Prevention of Pediatric Overweight and Obesity: Position of the Academy of Nutrition and Dietetics Based on an Umbrella Review of Systematic Reviews

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ABSTRACT

This Academy of Nutrition and Dietetics Position Paper reports current evidence on pediatric overweight and obesity prevention interventions and discusses implications for registered dietitian nutritionists (RDNs). An overview of current systematic reviews provided evidence-based results from a range of nutrition interventions according to developmental age group (ages 2 to 5, 6 to 12, and 13 to 17 years). Twenty-one current systematic reviews of nutrition interventions demonstrated a beneficial effect of nutrition and physical activity interventions on body mass index measures and no adverse events were identified. RDNs impart nutrition expertise in a wide range of settings to provide comprehensive care for children and adolescents as their nutrition and developmental needs change over time. This Position Paper outlines the current roles of, and proposed directions for, RDNs engaged in pediatric overweight and obesity prevention. Prevention of pediatric overweight and obesity requires comprehensive strategies ranging from policy-level to individual-level interventions in settings that will have the most beneficial impact for children according to their developmental stage. This Position Paper advocates for increased availability of nutrition and food access programs and interventions to reduce risk of pediatric obesity and associated adverse health outcomes both now and for future generations.

J Acad Nutr Diet. 2022;122(2):410-423.

Supplementary materials: *Figure 1 is available at www.jandonline.org*

PEDIATRIC OVERWEIGHT AND obesity, defined as body mass index (BMI)-for-age at the 85th and 95th percentiles or greater,[1] is a complex and multifaceted health concern that continues to have a considerable effect on children in the United States. From 2017 to 2018, the rate of pediatric obesity in the United States was 19.3%. Rates were 13.4% among 2- to 5-year-olds, 20.3% among 6- to 11-year-olds, and 21.2% among 12- to 19-year-olds.[2] Behaviors associated with weight status, such as dietary intake and physical activity, tend to track from childhood to adulthood.[3] Early identification and screening for pediatric overweight and obesity can help lead to early interventions and decrease associated medical comorbidities.[4] Therefore, interventions to prevent pediatric obesity are crucial for securing public health now and in the future.

Techniques to prevent pediatric overweight and obesity must include strategies that influence the child's family, school or child-care center, behavior, and greater environment.[5] In 2013 and 2014, the Academy of Nutrition and Dietetics (Academy) published 2 Position Papers to inform and support approaches to address prevention of pediatric overweight and obesity.[6,7] These Position Papers have since expired, necessitating re-examination of current questions and controversies, as well as current evidence, on pediatric overweight and obesity prevention.

POSITION FOCUS

The objective of this Position Paper was to examine current evidence on interventions to prevent pediatric overweight or obesity and to inform practitioners on topics important to practice. Subtopics discussed include:

- efficacy of nutrition interventions to prevent pediatric overweight and obesity;
- prevention interventions in the home and family setting;
- prevention interventions in the health care setting;
- prevention interventions in the school setting;
- prevention interventions in the community setting;
- electronic media, marketing, and device exposures and interventions;
- considerations for nutrition interventions delivered to specific

POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics that prevention of pediatric overweight and obesity requires multilevel, multicomponent, and culturally appropriate interventions with family involvement to improve and sustain intake of healthy dietary patterns and physical activity in a developmentally appropriate manner throughout childhood and adolescence. Registered dietitian nutritionists are uniquely qualified to advocate for and deliver nutrition counseling in child-based settings; develop and deliver theory-based nutrition education programs; and implement environmental and policy changes to improve access to healthy foods.

https://doi.org/10.1016/j.jand.2021.11.003

groups and determinants of health;
- federal food assistance programs;
- food access programs
- dietary patterns and quality
- reimbursement for pediatric obesity prevention interventions; and
- implications of the COVID-19 pandemic on pediatric obesity prevention.

POSITION PAPER DEVELOPMENT PROCESS

Current Academy Position Papers are based on systematic reviews.[8] A recent scoping review of systematic reviews identified an abundance of current, relevant systematic reviews addressing a wide range of interventions to prevent pediatric overweight and obesity.[9] Therefore, an umbrella review, also termed an *overview of reviews*, was conducted to address important questions for RDNs working with the pediatric population. This umbrella review aligned with the methods outlined by the Cochrane Collaboration.[10] A full description of methods for this umbrella review can be found on the Evidence Analysis Library website.[11]

Systematic reviews were eligible for inclusion if they searched at least 2 databases, assessed risk of bias of their included primary studies, and were published between January 2017 and February 2021. Certainty of evidence (level of confidence in evidence) was determined using the Grading of Recommendations Assessment, Development and Evaluation method.[12] This certainty of evidence included both the items considered in a traditional systematic review (ie, number and types of studies included, consistency between studies, and precision), as well as the risk of bias assessment of the systematic review itself, as determined using the AMSTAR 2 tool.[13] Evidence was graded as "HIGH," "MODERATE," "LOW," or "VERY LOW."[12] Systematic reviews that assessed certainty of evidence were prioritized over those that did not. For each section, a conclusion statement summarizing the evidence is presented in bold text. Implications for practitioners were written by expert panel members and supported by the 2015 Pediatric Nutrition Standards of Practice and Standards of Professional Performance[14] (Figure 1, available at www.jandonline.org), which are consensus standards for competent, proficient, and expert RDNs. The Standards of Practice and Standards of Professional Performance for pediatric nutrition are currently being updated. This Position Paper was peer-reviewed externally by Academy members and internally by Academy teams and was approved by the Academy's Council on Research.

Efficacy of Nutrition Interventions to Prevent Pediatric Overweight and Obesity

Three systematic reviews were analyzed to examine the efficacy of nutrition interventions to prevent pediatric overweight and obesity.[15-17] Nutrition and physical activity interventions to prevent pediatric overweight or obesity resulted in a slight reduction in BMI *z* score for participants younger than 18 years.[15,16] Interventions were more effective for individuals 12 years and younger, and evidence for interventions targeting adolescents aged 13 through 18 years was highly variable.[15] Obesity prevention programs that were multicomponent, multilevel, and/or in multiple settings reduced overweight and obesity prevalence.[17] Evidence certainty was MODERATE for children aged 0 through 5 years and LOW for children aged 6 to 12 years and 13 to 18 years. Most included interventions focused on individual-level interventions rather than on "upstream" determinants, such as infrastructure, environment, or policy, and this trend has not changed over time.[18]

Implication for Practitioners. RDNs provide nutrition education as an essential part of pediatric obesity prevention interventions.[14] Pediatric nutrition education programs should involve RDNs as experts in providing accurate nutrition advice and input; however, behavioral studies have shown that knowledge, although necessary, is not sufficient to produce robust behavioral changes.[19] Thus, nutrition education programs should include behaviorally based strategies that are planned using systematic approaches,[14] such as Intervention Mapping or the Behavioral Change Technique Taxonomy.[20-22] RDNs who develop culturally and developmentally appropriate nutrition education programs for obesity prevention are trained in behavioral sciences or work in collaboration with behavioral scientists. For example, RDNs who develop these programs collaborate with experts in physical activity or expand their own training in interventions to increase physical activity and improve built environments that lead to more physical activity for children.[14,23] These collaborations can lead to innovative activities and a coordinated programmatic approach that reinforces recommended behaviors[24,25] across several components, levels, or settings, as seen in the obesity prevention effects obtained in highly integrated programs.[17]

