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Early Childhood Obesity Prevention in Rural West Virginia Extension's Role and Lessons Learned

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The Cooperative Extension system is uniquely positioned to lead rural community efforts to prevent obesity in early childhood. This article explores best practices in promoting healthy weights among young children and shares examples and resources relevant to Extension programming. The West Virginia (WV) Healthy Children Project aims to improve community, home, and early care and education (ECE) environments by promoting healthy eating, physical activity, outdoor play, and reduced screen time. This project primarily focuses on interventions with ECE providers serving 2-5-year-old children in three rural counties. Comprehensive assessments informed the interventions and guided Community Advisory Committees. ECE providers were trained in "I Am Moving, I Am Learning" (IMIL) and "Nutrition and Physical Activity Self-Assessment for Child Care" (Go NAP SACC) best practices and were supported with technical assistance and classroom resources. Garden-based learning, natural playscapes, painted playgrounds, and farm-to-ECE further enhanced the environments and experiences. Community leaders were engaged in advisory committees, transformative projects, and local family-focused activities. The efficacy of these practices was tracked using quantitative and qualitative evaluation strategies conducted throughout the project, including observations, ripple effects mapping, and questionnaires. This article describes the overall project strategies and reveals the lessons learned and the challenges encountered.

Keywords: early care and education, childhood obesity prevention, Extension model, healthy lifestyle, community engagement, parent engagement, IMIL, Go NAP SACC

Introduction

The mission of the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) is to "invest in and advance agricultural research, education, and extension

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to solve societal challenges” (USDA, 2018, p. 5). Obesity is a major societal challenge – one that Extension organizations may help to address. The Cooperative Extension (Extension) system is uniquely positioned to help lead community efforts to reduce obesity in young children. Extension has built a reputation on its ability to develop and foster state and community partnerships, implement research-informed strategies, and reach broad and diverse audiences. Together, these organizational qualities are invaluable in addressing chronic health issues. Child obesity is one example of a chronic health issue on which the Extension system is well-suited to focus its energies and resources. The purpose of this article is three-fold: (1) to discuss factors related to obesity trends, barriers, and facilitators; (2) to explore family, community, and early childhood solutions for the prevention of obesity; and (3) to share examples, resources, and experiences relevant to Extension programming for early childhood obesity prevention in rural communities.

Background

The costs and consequences of obesity are well-documented and include additional medical care, decreased work-related productivity, disability, premature death, and various social and psychological issues. The prevalence of adult obesity exceeds 30% in the United States, accounting for \$149.4 billion in medical costs at the national level (Kim & Basu, 2016). According to the 2015-16 U.S. Centers for Disease Control and Prevention’s (CDC) National Health statistic data, nearly 40% of adults were overweight or obese (CDC, 2017a). High obesity rates in U.S. adults impact individual health and our society at large. The CDC estimates that 71% of young people in the U.S. would not be able to join the military if they wanted to and that an unhealthy weight would be the cause of ineligibility in nearly one-third of possible recruits (CDC, 2017b). It is also evident that the proportion of U.S. children who are overweight or obese is alarmingly high, and this poses severe consequences for generations to come (Institute of Medicine, 2005).

Preschool-aged overweight or obese children (Body Mass Index greater than the 85th and 95th percentiles, respectively) are five times more likely to be overweight or obese as adolescents and adults (CDC, 2016a; Cunningham, Kramer, & Narayan, 2014). In addition, the prevalence of obesity in children tends to increase with age, which makes early childhood a critical age for obesity prevention efforts (Foster, Farragher, Parker, & Sosa, 2015). Establishing environments that promote healthy behaviors in early childhood may significantly reduce future obesity risk (Natale et al., 2013). Since more than half of U.S. children under age five spend significant time in nonparental childcare settings, this provides an opportunity to focus obesity prevention efforts in preschool and childcare environments (CDC, 2016b; Natale et al., 2013). Furthermore, health disparities between urban and rural environments and populations are well documented. For example, rural residents tend to eat diets higher in fat and calories, are less physically active, and engage in more screen time activities than urban residents (U.S. Department of Health and Human Services, 2015). Rural communities face a myriad of barriers to healthy lifestyles, such

as high poverty rates, less access to opportunities for physical activity and healthy eating, limited resources, and inadequate transportation. Extension systems need to consider these factors in addressing obesity in rural areas.

