and/or schedule.
12. The ability to compare studies was limited due to variability in the intervention designs, comparison groups, settings, and outcome measures. Although similar studies were grouped into clusters by intervention type, no two studies were the same with regards to design, target audience, and implementation. It was also difficult to figure out why a study with a similar strategy led to positive results while others reported mixed results. One possible explanation could be intervention fidelity and/or reach into the study population.
13. Of the 92 studies included in this evidence review:
 - a. The rating of *scientifically rigorous* was not given to any studies.
 - b. The rating of *moderate evidence* was given to 3 studies (3%).
 - c. The rating of *emerging evidence* was given to 67 studies (73%).
 - d. The rating of *mixed evidence* was given to 21 studies (23%).
 - e. The rating of *evidence against* was given to 1 study (1%).
14. Overall, the evidence base for the included physical activity interventions seems to be *emerging*. These studies are from the most recent literature (2018-2020) and include quite a number of pilot studies. Coupled with the solid evidence base described by RWJF and CDC, the scientific evidence for a number of the intervention types is notable and should be considered by Title V programs and partners seeking to support greater physical activity in childhood and adolescence.

Discussion and Implications

The studies included in this review provide further evidence about the effectiveness of physical activity interventions in schools, homes, and communities. Schools can and do play a powerful role in influencing students' physical activity behaviors and can inform decisions about program implementation. Comprehensive, multicomponent, school-based interventions that focus on physical activity, healthy eating, and well-being still dominate the literature and demonstrate efficacy. Researchers are continuing to study and refine targeted interventions, such as active recess,

physically active classrooms, PE enhancements, social networks/peer influences in schools, and extracurricular activities for physical activity, to infuse physical activity into the school day. Although there seem to be fewer home- and community-based studies, providing opportunities for physical activity in these settings is essential for a multilayered, ecological approach to healthy living. Parents and caregivers can decrease sedentary behaviors and encourage more free and structured play activities in the home. The built environment in communities can be altered to support greater opportunities for physical activity and active living.

Physical activity research and children with disabilities and special health care needs. The current review did not find any studies meeting the inclusion criteria that focused on or included CSHCN or children with disabilities. However, two recent scoping reviews described trends and recommendations for physical activity interventions and out-of-school time physical activity for children and youth with disabilities that are worth highlighting. Both scoping reviews found that the outcome measures of the reviewed studies focused primarily on the impact of physical activity on social skills, relationships, physical skill development, health measures, psychological well-being, or participation, but most did not focus on interventions to increase physical activity levels (Arbour-Nicitopoulos, 2018; Lai et al., 2020).

Physical activity in early childhood. Although this evidence review did not include the early childhood age range (birth through age 5), there are recommendations to include regular physical activity for young children as an important part of their health and development.

From Evidence to Action

This review is part of a series of scholarly works focused on each NPM to identify and describe evidence-based and informed strategies from peer-reviewed and grey literature. The 92 studies analyzed in this review provide an overview of the scientific literature that can inform Title V program design, implementation, and measurement to support physical activity in childhood and adolescence. If you are looking to build or strengthen physical activity initiatives in your state or jurisdiction, moving “from evidence to action” can seem daunting. The MCH Evidence Center has developed a framework, tips, and resources to help you through the process. An NPM 8: Physical Activity Toolkit is also available at <https://www.mchevidence.org/tools/npm/8-physical-activity.php>. Email us with questions, comments, and requests for technical assistance at mchevidence@ncemch.org.

REFERENCES

Arbour-Nicitopoulos KP, Grassmann V, Orr K, McPherson AC, Faulkner GE, Wright F. A scoping review of inclusive out-of-school time physical activity programs for children and youth with physical disabilities. *Adapted Physical Activity Quarterly*. 2018;35(1):111-138.

Lai B, Lee E, Wagatsuma M, Frey G, Stanish H, Jung T, Rimmer JH. Research trends and recommendations for physical activity interventions among children and youth with disabilities: A review of reviews. *Adapted Physical Activity Quarterly*. 2020 Apr 1;37(2):211-234.

U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services; 2018.