The certainty of evidence was higher among preschool children aged 0 through 5 years compared with those in elementary schools (aged 6 through 12 years) or secondary schools (aged 13 through 18 years).[11] In addition, most interventions tended to focus on individual-level behaviors rather than upstream environmental factors or social determinants of health,[18,26] which is antithetical to the premise that obesity is a complex disease. Most of the nutrition education interventions for children aged 0 through 5 years are targeted primarily at the parents rather than the children, as at that age, the parents are the primary gatekeepers for children's diets and social influences.[27,28] As children grow and gain more autonomy, environmental factors outside the home become more prominent influences on diet.[28] For example, older children might use spending money for snacks at retail food outlets or have more choices at the cafeteria. These findings suggest that RDNs examine environmental influences as part of a socioecological approach or upstream social determinants of health, and target these factors through nutrition education interventions.[29]

Importantly, review of the literature found no adverse effects from nutrition education programs, in terms of depression, weight concern, body image, or injury.[15] RDNs should not refrain from implementing nutrition education programs due to concerns about harm to children, specifically related to the development of disordered eating patterns.[30] Nevertheless, it is important to ensure that nutrition

messages reflect the latest scientific evidence and focus on behavioral strategies that encourage development of healthful eating patterns.[14]

Prevention Interventions in the Home and Family Setting

Two systematic reviews were analyzed that examined the effect of interventions to prevent pediatric overweight or obesity in the home and family settings on BMI measures.[15,31] Nutrition and physical activity interventions in the home setting reduced BMI substantially in children aged 0 through 5 years.[15] However, evidence with less certainty described no effect on the outcome of BMI *z* score.[15] Limited evidence suggests no overall effect of home-based nutrition and physical activity interventions in children and adolescents aged 6 through 18 years.[15] Evidence certainty was MODERATE for children aged 5 years and younger and LOW for older children. Morgan and colleagues[31] found no differences in outcomes according to whether caregivers were involved in at least 1 aspect of the intervention.

Implication for Practitioners. Early interventions to improve child BMI measures through diet and physical activity modifications in the home setting may be effective in preschool-aged children, but have been shown to have little efficacy in older children.[11] There is a lack of uniformity in nutrition and physical activity interventions, making comparisons across studies difficult. Greater impacts on BMI in children aged 0 through 5 years were seen when focusing on dietary behaviors and physical activity in combination.[15]

RDNs work with families to help shape food behaviors and preferences early. Utilization of a family approach to obesity prevention can help parents to role model health-promoting nutrition and physical activity behaviors to meet recommended goals.[14,24,25,32] Parents can involve children in food shopping and meal preparation at a young age and can give children more responsibility and autonomy for cooking as they get older. Participating in cooking classes, especially with virtual opportunities, may help families develop skills to incorporate more dietary variety. RDNs help families implement routines and rules around consistent family meals and removing electronic devices (eg, televisions, phones, and tablets) during mealtimes, both at home and when eating away from home.[14] It is crucial that RDNs connect with parents or other primary caregivers, perhaps through strategies using technology (eg, digital/eHealth or mobile/mHealth[33]) or by partnering with nonprofit or food companies and retailers.[14]

The certainty of evidence was higher for children aged 5 years and younger compared with older children.[11] Efficacy may wane as children get older and are increasingly influenced by peers and the environment outside of the home and family. These findings demonstrate that interventions in one setting may not be as efficacious, and more comprehensive interventions (community-, environmental-, and policy-level) are needed and especially relevant for school-aged children. RDNs work with interdisciplinary teams to implement more comprehensive interventions that include the home and family setting as one component of the intervention.[14]

Prevention Interventions in the Health Care Setting

Three systematic reviews were analyzed to determine the effect of pediatric nutrition interventions delivered in the health care setting on BMI measures.[15,34,35] Nutrition and physical activity interventions delivered in the health care setting reduced BMI *z* scores in children aged 0 through 5 years.[15,34] Results in older children and adolescents were lacking[15] and more heterogeneous, with some research suggesting a beneficial effect and some demonstrating no effect on BMI *z* scores and percentiles.[35] There was little to no evidence available reporting the effects of health care obesity prevention interventions on the prevalence of overweight or obesity. Certainty of evidence was LOW.

Implication for Practitioners. RDNs play an integral role in pediatric disease prevention in the primary health care setting, particularly early in life. RDNs impact pediatric obesity in the primary care setting both by working to educate other health care professionals and by connecting directly with clients and families during regularly scheduled appointments.[14] RDNs participate in interdisciplinary education to provide other health care practitioners with dietetics education.[14] RDNs should educate other health care professionals about the importance of establishing healthy eating habits, even for pediatric clients who have normal weight status. Providers, including physicians and nurses, should pay close attention to children's growth curves to ensure age-appropriate growth trajectories, and should have a prescribed system for referring pediatric clients who are at risk of overweight or obesity to an RDN. RDNs engage primary care providers to provide opportunities for families that can improve pediatric obesity prevention, such as nutrition counseling, cooking demonstrations, or healthy snacks available in the office.[14] Local dietetics associations can engage primary care providers who may not be offering dietetics services to educate them on the benefits of dietetics services and provide resources to connect with RDNs.

In addition to working with parents in the home setting, RDNs work in clinical settings to prevent pediatric overweight and obesity during primary care visits. RDNs use multicomponent parent education interventions to educate on appropriate nutrition and physical activity for their children based on their age and weight.[14,24,25] In Quattrin and colleagues,[36] children and parents were provided education during 10 sessions of 60 minutes over 6 months. Compared with the control group, children in the intervention group had lower risk of obesity and decreased BMI *z* scores, and parents experienced a reduction in BMI, although *education provider* was not well-defined. Thus, nutrition and physical activity interventions provided in the primary care setting should be implemented for children who are at risk of overweight or obesity.[36]

Prevention Interventions in the School Setting

Eight systematic reviews were analyzed to determine the effect of nutrition interventions or exposures to prevent pediatric overweight or

obesity in school settings. More detail can be found on the Evidence Analysis Library website.[11,15,37-43] Nutrition and physical activity interventions to prevent pediatric obesity resulted in a nonsignificant reduction in BMI measures for children in the child-care or preschool settings.[15] Interventions in school settings resulted in a significant reduction in BMI *z* score and obesity prevalence for children aged 6 through 12 years.[15] There was no overall effect of school-based interventions in adolescents aged 13 through 18 years on BMI outcomes, but results were heterogeneous.[15,41] Multicomponent health promotion interventions,[40] school meal and fruit and vegetable interventions,[43] implementing policies for reducing competitive snacks and beverages,[43] and improving access to water[43] decreased odds of overweight and obesity. Certainty of evidence was MODERATE.