A review of the research on early childhood obesity prevention identified these six promising strategies (Benjamin Neelon, Østbye, Hales, Vaughn, & Ward, 2016; Hassink, 2017; Reynolds, Cotwright, Polhamus, Gertel-Rosenberg, & Chang, 2013): a

- Integrating obesity prevention curriculum on healthy eating, physical activity, and body image into the existing school curriculum;
- Including more sessions on physical activity and fundamental movement skills throughout the week as well as increasing ways for parents of young children to access this information;
- Improving the nutritional quality of foods made available to children;
- Creating an environment and culture that supports children eating nutritious foods and being active throughout each day;
- Providing support for teachers and other early care and education (ECE) staff to implement health promotion strategies and activities (e.g., professional development, capacity building activities); and
- Engaging parents to support activities in the home setting to encourage children to be more active, eat more nutritious foods, and spend less time in screen-based activities.

Research indicates the need and opportunity to prevent obesity during the first years of life (Natale et al., 2013). It is estimated that around 27% of 2-5 year-olds are overweight or obese, and more than 60% of children under six are in non-parental care on a weekly basis (Reynolds et al., 2013). These numbers illustrate the need for increased and improved early childhood education programs focused on obesity prevention (Reynolds et al., 2013). It is essential for schools, childcare settings, the healthcare system, and the broader community to provide programs that promote healthy behaviors in everyday practices in homes (Hassink, 2017). ECE settings often serve as “homes away from home” for children, and therefore, can be particularly influential in children’s lives (Reynolds et al., 2013).

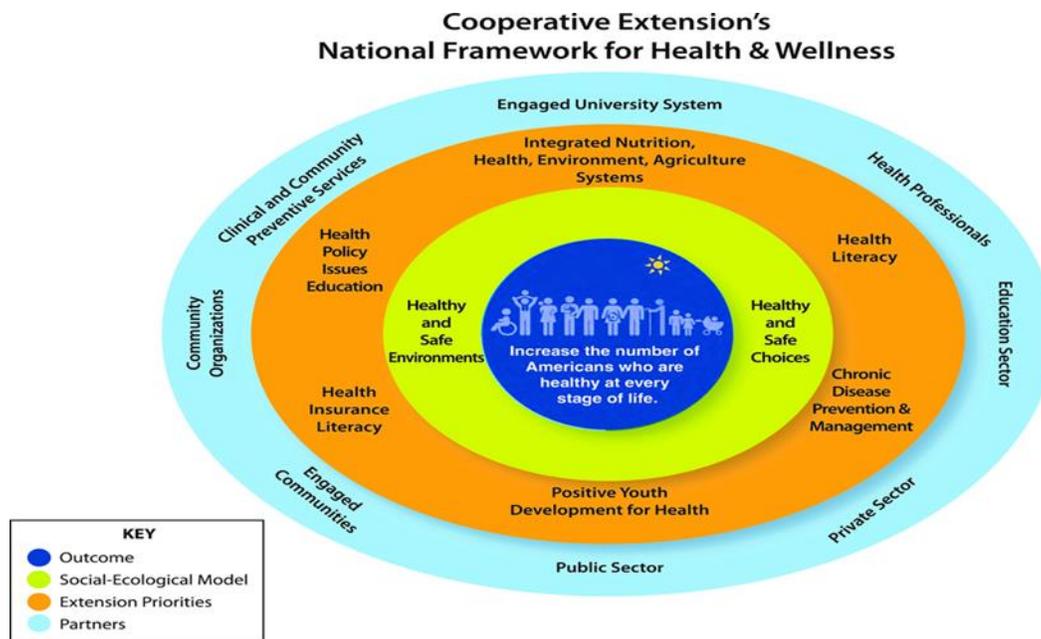
While there is limited rigorous research on interventions with young children, particularly with minority, limited resource, and rural children, expert recommendations consistently endorse comprehensive obesity prevention program supports that include healthy eating and physical activity behavioral components (Foster et al., 2015). There are no simple solutions, and experts advocate for additional research to precisely hone in on proven strategies. The Institute of Medicine (IOM) identified five critical focus areas for future research on childhood obesity prevention: (1) physical activity, (2) nutrition environments, (3) consistent messaging, (4) expanding stakeholder roles, and (5) making schools a focal point for obesity prevention (IOM, 2012a). There is a broad consensus that to successfully impact obesity rates, an ecological

approach that engages all sectors of society is needed (IOM, 2012a, 2012b; Khan et al., 2009). Responding to this research recommendation, federal legislation, funding, and programs increasingly emphasize public health approaches that involve policies, systems, and environmental changes.

Conceptual Frameworks

The Cooperative Extension's National Framework for Health and Wellness, as shown in Figure 1, visually depicts the complex interplay between individual, community, and societal factors (Braun et al., 2014). Based on the social-ecological model and systems thinking, this framework identifies six program priorities, outcome indicators, and potential partners. The center of the framework is the long-term goal of every Extension health program – to increase the number of Americans who are healthy at every stage of life. The framework's outer rings show the essential areas of knowledge and skill, and the systems that influence and support individuals, families, communities, and society at large to achieve this goal.

Figure 1. Cooperative Extension's National Framework for Health & Wellness



A second framework that is especially relevant is the Spectrum of Opportunities for Obesity Prevention in the Early Care and Education Setting, as shown in Figure 2. This framework shows the multitude of elements that may impact the weight status of children in ECE settings (Segal, Rayburn, & Martin, 2016).

Figure 2. The Spectrum of Opportunities Framework for State-Level Obesity Prevention Efforts Targeting the Early Care and Education Setting



The WV Healthy Children Project was informed by both frameworks which feature opportunities to impact childhood obesity and are closely aligned with Extension's organizational and programmatic strengths. Extension's strengths include a national network of respected and trained community educators and expertise in relevant areas of community engagement, such as nutrition, physical activity, parenting, and youth development. Moreover, Extension educators employ a comprehensive approach to engagement, leadership, and action. According to the IOM, solutions to help address the obesity epidemic must come from multiple sources (individuals, organizations, and agencies), involve multiple sectors at various levels, and incorporate multiple comprehensive prevention strategies (IOM, 2012a). Given the complex and pervasive nature of childhood obesity, it is imperative that Extension is at the table and accepts the challenge to actively engage in a broad range of obesity prevention efforts.

WV Healthy Children Project – An Overview

The West Virginia University (WV) Extension Service created the WV Healthy Children Project to help combat the staggering statistics for childhood obesity. Project counties were preselected

by the funding agency based on rurality and high (> 40%) adult obesity rates. These criteria for project participation were based on previous research that has shown certain characteristics of rural communities contribute to disparate levels of childhood and adult obesity. According to the U.S. Census Bureau Rurality Level, all three project counties are considered mostly rural, with 50-99.9% of the population living in rural areas in 2010 (Ratcliffe, Burd, Holder, & Fields, 2018). Using lessons learned from other WV ECE health initiatives, this project focuses on interventions with ECE providers in three rural counties. Providers serve 2-5-year-old children and include pre-K and Head Start teachers and providers in childcare centers, family childcare facilities, and homes.

Assessing the Community, Home, and Early Care and Education Environments

The project's first phase was a formative appraisal designed to determine community-level resources and to assess the current perceptions and environmental and behavioral influences related to early childhood obesity within the communities, ECE settings, and home environments. Twenty-five parents/guardians participated in three focus groups, and 37 community stakeholders from various community sectors participated in key informant interviews. Questions focused on the perceived prevalence of childhood obesity, as well as the related barriers and facilitators. Each was asked about their current and/or potential roles in promoting healthy lifestyles in young children. There was a consensus among focus group participants and key informants, revealing a dearth of healthy eating and physical activity opportunities for young children and a strong focus on sports activities, which are not appropriate for young children. Furthermore, cost, transportation, and distance were identified as significant barriers to healthy eating and physical activity. Results of the formative phase provided important insight and were used to shape the intervention approaches of the project.