Implication for Practitioners. The school setting is an important site for obesity prevention[11] for the following reasons: children spend a significant amount of their waking hours at schools, opportunities for provision of healthy meals[44-47] and physical activity[48] are inherent within schools, most schools require nutrition education,[46,47,49,50] and school policies can set norms and attitudes that shape dietary intake and physical activity.[47,51] Thus, school obesity prevention interventions often include not only individual-level interventions aimed at the students, but also work at the environmental (eg, provision of healthful food choices) and policy (eg, policies for selling foods as fundraisers) levels, as seen in coordinated school health or Whole School, Whole Community, Whole Child approaches.[52] The role of RDNs in schools and child nutrition programs is essential, and includes the provision of school meals; nutrition initiatives, such as school gardens, nutrition education and promotion; and development and implementation of local school wellness policies, as well as advocating for evidence-based school policies at the national, state, and local levels.[14,46,47]

School Child Nutrition Programs[46,53] are an essential part of obesity prevention efforts at the school level, especially for low-income children,[54] and several of these interventions[43] (eg, policies for reducing competitive snacks and beverages) were found to be efficacious.[11] Some of the most significant pediatric obesity prevention policies have been implemented through the Child Nutrition Reauthorization (CNR), the most recent of which is the Healthy, Hunger-Free Kids Act of 2010,[55] which introduced sweeping changes in terms of provision of healthier school meals, healthier meals for early care and education (ECE), and school policies. Unfortunately, some of the provisions of the Healthy, Hunger-Free Kids Act were weakened during the past few years,[56] despite recent findings that the Healthy, Hunger-Free Kids Act implementation has been associated with lower risk of obesity among children in poverty.[54] CNR, by law, should occur every 5 years, but has still not been renewed as of September 2021. RDNs play a significant role in advocating for strong, science-based recommendations for CNR, and then in implementing these CNR guidelines.[14] Implementation science research can be useful in examining what strategies can be successful in implementation of CNR provisions, as well as dissemination of evidence-based programs.[57] To date, implementation studies have not been widely studied in the school setting.

Interventions conducted in the ECE or child-care setting did not achieve the same results as those conducted in schools,[11] although children in child-care settings still have high prevalence of obesity. This presents an opportunity for RDNs to develop and implement innovative programs through ECE settings, such as Head Start, and private child-care facilities using more rigorous study designs. The ECE setting can be challenging due to the diversity of programs, but regardless of setting, a strong parent component is required.

As noted in other reviews, school studies are heterogeneous, and most have been conducted in elementary school settings. Innovative programs for older children and high school students, especially, are needed. Programs for teens should emphasize appropriate developmental approaches, which highlight growing independence and peer influences, as well as addressing environmental and social determinants of health.[14,58] In addition, social media or eHealth/mHealth interventions can be relevant in this age group (see Electronic Media Marketing and Device Exposures and Interventions section).

Prevention Interventions in the Community Setting

Two systematic reviews were analyzed to examine the effect of pediatric overweight and obesity prevention interventions in the community setting on BMI measures.[15,39] Nutrition and physical activity interventions in the community setting resulted in decreased BMI, but not BMI *z* score, in children aged 0 through 5 years.[15] Although there was no effect of community interventions on BMI outcomes in children aged 6 through 12 years,[15] limited evidence demonstrated that a multisetting intervention including community components reduced prevalence of overweight and obesity.[39] There was no evidence available targeting adolescents aged 13 through 18 years.[15] Evidence certainty was LOW.

Systematic reviews examining cohort studies may inform etiology of pediatric overweight or obesity. A systematic review by Narciso and colleagues[59] found that a greater quantity of limited-service restaurants and of more types of food outlets was positively associated with BMI and greater odds of obesity 3 years later in adolescents, and the presence of neighborhood supermarkets had a longitudinal association with decreased BMI. However, other systematic reviews found no association between full-service restaurants[60] or grocery stores[61] and BMI or obesity outcomes in participants younger than 18 years.

Implication for Practitioners. Overall, few obesity prevention studies have been conducted in the community, aside from school-based studies.[11] The foci of community interventions are more influential for parents with young children because parents are the gatekeepers for diet and physical activity opportunities for preschool-aged children. RDNs implement programs and strategies aimed at preschool-aged children in community settings; these interventions can include addressing food marketing, taxes for sugary

beverages, or increased availability of farmer's markets.[29,62]

In terms of elementary school–aged children, the studies reviewed showed little effect of community interventions on obesity prevention, likely due to the heterogeneity and lack of specificity of the interventions.[11] Elementary school–aged children do not regularly engage with most targets of community-based interventions, such as neighborhood food stores, supermarkets, and restaurants; most parents do grocery shopping and select venues for eating away from home. These results present an opportunity for the RDN to develop community-based interventions that target parents but focus specifically on child diet or physical activity (eg, a grocery store campaign aimed at buying healthier foods for their children).[14] Recent efforts to alter placement of foods in grocery stores[63,64] or to change the beverage offerings in kids' meals in restaurants[65] are examples of potential interventions that need to be evaluated in rigorous controlled trials. Community interventions can reinforce school-based interventions in this age group, so RDNs working in school settings may want to extend programmatic changes into the community environment.[66] Multilevel, multicomponent intervention strategies are important in community-based obesity prevention work.[66,67]

Very little work has been done in the community setting for adolescents aged 13 through 18 years, which is a major gap in the literature.[11,15] Overall, rigorously designed community-based interventions are difficult to conduct because of the variability in identification of discrete community areas for intervention, risks of contamination, limited intervention strategies that can be implemented within proprietary establishments, and the expense of intervention strategies and outcome measurement for communities rather than individuals. Healthy Eating Research[68] has supported research on policies, systems, and environments related to healthy eating that has led to a growing base of evidence for community-focused interventions for children, particularly preschool-aged children. RDNs should continue to build on this evidence to design more rigorous trials to evaluate the effectiveness of pediatric obesity prevention efforts in the community setting, as well as to further define appropriate determinants of pediatric obesity in the community for different age groups.[14]

Because the success of pediatric obesity prevention programs and initiatives conducted in the community is associated with robust implementation across multiple settings,[66] RDNs engaged in school-based, health care, or community programs seek to engage partners in their efforts. Expanding community networks and working with organizations with similar child health objectives is essential to maximizing the impact of these programs.

Electronic Media, Marketing, and Device Exposures and Interventions

Three systematic reviews examined the effect of media exposure on outcomes of interest.[69-71] Increased exposure to a screen[70] and fewer caregiver rules[70] on screen time may result in greater risk of overweight or obesity in children aged 6 through 12 years. Mobile phone interventions reduced BMI in adolescents, but results were not significant.[71] Results were not significant in any subgroup analysis, including for interventions of health apps only, text messages, or long- or short-term interventions. In pediatric participants aged 5 through 19 years, results from studies examining active video games were mixed, with some evidence demonstrating those in the intervention group had less gain in BMI compared with those in the control group.[69] Evidence certainty was LOW.

Implication for Practitioners. Food companies use media and marketing to target children and teenagers.[72] Product claims on processed foods can create confusion for parents about the nutritional quality of the product.[73] Regulations on advertising can help to reduce the portrayal of calorically dense foods. Advertisements of unhealthy food products should have restrictions on the number of times they can be shown during peak times at which children view television, so they are not continuously directed to young children who are currently developing their eating habits. Messages about healthy eating should be increased on children's television networks to counter the negative effects of highly or ultra-processed food campaigns.[74,75] The Federal Trade Commission should continue to closely monitor food marketing to children[76] and should aid in research studies investigating the influence of food marketing on pediatric obesity.