ECE providers in the three counties were contacted with information about the project and were asked to participate. A total of 27 ECE providers participated, which included providers from 15 pre-K and Head Start classrooms, three childcare centers, three family childcare facilities, and six family childcare homes. The baseline for the project was established through observations conducted in classrooms and childcare centers using a validated tool called the Environment and Policy Assessment and Observation (EPAO), which entails a full day of direct observation and document review (Ward et al., 2008). In addition, each ECE provider completed a Nutrition and Physical Activity Self-Assessment for Child Care (Go NAP SACC) prior to intervention (The University of North Carolina at Chapel Hill, 2017). The Go NAP SACC tool includes four modules addressing Nutrition, Physical Activity, Outdoor Play & Learning, and Screen Time (Battista et al., 2014). Through the self-assessment process, ECE providers gained a better understanding of how their current practices compared with best practices. They developed an improvement plan, and these goals were tracked over time to determine goal attainment and barriers/facilitators.

Early Care and Education Interventions

After self-assessment, ECE providers attended an educational training on how to incorporate nutrition and physical activity best practices into their daily routines. Training components were derived from the nationally recognized initiatives “I Am Moving, I Am Learning (IMIL)” and “Go NAP SACC.” IMIL utilizes a health hero named CHOOSY (Choose **H**ealthy **O**ptions **O**ften and **S**tart **Y**oung) and music embedded with health messages. Upon completion of the training, all sites received music CDs and other health materials featuring CHOOSY. Training was offered to all participating ECE providers, and a refresher course was offered each year.

Support and technical assistance were provided monthly to each ECE provider by county-based Extension personnel. The focus of this technical assistance was to help ECE providers achieve their goals and strive toward best practices. WVU Extension mentors provided resources and ideas on ways to implement the ECE provider’s goals. In addition to the technical assistance, funds were allocated to ECE providers to purchase classroom and playground supplies to enhance their nutrition and physical activity environments. For example, ECE providers selected equipment for gross and fine motor development and creative play (e.g., tricycles, balance beams, and healthy food models). They were also provided with a variety of books and gardening supplies to start raised-bed and container gardens at their sites. Children helped plant the gardens and harvested the produce to create enthusiasm for tasting and eating fresh foods. The health hero, CHOOSY, periodically visited sites and engaged the children in physically active song and dance. Children had the opportunity to interact with CHOOSY, whom they learned about and saw in their classroom materials.

The project implemented various farm-to-ECE activities to encourage consumption of fresh produce and physical activity. Farmers markets were held at pre-K, Head Start, and childcare centers in the spring and fall months. In each project county, the pre-K and Head Start classrooms participated in field trips to local farms. During the summer months, boxes of fresh produce were provided monthly to childcare sites and individual families. Families also received steamer bags and healthy recipes with tips to prepare the produce.

Several surveys were completed periodically throughout the project to gain input and track progress. These included: (1) a survey of ECE provider knowledge of best practices, actual practices, and self-efficacy based on Alkon et al. (2014) and Gosliner et al. (2010); (2) a survey assessing current farm-to-ECE activities, perceived barriers, and current interest in farm-to-ECE activities; and (3) IMIL practices.

Family Engagement

Strong family engagement is vital in promoting children’s health and well-being. Therefore, an additional aim of this project was to actively engage families, reinforcing health messages the children received in the ECE setting within the home environment. ECE providers were given a

variety of health materials to send home on a regular basis to strengthen the health messages and activities that were taking place within the ECE setting. Take-home materials included a CHOOSY music CD, a CHOOSY magnet, a series of CHOOSY family activity handouts, and a CHOOSY magnetized refrigerator frame to display that week's family activity handout. A CHOOSY Healthy Habit System was pilot tested to encourage parents and children to engage in targeted behaviors at home. ECE providers challenged families to return information regarding the physical activity and healthy eating changes they were making at home. The children were then able to share what they were doing at home with the providers and other children in the classroom in a systematic way.

During the formative phase of the project, both parents and providers expressed concerns that transportation was the biggest barrier for families to attend events outside of the ECE day. The project initially intended to plan a series of family events as part of the parent engagement component. However, it was decided to instead partner with existing community events that were already frequented by families with young children. As part of these events, project staff facilitated physical activity and/or healthy eating activities with families and the health hero, CHOOSY.

A CHOOSY consistent messaging campaign was conducted throughout the three project counties to connect the ECE, home, and community environments. Three CHOOSY messages were disseminated throughout the county through a variety of media, including online social media sites, billboards, posters, brochures, newspaper advertisements, and grocery store cart ads. Messages encouraged families to be active together every day, eat a rainbow of fruits and vegetables, and include outdoor activities in family routines.

Community Engagement

One Community Advisory Committee (CAC) was formed in each county to advise the project team on strategies on how to best implement project components. The term "community" represents all rural communities within each county. Additional tasks for committee members were to provide oversight for the community mini-grant process, support project-related events, and advocate for and disseminate project information to their organizations and the community at large.

CACs were involved in three funding cycles of community mini-grants aimed to improve the nutrition and physical activity environments and practices of families with young children. Interested community organizations were informed about this opportunity to partner and submit a competitive application. CAC members reviewed applications and sent their recommendations to the project leaders. Twenty-eight projects in the three counties were selected for funding. A total of \$65,000 supported projects, such as outdoor pavilions, outdoor water fountains, natural learning environments, walking trails and signage, high tunnels for growing produce, and other

sustainable ventures. Each project organization was supported by a CAC mentor to help troubleshoot any problems and to ensure timely completion of all project components.

In addition to mini-grants, each county received supplies for “painted playgrounds.” CAC members selected sites to paint colorful and appealing stencil designs in various community locations (e.g., playgrounds and sidewalks) to encourage children to jump, hop, and have fun being physically active. Second, funding for one natural learning environment or playscape was provided to each county. Trainings were conducted for community members in each county by a company that specializes in planning and building natural learning environments. Once appropriate community sites were chosen, architectural plans were developed, and community build days were organized. Each community decided what elements to include in their natural learning environment. The painted playgrounds and natural playscapes are visible improvements and opportunities for families to be active in their communities for years to come.

Related to the community engagement component, a ripple effect mapping (REM) session was conducted. REM is a participatory evaluation methodology that uses appreciative inquiry, mind mapping, and qualitative analysis and helps to uncover intended and unintended project outcomes from the perspective of participants and stakeholders (Kollock, Flage, Chazdon, Paine, & Higgins, 2012). In this process, participants selected one or two partners and interviewed each other to identify (1) a highlight, achievement, or success related to the WV Healthy Children Project; (2) unexpected things that have happened as a result the project; and (3) connections with others, new and/or strengthened, resulting from the project. Participants reported to the larger group on what they learned in their partner interviews, and a ripple map was created using xMind software. The final step in the REM process involved the project staff, evaluators, and Extension educators determining which components of the Extension Health and Wellness Framework were reportedly addressed by the project. Each ripple was linked with at least one component from the social-ecological models, Extension priorities, and partner list. Two Extension priorities stood out: (1) positive youth development for health and (2) integrated nutrition, health, environment, and agriculture systems.

In the final year of project funding, a project sustainability training was conducted in all three project counties. The purpose of these trainings was to revisit the accomplishments that each community achieved and to develop a plan for community ownership for the continuation and expansion of project activities. Community members were asked to take leadership roles in these identified activities and to develop a plan to keep the momentum moving forward.

Lessons Learned

Early childhood obesity prevention is a complex issue that WVU Extension has worked to improve. This project strived to encompass all sectors of the rural communities using the conceptual frameworks, as well as the five critical areas identified by the IOM: (1) physical activity; (2) nutrition environments; (3) consistent messaging; (4) expanding stakeholder roles;

and (5) making schools a focal point for obesity prevention (IOM, 2012a). Evidence-informed tools, resources, and strategies were incorporated to help build a successful model (Nemours Children's Health System, 2016). While this was not a research project, the project team offers the following lessons learned to other Extension systems that are seeking to improve early childhood obesity prevention initiatives.