The strongest evidence of efficacy to combat social media and marketing exposure is for parents to enforce rules on screen time and limit access to electronic devices.[11] This includes newer social media channels such as YouTube and TikTok.[77] RDNs and health care professionals working in pediatrics should stress the importance of parents limiting screen time. They should provide recommendations and work with families to create rules and restrictions around electronics, including cell phones, tablets, and computers.[78,79] Influencers and media representatives should be cautious of what brands they are promoting to children. Nutrient-dense foods should be at the center of media campaigns directed toward children. Schools and educational materials should limit food marketing on campuses, especially highly processed foods.[51] The Federal Trade Commission should continue to monitor and issue reports on how food is marketed to children.[76]

Although there is emerging evidence on the use of active video games and eHealth programs, study results are mixed. Age-appropriate physical activity guidelines[80] should be given to families to help reduce screen time and sedentary behaviors.[72,77]

Considerations for Nutrition Interventions Delivered to Specific Groups and Determinants of Health

Socioeconomic Status. Three systematic reviews examined the relationship between nutrition interventions and exposures on BMI measures and prevalence of overweight or obesity in pediatric participants with low socioeconomic status (SES).[59,81,82] Limited evidence suggests a relationship between lower SES and higher risk of obesity in adolescents.[59] Nutrition interventions delivered to individuals with lower SES, both on an individual and policy level, may improve BMI *z* score and risk of obesity in individuals aged 6 through 18 years

with low SES.[81,82] Systematic review authors described that promising strategies included use of hands-on rather than didactic activities and parental involvement. Evidence certainty was LOW.

In a secondary analysis of the systematic review by Brown and colleagues, Nobles et al[18] described that most pediatric obesity interventions do not consider wider determinants of health, such as social and community factors, culture, and income inequality, although these are recognized as important determinants of obesity outcomes.

Individuals Identifying as Racial or Ethnic Minorities. In a systematic review targeting adolescents aged 13 through 18 years who identified as racial or ethnic minorities,[83] there was no effect of obesity prevention interventions on BMI measures, although 1 study demonstrated improvements in risk of overweight or obesity for a multicomponent intervention targeting adolescents who were African American.[84] Certainty of evidence was LOW.

Implication for Practitioners. The relationship between SES and child overweight status is unclear, but observational evidence suggests a potential inverse association.[81] Kornet-van der Aa and colleagues[82] reported mixed results for the effect of prevention interventions for children older than 12 years from low SES backgrounds and provided some potential strategies to include in interventions to improve effectiveness, including use of hands-on activities and parental involvement. RDNs working with adolescents from low SES backgrounds include them in the development and delivery of the intervention to increase cultural relevance and buy-in for behavior change.[14] However, certainty of evidence was low, and evidence was lacking for younger children.[11] Thus, more research is needed to determine effective interventions in these populations. SES is one factor to consider and should be included with other social determinants of health to inform interventions for pediatric obesity prevention.[26,85]

The prevalence of overweight and obesity is higher among children who are racial and ethnic minorities compared with children who are White.[86] Despite this, limited data exist to evaluate whether obesity prevention programs are effective in these at-risk populations.[83] There is little evidence available that focuses on younger children who are racial or ethnic minorities, and data from adolescents show little to no improvement in the prevention of overweight from nutrition and physical activity interventions.[87] One study did show promise for prevention of overweight in African American adolescents participating in a multicomponent intervention trial.[84]

RDNs participate in and advocate for evaluation of nutrition interventions within minority population groups and with children from families with low SES to better understand the impacts for prevention in the early years as a means for decreasing risk of future health concerns.[14] In addition, practitioners and researchers should pay attention to the intersectionality between race and SES when examining the effectiveness of child overweight and obesity prevention programs. RDNs enhance their knowledge and skills to work with clients from a variety of cultural backgrounds, including awareness of cultural norms of weight and body image to develop culturally appropriate assessment tools and educational resources. RDNs make dietary recommendations that include culturally appropriate foods and eating patterns and help families to access healthy foods in their communities.[14,88,89] RDNs also advocate for the inclusion of foods from a variety of cultures within federal food assistance programs like the Child and Adult Care Food Program or the National School Lunch Program. Importantly, increasing the diversity within the field of dietetics can assist in having more RDNs from different backgrounds to help drive some of these changes.

Federal Food Assistance Programs

Two systematic reviews examined the impact of federal food assistance programs on BMI measures.[81,90] Limited evidence suggests that a US Department of Agriculture program providing fresh fruits and vegetables outside of the school setting may result in reduced BMI *z* score and BMI in elementary school–aged children.[81] However, the effect of the Supplemental Nutrition Assistance Program (SNAP) was heterogeneous, with some evidence suggesting increased risk of overweight or obesity with use of SNAP benefits in certain subpopulations, including girls aged 5 through 18 years.[90] There was no information available on the impact on overweight or obesity prevalence in relation to participation in food assistance programs in any age group. Evidence certainty was VERY LOW.

Implication for Practitioners. RDNs play an integral role in the development of federal food assistance programs, as well as implementation of new policies and programs.[14] There is limited evidence currently available on the effectiveness of federal food assistance programs on children's obesity risk.[11] A 2015 study of the US Department of Agriculture's Fresh Fruit and Vegetable Program demonstrated that exposure to fresh foods outside of school meals improved weight measures for elementary school students.[81] Recent reviews have demonstrated that food insecurity was associated with obesity in adults, but the relationships were more nuanced in children.[91,92] Federal food assistance programs have been found to address food insecurity; thus, RDNs assess food insecurity along with weight- and diet-related measures to determine appropriate referrals and support to federal food assistance programs.[29] The Academy provides tools for RDNs to prioritize food security solutions.[93,94]

Increased access to food assistance programs can be facilitated by changing the program requirements to expand reach. RDNs can help to develop healthier food options available through these programs through advocacy at the state or national level.[29] SNAP Education programs provide evidence-based nutrition education or cooking programs, information on portion sizes, and proper food storage techniques for both parents and children, and RDNs are instrumental in the development, evaluation, and dissemination of these interventions. RDNs are well-educated on the availability and requirements of food assistance programs to help enroll clients and advocate for increased participation and funding.[29]

Food Access Programs

There were no systematic reviews identified that examined the influence of charitable food systems on BMI

measures or prevalence of pediatric overweight or obesity.

Implication for Practitioners. A client's food access is included as part of any nutrition assessment, and the RDN tailors their recommendations accordingly.[14] This is particularly important in the pediatric population because children rely on their parents for food. If the child's dietary recall consists of small amounts of healthy meals and snacks, the RDN investigates whether this is due to lack of nutrition education or lack of access to healthy nutrient-dense foods.[14] If it is a food access issue, the RDN refers clients or their caregivers to their social services department and provides information on available food assistance programs.[14]

Health centers and hospitals should incorporate food assistance programs into referrals and within the organizations themselves to aid their clients in addressing poor food access with food prescription programs or on-site food pantries so clients can pick up food after appointments.[95,96] Foods available through charitable food systems can be of poor nutritional quality, so guidelines for improving healthy food access through food banks and food pantries have been developed[97] and are being used increasingly.

Schools can adopt backpack programs, which send foods home with children, to help decrease food insecurity in the community.[98] RDNs educate children's families on grocery shopping, budget-friendly recipes, and community gardens.[14,62] In addition to increasing accessibility to charitable food programs, public policy makers should create legislation on increasing access to healthy foods for the pediatric population. More research should be conducted on the effect of food access on pediatric obesity outcomes.

Dietary Patterns and Quality

There was little evidence available that examined the effect of dietary quality or patterns on BMI measures or overweight and obesity prevalence in randomized controlled trials. In pediatric individuals 18 years or younger, heterogeneous observational evidence suggests that "Western" or "modern" dietary patterns are associated with higher BMI and higher risk of overweight or obesity compared with dietary patterns including fruits and vegetables, whole grains, and low-fat dairy.[99,100] Mediterranean diet and Dietary Approaches to Stop Hypertension dietary patterns were also associated with improved BMI and obesity outcomes.[101,102] In all studies, definitions of dietary patterns varied and results were heterogeneous according to sex and age. Evidence certainty was VERY LOW.

In a systematic review by the US Department of Agriculture to inform the *2020-2025 Dietary Guidelines for Americans*, authors described that "Limited evidence suggests that dietary patterns consumed by children or adolescents that are lower in fruits, vegetables, whole grains, and low-fat dairy while being higher in added sugars, refined grains, fried potatoes, and processed meats are associated with higher fat-mass index and BMI later in adolescence. (Grade: Limited)."[103]

Implication for Practitioners. Trends in dietary quality of children and adolescents in the United States show modest improvement over time, but more than half of children have poor-quality diets, and scores on diet quality measures decline as children age.[104] RDNs assess dietary intake by comparing intake with healthy dietary recommendations and patterns that are associated with beneficial health outcomes, including weight status.[14,24]

Dietary intake is complex and variable; under- or overconsumption of 1 nutrient or food does not account for the high prevalence of pediatric obesity. When examining dietary patterns, there is some limited evidence to show an association between patterns that have higher intake of energy-dense, low nutritional-quality foods and higher BMI in children and adolescents.[99] This provides insight into foods to decrease and aligns with current dietary recommendations for foods to limit, such as beverages and foods with added sugars, as well as those high in saturated fat and sodium.[105] Considering public health messages on foods to include in the diet and how to include them, or better education about current nutrition labeling, is as important if not more important for children and families.[105] Policies are also key for promoting an environment (home, school, and community) that supports healthy choices as the default options.[106]

RDNs recognize that there is not one universal dietary pattern that will work for all children and adolescents.[14] Dietary patterns are influenced by multiple factors, such as SES, seasonality, culture, religion, and other factors. In addition, dietary intake is 1 factor associated with child weight status, but there are others that need to be considered, including physical activity and sedentary behaviors. Children's dietary requirements change across this portion of the lifespan as they align with periods of high need due to growth and development. RDNs help families adopt dietary patterns that include a variety of nourishing foods. As stated previously, parents can involve children in food selection and preparation and can try new foods and recipes to increase dietary variety and quality.

The Healthy Eating Research group of the Robert Wood Johnson Foundation released guidelines for researchers and practitioners promoting evidence-based recommendations for how (rather than what) to feed children aged 2 through 8 years for optimal health.[107] The Expert Panel advocated for promoting food acceptance through repeated exposure to foods, as well as strategies like social modeling, using nonfood incentives or rewards, associative conditioning, and sensory exposure. To promote healthy appetites and growth in children, the Expert Panel recommended that parents and caregivers provide structured food environments and support child autonomy for appetite self-regulation. RDNs can assist families in implementing these recommendations to improve the feeding environment. To complement these recommendations, RDNs advocate for policies to make nutrient-dense foods more available in homes, schools, and community settings.[14] More high-quality prospective studies are needed to elucidate the association between dietary patterns in child and weight status and long-term health outcomes.

Reimbursement for Pediatric Obesity Prevention Interventions

Four systematic reviews were analyzed to examine cost-effectiveness of pediatric overweight or obesity prevention interventions.[16,37,38,108] Obesity

prevention programs including nutrition and physical activity are likely cost-effective for pediatric participants aged 2 through 18 years,[16,108] but evidence was limited.[37,38] Evidence certainty was MODERATE.

Implication for Practitioners. Limited data exist to demonstrate whether nutrition interventions are cost-effective in the prevention of child overweight and obesity. Few researchers examine this important outcome in interventions. In the review of cost-effectiveness by Salam and colleagues,[16] most of the family-based and community-based interventions were shown to be cost-effective. This is promising and substantiates the promotion of nutrition interventions to promote healthy weight status in children and adolescents. RDNs play an integral role in implementing child overweight and obesity prevention interventions across multiple settings. To advocate for reimbursement of services for RDNs for child overweight and obesity prevention, it is necessary to have data on both improvements in child outcomes and cost-effectiveness of prevention efforts. RDNs collaborate with health economists in the development and evaluation of prevention efforts.[14] In addition, strategies to ensure that practices and policies are implemented effectively are crucial.[37,38] RDNs participate in translational research to assist with the process of moving evidence-based guidelines into clinical and community settings.[14,109]

Implications of the COVID-19 Pandemic on Pediatric Obesity Prevention

There were no systematic reviews available examining nutrition interventions or exposures for pediatric individuals with overweight or obesity during the COVID-19 pandemic at the time of the umbrella review search. However, recent evidence demonstrates that the COVID-19 pandemic resulted in higher rates of BMI increase among children compared with before the pandemic,[110] and children with obesity and COVID-19 were more likely to be admitted to the intensive care unit than children with COVID-19 but without obesity.[111] A narrative review by López-Bueno and colleagues[112] described potential health-related behaviors for preschool- and school-aged children during the COVID-19 lockdown. The authors discussed the influence of social isolation on risk for cardiovascular disease and inflammation, as well as social and emotional development. The authors also highlighted the increased screen time that has resulted from the pandemic, as well as the reduction in physical activity through sports, school, and social activities.[112]

Implication for Practitioners. The COVID-19 pandemic has presented many challenges and lessons learned that are especially relevant for pediatric obesity prevention. Recent data indicate that obesity levels among youth have increased during the pandemic,[113,114] and children with obesity tend to have worse outcomes when infected with SARS-CoV-2.[115,116] The pandemic is a model of a societal-level disruptor, which has exposed the importance of robust safety net systems,[117] including programs such as SNAP,[118] Special Supplemental Nutrition Program for Women, Infants and Children (WIC),[119] and school nutrition programs.[120-122]

During the pandemic, most schools pivoted to virtual learning for at least part of the time.[122] In the virtual learning environment, certain subjects,