- Cultivate the Community's Support

Community buy-in is essential to creating community change. Connections with schools, ECE providers, and a broad array of community organizations evolved into relationships. These relationships facilitated stronger program support and constructive feedback and helped promote programs within the communities. Some stakeholders who initially did not recognize their role or influence on young children's health and obesity prevention realized this through their involvement in advisory committees, mini-grants, and project activities.

- Mentor Community Champions

It was evident from the beginning that each county needed "champions" to explain the various project components and to build the trust of community members. The ECE providers and the Extension educators served as champions and were crucial to successful implementation. Extension educators promoted the project and fostered community collaborations. ECE providers were key in gaining the trust of parents and children so they would more readily engage in activities and behaviors that were at first unfamiliar to them.

- Anticipate Turnover

When working on multi-year, multi-county, and multi-faceted projects, personnel turnover is not unusual. Throughout the 4-year project, there was turnover at all levels (investigators, project staff, county staff, and ECE providers) that led to delays in hiring replacements, training needs, and communication issues. However, this issue was addressed with specific plans to keep the project moving forward. Project personnel from neighboring counties were able to assist with project planning, trainings and implementation, and ECE training was held each year so that new providers were included in the project.

- Meet ECE Providers Where They Are to Create Win-Win Solutions

Initially, some providers were hesitant to set goals to incorporate best practices for nutrition, physical activity, outdoor play, and screen time because they thought it might be a burden to their already hectic schedules and overwhelming

responsibilities. Extension educators worked with ECE providers on their goals. Educators were creative in suggesting ways to incorporate health messages and activities into existing lesson plans and routines. This seemed to relieve providers' initial reluctance. Providers reported that the project's physical activity and nutrition resources were helpful in goal attainment. ECE providers offered feedback and input, which further improved their level of engagement and excitement for the project.

- Get to Know Parents

Parent engagement was a persistent barrier, affecting participation in community events and evaluation components. Lack of parent engagement was not unique to this project, as providers reported that few parents typically respond to their requests. The project team found that partnering with providers and familiar community groups and activities led to greater parent engagement in some cases. The project team often heard from parents that they could not participate in school and community events due to transportation issues. These issues were evident when a series of planned evening Family Fun Events resulted in low participation in all three counties. One county found closer collaboration with school- and community-based events helped reduce transportation issues so more families could participate. Instead of conducting independent project events, the team contributed to existing, well-established events.

- Be Visible

Increasing the project's visibility was important in connecting with parents. Strategies included take-home CHOOSY magnets and family activities, social media, improvements at playgrounds and parks, and consistent health messages in grocery stores and places frequented by families with young children.

- Make Friends with Local Farmers

Limited access to fresh produce was a challenge, particularly for the childcare centers, facilities, and in-home providers. Because these providers operate with limited staff and resources, trips to the grocery store are not always possible, and healthy options in small, rural communities are often limited. To reduce this barrier, local farmers were engaged and offered fresh produce boxes with recipes to families and childcare facilities throughout the growing season. The boxes offered increased access to fruits and vegetables for providers and families.

- Embrace Your Own Learning Curve

Extension educators broadened their own skills beyond traditional direct education roles to include promoting physical activity opportunities and ECE technical

assistance. Comprehensive, multi-level strategies required the team to understand complex community cultures and reach beyond their comfort zones in stimulating policy, systems, and environmental changes.

This project created a “learning laboratory” for the project team and all partners to continually learn and grow together.

Conclusion

Successful community-based prevention models are needed to accelerate the progress in childhood obesity prevention. Combining elements of the Cooperative Extension’s National Framework for Health and Wellness with CDC’s Spectrum of Opportunities for Obesity Prevention in Early Child Care Settings served as a valuable starting point for conceptualizing a comprehensive model for changes at the individual, family, organization, and community levels. Research provides additional direction in identifying promising interventions. A vast amount of research indicates that ECE settings can significantly affect children’s physical activity, healthy eating, and screen time habits, yet many rural childcare centers do not have resources to make changes in these areas. Increasingly, state agencies have developed policies and systems for obesity prevention in ECE settings, and broader community support is clearly needed. Community collaborations focused on early childhood obesity prevention can help to expand project reach by leveraging and pooling resources. Additionally, evidence-informed tools, such as IMIL, Go NAP SACC, and EPAO offer consistency with training and messaging, as well as with measuring outcomes. This project may be the first of its kind to employ this combination of quality tools. The WV Healthy Children Project serves as an example of how one state Extension system brought together the necessary components to lead the way in making positive changes in early childcare settings in rural communities.

References

- Alkon, A., Crowley, A. A., Neelon, S. E., Hill, S., Pan, Y., Nguyen, V., . . . Kotch, J. B. (2014). Nutrition and physical activity randomized control trial in child care centers improves knowledge, policies, and children's body mass index. *BMC Public Health, 14*, 215. doi:10.1186/1471-2458-14-215
- Battista, R. A., Oakley, H., Weddell, M. S., Mudd, L. M., Greene, J. B., & West, S. T. (2014). Improving the physical activity and nutrition environment through self-assessment (NAP SACC) in rural area child care centers in North Carolina. *Preventive Medicine, 67*(Supplement 1), S10–S16. doi:10.1016/j.ypmed.2014.01.022
- Benjamin Neelon, S. E., Østbye, T., Hales, D., Vaughn, A., & Ward, D. S. (2016). Preventing childhood obesity in early care and education settings: lessons from two intervention studies. *Child: Care, Health and Development, 42*(3), 351–358. doi:10.1111/cch.12329

- Braun, B., Bruns, K., Cronk, L., Kirk Fox, L., Koukel, S., Le Menestrel, S., . . . Warren, T. (2014). *Cooperative Extension's National Framework for Health and Wellness*. Retrieved from <https://nifa.usda.gov/resource/national-framework-health-and-wellness>
- Centers for Disease Control and Prevention. (2016a, October 20). *Defining childhood obesity* [Online post]. Retrieved from <https://www.cdc.gov/obesity/childhood/defining.html>
- Centers for Disease Control and Prevention. (2016b). *Early care and education state indicator report, 2016*. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.
- Centers for Disease Control and Prevention. (2017a). *Selected health conditions and risk factors, by age: United States, selected years 1988–1994 through 2015–2016*. [Table]. Retrieved from <https://www.cdc.gov/nchs/fastats/obesity-overweight.htm>
- Centers for Disease Control and Prevention. (2017b, May). *Unfit to serve-obesity is impacting national security* [Infographic]. Retrieved from <https://www.cdc.gov/physicalactivity/resources/factsheets.html>
- Cunningham, S. A., Kramer, M. R., & Narayan, K. M. (2014). Incidence of childhood obesity in the United States. *The New England Journal of Medicine*, *370*(5), 403–411. doi:10.1056/NEJMoa1309753
- Foster, B., Farragher, J., Parker, P., & Sosa, E. (2015). Treatment interventions for early childhood obesity: A systematic review. *Academic Pediatrics*, *15*(4), 353–361. doi:10.1016/j.acap.2015.04.037
- Foster, J. S., Contreras, D., Gold, A., Keim, A., Oscarson, R., Peters, P., . . . Mobley, A.R. (2015). Evaluation of nutrition and physical activity policies and practices in child care centers within rural communities. *Childhood Obesity (print)*, *11*(5), 506–512. doi:10.1089/chi.2015.0030
- Gosliner, W. A., James, P., Yancey, A. K., Ritchie, L., Studer, N., & Crawford, P. B. (2010). Impact of a worksite wellness program on the nutrition and physical activity environment of child care centers. *American Journal of Health Promotion*, *24*(3), 186–189. doi:10.4278/ajhp.08022719
- Hassink, S. G. (2017). Early child care and education: A key component of obesity prevention in infancy. *Pediatrics*, *140*(6), e20172846. doi:10.1542/peds.2017-2846
- Institute of Medicine (U.S.) Committee on Prevention of Obesity in Children and Youth, Koplan, J., Liverman, C., & Kraak, V. (2005). *Preventing childhood obesity: Health in the balance*. Washington, DC: The National Academies Press.
- Institute of Medicine (U.S.) Committee on Accelerating Progress in Obesity Prevention, & Glickman, D. (2012a). *Accelerating progress in obesity prevention: Solving the weight of the nation*. Washington, DC: The National Academies Press.
- Institute of Medicine (U.S.) Committee on Accelerating Progress in Obesity Prevention, & Workshop on Measurement Strategies for Accelerating Progress in Obesity Prevention (2011: Irvine, Calif.). (2012b). *Measuring progress in obesity prevention: Workshop report*. Washington, DC: The National Academies Press.