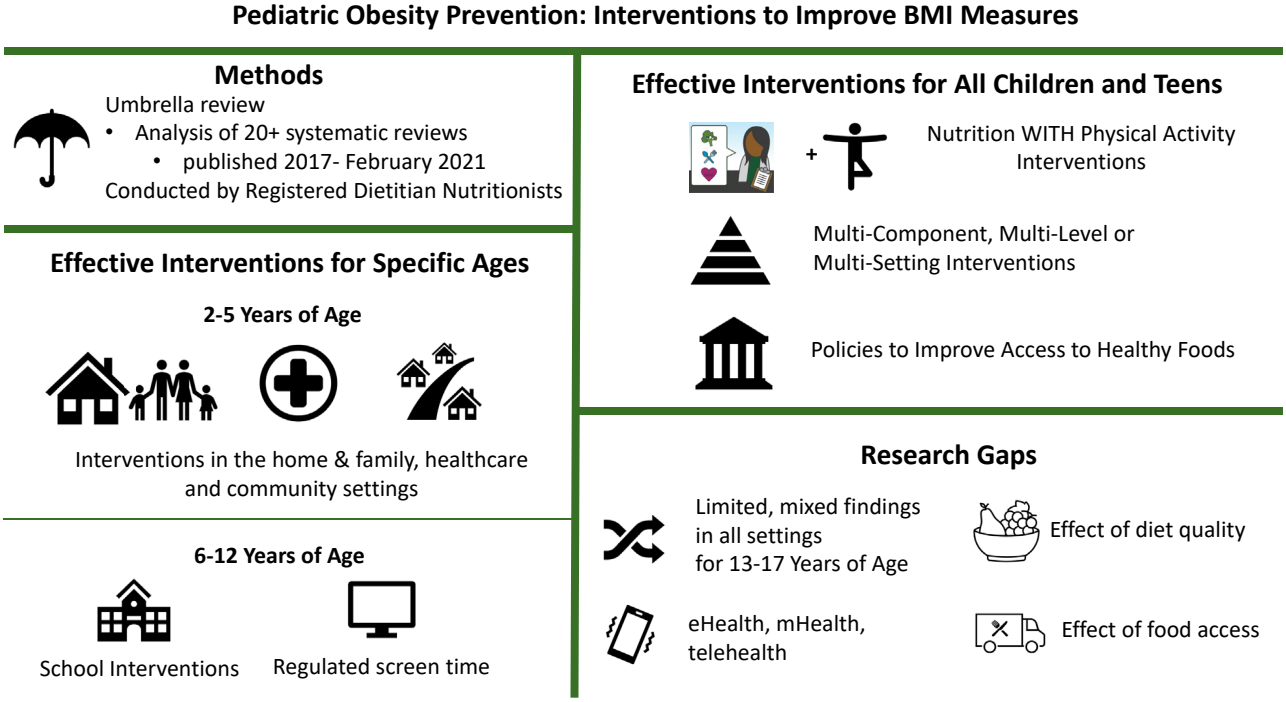

Figure 2. Visual summary of findings from an overview of systematic reviews examining nutrition interventions for pediatric overweight and obesity prevention. BMI = body mass index.

such as health and physical education (which often includes nutrition), may be decreased to minimal levels or requirements might be waived altogether.[123] As the current umbrella review demonstrates, schools are an important setting for pediatric obesity prevention;[11] thus, it is important to have effective modes of delivery of nutrition education that can be reinforced throughout the school day. Alternate routes for delivery of nutrition education need to be developed and evaluated, including eHealth/mHealth options, virtual delivery of lessons, or telehealth (see Electronic Media Marketing and Device Exposures and Interventions section).[14] These methods of delivering nutrition education remotely should be evaluated for efficacy.

In addition, food assistance programs for children need to be strengthened to withstand future disruptions.[14,124] As was seen with the pandemic, child nutrition services programs needed to find alternate ways of delivery to supply nutritious foods to families,[120,121] many of whom were in greater need due to the economic and work force disruptions of the COVID-19 pandemic.[125,126] Existing food systems in the school setting, WIC, and SNAP needed to be modified during the COVID-19 pandemic, and many RDNs were at the forefront of these changes, which included universal free meals at schools,[127] enhancement of the Child Nutrition Summer Feeding Program,[128] pandemic electronic benefit transfer,[124] and waiving in-person enrollment visits for WIC.[129]

There is concern that the combination of lack of nutrition education, decreased access to food assistance programs, and decreased participation in physical education and sports programs, especially due to school closures, have contributed to the pediatric obesity epidemic, and emerging evidence seems to confirm this view.[130] In addition, the pandemic has exacerbated racial health disparities in obesity and disease prevalence.[131,132] As the fallout from the pandemic continues to be examined, it is likely that more clarity will be brought to the short-term and long-term effects on pediatric obesity. In the meantime, RDNs involved in pediatric obesity prevention can incorporate what they learned from this societal disruptor into practice by incorporating emergency planning into all aspects of child food assistance provision and federal nutrition programs, and by developing, implementing, and evaluating new methods of nutrition education that are appropriate for virtual delivery or social distancing.[14,29,62]

Limitations and Future Directions

Risk of bias was a concern in many of the studies examined, which tended to lower the certainty of evidence. In most prevention studies, bias can be difficult to completely attenuate, but use of more rigorous study designs, standardized interventions that use specific nutrition messages and/or behavioral strategies,[21] standard measures,[133] more homogeneous populations, and analytic methods to control for confounding variables can all help to decrease bias. With children in general, age should be considered an important factor in study designs, as cognitive development can vary significantly among different age groups.

Much of the evidence from the systematic reviews identified in this Position Paper was graded as LOW. There are many research gaps to fill to move efficacious pediatric overweight and obesity interventions into diverse settings and populations. Interventions should move beyond individual-level targets and include environmental and "up-stream" factors across multiple settings. RDNs can also participate in community-engaged research[134,135] to include children and families from across racial, ethnic, and socioeconomic groups, in the development, implementation, and evaluation of interventions. High-quality research is most lacking for overweight and obesity interventions for adolescents aged 13 through 17 years. RDNs should embrace the use of technology to reach teens and families for overweight and obesity prevention.

There is a great deal of heterogeneity across studies. Advancements in standard measures for pediatric overweight and obesity are needed, beyond BMI or BMI *z* score. There is also a need for the development, adaptation, and validation of measurement tools that are appropriate for children at highest risk for pediatric obesity.[136] Separating interventions by age group and developmental level is also key, as spheres of influence change as children age. Very limited research exists to understand the impact of food access programs, social media interventions, population-level assessment of adverse childhood events, and dietary quality on the prevention of pediatric overweight and obesity, making these key areas of further exploration. Using approaches to decrease weight stigma among children and their families is important for RDNs and a better understanding of the use of a "weight-neutral" approach is needed in pediatric obesity prevention intervention research.[137] To understand the effectiveness of the roles of RDNs in obesity prevention research, RDNs need to participate on intervention teams and the inclusion of RDNs needs to be stated clearly within research articles.

Finally, this Position Paper and supporting umbrella review focused on pediatric individuals aged 2 through 17 years. Therefore, early diet, including breastfeeding and complementary feeding, were outside the scope of this article, although these factors, along with prenatal influences, can have important impacts on pediatric overweight and obesity risk. A future Academy Position on the role of early feeding intake and other exposures on overweight and obesity prevention may be warranted.

CONCLUSIONS

This Position Paper provides evidence-based information on the importance of nutrition and physical activity interventions, and RDN leadership, in pediatric obesity prevention. The evidence reviewed in this Position Paper contained many overarching themes that can be used for the prevention of pediatric obesity (Figure 2). As can be seen in the assignment of grades for the evidence, intervention efficacy can vary significantly based on the age and developmental level of the child. Thus, RDNs who work in pediatric obesity prevention need knowledge in child development to determine effective programming and intervention strategies. In addition, RDNs should be trained in behavioral-based health promotion theories and strategies for physical activity, policy, and environmental and social determinants of health, which should augment dietary interventions. These areas represent

different levels of influence that are necessary to address the complexity of obesity prevention and healthful approaches to eating in children. More research using implementation science methodology is needed for dissemination of effective obesity prevention programs that can ultimately lead to greater impacts on child health.

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This Academy of Nutrition and Dietetics position was approved by the Council on Research on October 19, 2021. The position paper was previously published September 2013 and June 2006. This position is in effect until December 31, 2028. Position papers should not be used to indicate endorsement of products or services. All requests to use portions of the position or republish in its entirety must be directed to the Academy at journal@eatright.org.