- Khan, L.K., Sobush, K., Keener, D., Goodman, K., Lowry, A., & Kakietek, J. (2009). Recommended community strategies and measurements to prevent obesity in the United States. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 58(RR07), 1–26. Retrieved from <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm>
- Kim, D. D., & Basu, A. (2016). Estimating the medical care costs of obesity in the United States: Systematic review, meta-analysis, and empirical analysis. *Value in Health*, 19(5), 602–613. doi:10.1016/j.jval.2016.02.008
- Kollock, D., Flage, L., Chazdon, S., Paine, N., & Higgins, L. (2012). Ripple effect mapping: A radiant way to capture program impact. *Journal of Extension*, 50(5), Article 5TOT6. Retrieved from <https://www.joe.org/joe/2012october/tt6.php>
- Natale, R., Scott, S. H., Messiah, S. E., Schrack, M. M., Uhlhorn, S. B., & Delamater, A. (2013). Design and methods for evaluating an early childhood obesity prevention program in the childcare center setting. *BMC Public Health*, 13, 78. doi:10.1186/1471-2458-13-78
- Nemours Children's Health System. (2016). *State quality rating and improvement systems: Strategies to support achievement of healthy eating and physical activity practices in early care and education settings*. Washington, DC: Nemours National Office of Policy & Prevention.
- Ratcliffe, M., Burd, C., Holder, K., & Fields, A. (2016). *Defining rural at the U.S. Census Bureau*. Washington, DC: U.S. Census Bureau. Retrieved from https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf
- Reynolds, M. A., Cotwright, C. J., Polhamus, B., Gertel-Rosenberg, A., & Chang, D. (2013). Obesity prevention in the early care and education setting: Successful initiatives across a spectrum of opportunities. *The Journal of Law, Medicine & Ethics*, 41(2_suppl), 8–18. doi:10.1111/jlme.12104
- Segal, L., Rayburn, J., & Martin, A. (2016). The state of obesity: Better policies for a healthier America. *Trust in America's Health*. Retrieved from <http://www.StateofObesity.org>
- The University of North Carolina at Chapel Hill. (2017). *NEW GO NAP SACC SELF-ASSESSMENT NOW AVAILABLE!* Retrieved from <https://gonapsacc.org/resources/news-updates/new-go-nap-sacc-self-assessment-now-available>
- U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. (2015). *The health and well-being of children in rural areas: A portrait of the nation, 2011-2012*. Rockville, MD: U.S. Department of Health and Human Services. Retrieved from https://mchb.hrsa.gov/nsch/2011-12/rural-health/pdf/rh_2015_book.pdf
- U.S. Department of Agriculture, National Institute of Food and Agriculture. (2018). *Strategic plan FY 2014-FY 2018*. Retrieved from <https://www.nifa.usda.gov/resource/nifa-strategic-plan-fy2014-fy2018>

Ward, D., Hales, D., Haverly, K., Marks, J., Benjamin, S., Ball, S., & Trost, S. (2008). An instrument to assess the obesogenic environment of child care centers. *American Journal of Health Behavior*, 32(4), 380–386. doi:10.5555/ajhb.2008.32.4.380

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