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

M. Rozga is a dietitian employed by the Academy of Nutrition and Dietetics. The University of Texas School of Public Health receives royalties based on sale of CATCH curriculum, but the funds are used for further research and development. No potential conflict of interest was reported by the remaining authors.

FUNDING/SUPPORT

This systematic review was funded by the Academy of Nutrition and Dietetics.

AUTHOR CONTRIBUTIONS

All authors worked collaboratively to conceive of the research questions, eligibility criteria, and outcomes. All authors screened studies for inclusion. M. Rozga extracted data and summarized evidence. All authors contributed to the first draft. All authors reviewed and edited the manuscript in detail and approved of the final draft.

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
Efficacy of nutrition interventions to prevent pediatric overweight and obesity	
RDNs[a] provide nutrition education as an essential part of pediatric obesity prevention interventions.	SOP 3.12C: Identifies tools for nutrition education that are appropriate to the patient's/client's (and/or family's) educational needs, learning style, and method of communication; uses interpersonal teaching, training, coaching, counseling, or technological approaches as appropriate
Nutrition education programs include behaviorally based strategies that are planned using systematic approaches	SOP 3.12D Uses critical thinking and synthesis skills for combining multiple intervention approaches as appropriate and adapts general nutrition education tools to individualized learning style and method of communication SOPP 5.3 Selects appropriate information and most effective method or format when communicating information and conducting nutrition education and counseling
RDNs who develop culturally and developmentally appropriate nutrition education programs for obesity prevention are trained in behavioral sciences or work in collaboration with behavioral scientists.	SOP 3.12G Utilizes and individualizes appropriate behavior change theories (eg, motivational interviewing, behavior modification, modeling) SOP 4.1D Evaluates evidence that the nutrition intervention/plan of care is influencing a desirable change in the patient/client behavior or status
RDNs who develop [nutrition education] programs collaborate with experts in physical activity or expand their own training in physical activity interventions for children.	SOP 1.4A1 Compares to established guidelines, given developmental stage and physical activity level; consults with health care professionals if needed (ie, if influence on nutrient intake is out of the RDN's scope of practice, eg, psychological, medical) SOPP 3.4A Collaborates and coordinates with peers, colleagues, and within interdisciplinary teams SOPP 4.5C Collaborates with interdisciplinary and/or inter-organizational team to perform and disseminate pediatric nutrition and related research
Nutrition messages reflect the latest scientific evidence and focus on behavioral strategies associated with healthy dietary intake.	SOPP 3.3C Communicates principles of disease prevention and behavioral change appropriate to the patient/client or target population SOPP 5.2 Communicates and applies best available research/evidence SOPP 5.3 Selects appropriate information and most effective method or format when communicating information and conducting nutrition education and counseling SOPP 5.4A Integrates new knowledge of pediatric nutrition therapy as it applies to the target population (including the family/patient care providers)

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Figure 1. Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
Prevention interventions in the home and family setting	
RDNs work with families to help shape food behaviors and preferences early.	SOP 3.4B Organizes and leads communication with the family, acts as case manager to organize care in collaboration with the health care team SOPP 3.3E1 Facilitates patients'/clients'/families' participation in health care decision making and goal setting
RDNs help families implement routines and rules around consistent family meals and removing electronic devices (eg, television, phones, and tablets) during mealtimes, both at home and when eating away from home.	SOP 3.6C Develops an intervention plan that considers and/or addresses future issues (eg, helps the family identify strategies for future situations) SOP 3.12C Identifies tools for nutrition education that are appropriate to the patient's/client's (and/or family's) educational needs, learning style, and method of communication; uses interpersonal teaching, training, coaching, counseling, or technological approaches as appropriate SOP 3.12G Utilizes and individualizes appropriate behavior change theories (eg, motivational interviewing, behavior modification, modeling)
RDNs connect with parents or other primary caregivers through strategies using technology (eg, eHealth/mHealth) or by partnering with nonprofit or food companies and retailers)	SOP 3.10A Facilitates and fosters active communication, learning, partnerships, and collaboration with the health care team and others as appropriate
RDNs work with interdisciplinary teams to implement more comprehensive interventions that include the home and family setting as one component of the intervention.	SOP 3.10B Identifies and seeks out opportunities for interdisciplinary and interagency collaboration, specific to the patient's/client's needs
Prevention interventions in the health care setting	
RDNs impact pediatric obesity in the primary care setting both by working to educate other health care professionals and by connecting directly with clients and families during regularly scheduled appointments.	SOP 3.7A Determines intensity required to make specific changes and uses that to determine duration and follow-up SOP 3.10A Facilitates and fosters active communication, learning, partnerships, and collaboration with the health care team and others as appropriate
RDNs participate in interdisciplinary education to provide other health care practitioners with dietetics education.	SOPP 2.9B Seeks opportunities to participate in mentor/protégé programs with nutrition and dietetics practitioners, health care professionals, or other professionals SOPP 5.5A3 Contributes to the educational and professional development of students and health care professionals through formal and informal teaching activities, preceptorship, and mentorship
RDNs engage primary care providers to provide opportunities for families that can improve pediatric obesity prevention, such as nutrition counseling,	SOP 3.12C Identifies tools for nutrition education that are appropriate to the patient's/client's (and/or family's) educational needs, learning style, and method of communication; uses interpersonal teaching, training,

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Figure 1. *(continued)* Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
cooking demonstrations, or healthy snacks available in the office.	coaching, counseling, or technological approaches as appropriate
RDNs use a multicomponent parent education program to educate on appropriate nutrition and physical activity for their children based on age and weight.	SOP 1.7B Evaluates ability of current physical activity level to facilitate recovery, prevent, and/or reduce disease/condition in the context of the treatment plan SOP 3.5B Considers effects on patient/client and his or her family (eg, activities of daily living, participation in activities that are appropriate for age and developmental level)
Prevention interventions in the school setting	
RDNs . . . continue current efforts of working through child nutrition programs, and to expand their reach through more involvement in the development and implementation of local school wellness policies, as well as advocating for evidence-based school policies at the national, state, and local levels.	SOPP 3.8B2 Identifies situations in which advocacy related to pediatric nutrition is needed SOPP 3.8B3 Participates in policy-making activities that influence provision of pediatric food, nutrition, and related services at the local or state level (eg, advocates for change in reimbursement for pediatric nutrition therapy and/or related supplies; provides data to support nutrition services; sits on related committees)
[Nutrition] [p]rograms . . . should emphasize appropriate developmental approaches, which highlight growing independence and peer influences, as well as addressing environmental and social determinants of health.	SOP 1.4F2 Assesses barriers to adequate food access (eg, homelessness, transportation, finances, language, and cultural differences) SOPP 3.1D1 Develops new or improves upon current practices within own position to make them more patient/client/family-centered and culturally appropriate and to minimize health disparities
Prevention interventions in the community setting	
RDNs develop community-based interventions that target parents but focus specifically on child diet or physical activity.	SOPP 3.1B Utilizes the needs, expectations, and desired outcomes of the patient/client/customer (eg, family, consumer, administrator, client organization[s]) in program/service development
RDNs . . . extend programmatic [school-based] changes into the community environment.	SOPP 3.1B Utilizes the needs, expectations, and desired outcomes of the patient/client/customer (eg, family, consumer, administrator, client organization[s]) in program/service development SOPP 3.3B2 Connects target population with established resources and services based on individual, identified needs
RDNs should continue to build on this evidence to design more rigorous trials to evaluate the effectiveness of obesity prevention efforts in the community setting, as well as to further define appropriate determinants of pediatric obesity in the community in different age groups.	SOPP 4.4B Participates in research activities related to pediatric nutrition (eg, data collection and/or analysis, research design, publication) SOPP 4.4E Identifies and initiates research relevant to pediatric nutrition practice as the primary investigator, or as a collaborator with other members of the health care team or community

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Figure 1. *(continued)* Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
Electronic media, marketing, and device exposures and interventions	
RDNs working with adolescents from low SES backgrounds include them in the development and delivery of the intervention to increase cultural relevance and buy-in for behavior change.	SOPP 3.1D1 Develops new or improves upon current practices within own position to make them more patient/client/family-centered and culturally appropriate and to minimize health disparities SOPP 3.1D2 Structures system to improve and implement programs, policies, services on an organizational or system level (ie, outside of own individual position)
RDNs participate in and advocate for evaluation of nutrition interventions within minority population groups and with children with low SES to better understand impacts for prevention.	SOPP 3.8B2 Identifies situations in which advocacy related to pediatric nutrition is needed SOPP 3.8B5 Participates in regional or national activities related to pediatric nutrition policy and services; seeks opportunities for collaboration
RDNs enhance their knowledge and skills by working with clients from a variety of cultural backgrounds, including cultural norms of weight and body image to develop culturally appropriate assessment tools and educational resources.	SOPP 2.6C Participates in continuing education opportunities relevant to pediatric nutrition locally, regionally, and nationally
RDNs make dietary recommendations that include culturally appropriate foods and eating patterns and help families to access healthy foods in their communities.	SOPP 3.1D1 Develops new or improves upon current practices within own position to make them more patient/client/family-centered and culturally appropriate and to minimize health disparities SOPP 3.6A Collaborates on or designs food delivery systems to address nutrition status, health care needs and outcomes, and to satisfy the cultural preferences and desires of target populations (eg, health care patients/clients, employee groups, visitors to retail venues)
RDNs . . . advocate for the inclusion of foods from a variety of cultures within federal food assistance programs…	SOPP 3.8B5 Participates in regional or national activities related to pediatric nutrition policy and services; seeks opportunities for collaboration
Federal food assistance programs	
RDNs play an integral role in the development of food assistance programs, as well as implementation of new policies and programs.	SOPP 3.8B6 Leads and develops public policy related to pediatric food and nutrition services, at a regional or national level
RDNs assess food insecurity along with weight- and diet-related measures to determine appropriate referrals and support to federal food assistance programs.	SOP 1.4F2 Assesses barriers to adequate food access (eg, homelessness, transportation, finances, language, and cultural differences)
Food access programs	
A client's food access is included as part of any nutrition assessment, and the RDN tailors their recommendations accordingly.	SOP 1.4F2 Assesses barriers to adequate food access (eg, homelessness, transportation, finances, language, and cultural differences)

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Figure 1. *(continued)* Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
RDNs [assess a child's dietary recall and] investigates whether [small amounts of healthy meals and snacks are] due to lack of nutrition education or lack of access to healthy nutrient-dense foods.	SOP 1.4D Assesses knowledge, beliefs, and attitudes including understanding of nutrition-related concepts, conviction of the truth and feelings/ emotions toward some nutrition-related statement or phenomenon, body image and preoccupation with food and weight, and readiness to change nutrition-related behaviors SOP 1.4F Assesses factors affecting access to food that influence intake and availability of a sufficient quantity of safe, healthful food and water as well as food/nutrition-related supplies SOP 1.4F2 Assesses barriers to adequate food access (eg, homelessness, transportation, finances, language, and cultural differences)
RDN refers clients or their caregivers to their social services department and provide information on available food assistance programs.	SOP 3.9A Coordinates referral(s) for other services (eg, physical assistance, education services, financial, and other resources) and utilizes interagency networks
RDNs education families on grocery shopping, inexpensive recipes, and community gardens.	SOP 3.6B Develops an education plan or program to address current needs SOP 3.6C Develops an intervention plan that considers and/or addresses future issues (eg, helps the family identify strategies for future situations)
Dietary patterns and quality	
RDNs assess dietary intake by comparing intake to healthy dietary recommendations and patterns that are associated with beneficial health outcomes, including weight status.	SOP 1.4A1 Compares to established guidelines, given developmental stage and physical activity level; consults with health care professionals if needed (ie, if influence on nutrient intake is out of the RDN's scope of practice, eg, psychological, medical)
RDNs recognize that there is not one universal dietary pattern that will work for all children and adolescents.	SOP 1.6A1 Uses understanding of patient's/client's history, condition, or other issues to individualize expectations and deviate from established reference standards SOP 3.2E Recognizes when it is appropriate to deviate from established guidelines
RDNs help families adopt dietary patterns that include a variety of nourishing foods.	SOP 3.6C Develops an intervention plan that considers and/or addresses future issues (eg, helps the family identify strategies for future situations)
RDNs advocate for policies to make minimally processed foods more available in homes, schools, and community settings.	SOPP 3.8B2 Identifies situations in which advocacy related to pediatric nutrition is needed
Reimbursement for pediatric obesity prevention interventions	
RDNs collaborate with health economists in the development and evaluation of prevention efforts.	SOP 3.4A Recognizes specific knowledge and skills of other providers, and collaborates to provide comprehensive care SOPP 3.4D3 Collaborates with other groups at regional and national level to develop pediatric or related nutrition policies/ protocols and strengthen nutrition outcomes effectiveness

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Figure 1. *(continued)* Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]

Position Paper best practice	Supporting standard from the 2015 pediatric nutrition SOP SOPP[14]
RDNs participate in translational research to assist with the process of moving evidence-based guidelines into clinical and community settings.	SOPP 4.5C Collaborates with interdisciplinary and/or inter-organizational team to perform and disseminate pediatric nutrition and related research SOPP 5.1A Presents evidence-based pediatric nutrition information at the local level (eg, community groups, colleagues, health care administrators, and executives)
Implications of the COVID-19 pandemic on pediatric obesity prevention	
Alternate routes for delivery of nutrition education need to be developed and evaluated, including eHealth/mHealth options, virtual delivery of lessons, or telehealth.	SOPP 5.3B1 Consults in development and/or application of information technology to communicate, manage knowledge, and support decision making related to pediatric nutrition SOPP 5.3B2 Directs the development and/or application of information technology to communicate, manage knowledge, and drive decision making related to pediatric nutrition
Food assistance programs for children need to be strengthened to withstand future disruptions.	SOPP 3.6 Designs and implements food delivery systems to meet the needs of patients/clients/customers
RDNs incorporate learnings from this societal disruptor into practice by incorporating emergency planning into all aspects of child food assistance provision; integrating nutrition education more fully into the school ecosystem; and developing, implementing, and evaluating new methods of nutrition education that are appropriate for social distancing.	Forthcoming indicators related to emergency planning to be included in 2022 revision of the pediatric SOP SOPP.

[a]RDN = registered dietitian nutritionist.

Figure 1. *(continued)* Alignment between "Implication for Practitioners" and Pediatric Nutrition Standards of Practice (SOP) and Standards of Professional Performance (SOPP).[14]