



## Brief—May 2016

# Exploring the Effectiveness of Programs and Messages Addressing Sodium Reduction for Low-Income Parents and Children

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### **Executive Summary:**

Sodium is found in many of the foods commonly consumed by children and families in the United States, most notably in mixed dishes such as burgers, soups, sandwiches, pizza and packaged foods and snacks.<sup>1</sup> These highly processed foods have resulted in an average sodium intake more than double the tolerable upper intake level for hypertensive or at-risk populations and 40% above the recommended intake for healthy adults and teens.<sup>2</sup> Nutrition education resulting in dietary behavior change is needed to decrease sodium intake in children, specifically in low-income populations, who were found to have increased use of added salt and greater overall sodium content in home food inventories.<sup>3,4</sup> A combination of dietary modifications, including increased intake of low-sodium foods such as fresh fruits and vegetables, decreased consumption of packaged foods and increased preparation of meals at home using various spices to replace table salt, may be effective in reducing overall sodium consumption in this population. Nutrition education should focus on these dietary changes through promoting whole foods, teaching nutrition-label reading to determine sodium content and incorporating low-sodium cooking and tasting workshops. Providing nutrition education along the life-stage continuum starting with parents of young children and shifting toward the child as s/he ages may also result in improved dietary behaviors throughout the lifespan.

### **Background:**

In the United States, more than 90% of school-age children consume excess sodium each day.<sup>2</sup> Reported daily sodium consumption averages 3,279 mg/day in this age group, exceeding the recommended allowance for healthy adults and teens by 40%. The 2015 Dietary Guidelines for Americans recommend a daily sodium intake less than 2,300 mg/day for healthy individuals age 14 and older. This recommendation is lower for children ages 9-13 (2,200 mg/day) and ages 4-8 (1,900 mg/day) and is further restricted for at-risk populations (1,500 mg/day).<sup>1</sup> These at-risk populations include African Americans, individuals with high blood pressure or those with other chronic conditions such as heart disease, diabetes and/or kidney disease. Data from the National Health and Nutrition Examination Survey indicate that greater than 20% of school-age children fall into one of these at-risk categories, but approximately 99% of this at-risk population consumes greater than the recommended 1,500 mg of sodium per day.<sup>2</sup>

Excess sodium intake is of concern because of its correlation with increased blood pressure in both children and adults.<sup>5</sup> Chronic high blood pressure, otherwise known as hypertension, can develop in childhood and increase the risk of developing other health conditions in adulthood such as cardiovascular disease, heart failure and kidney disease.<sup>1</sup> Decreasing sodium intake in children and families is a difficult task requiring comprehensive lifestyle modifications for effective behavior change. Regarding healthy diet changes, low-income parents report a general lack of knowledge, difficulty reading and understanding labels and problems with food preferences of children.<sup>6</sup> Tailoring low-sodium programs to the intended audience's

specific needs is important to generate successful dietary changes; however, sodium-specific education or interventions targeting low-income parents and children are currently limited.

## Target Audience:

According to existing research, the effectiveness of nutrition education may change based on the age of the child. Prior studies have determined that the parent holds the majority of the control over the home food environment and availability of healthy foods for the child.<sup>7,8</sup> The mother's nutritional knowledge has a significant effect on young children's diet; however, this effect of the parents' nutrition knowledge on the child's diet becomes less significant after the age of six. At this age, Räsänen et al.<sup>9</sup> found that children's nutrition knowledge increased only after nutrition education was provided directly to the children themselves. Nutrition programs that involve the child directly may also improve the child's acceptance of and willingness to try healthy (and often unfamiliar) foods.<sup>10</sup> In one study, parents previously reported that children were more agreeable to trying new or healthy foods when the child was involved in its preparation.<sup>11</sup>

The accessibility of nutritious foods and parental role modeling of a healthful diet were also reported by adolescents as influential factors on their own diet quality.<sup>7</sup> Therefore, parent education resulting in effective behavior change (such as increased consumption of fruits and vegetables and decreased intake of high-sodium foods) appears to be important in indirectly improving the adolescents' diets. As the adolescent ages, sodium intake and added salt use often increase.<sup>2,3</sup> At this age, education should be focused more directly on the teen, as teenagers may have more independence in food selection, with fewer meals eaten or prepared in the home.

This continuum of education throughout the lifespan may provide the most effective education to create healthy behaviors as the child ages. Whereas the parent should be the focus of nutrition education for young children, involving both the parent and the school-age child appears to be more effective in changing the food environment and behaviors and in improving the child's knowledge and attitude about healthy foods. As the child ages and begins to acquire more control of dietary behaviors, education should be provided directly to the adolescent or teen.

## Diet Modifications:

Various correlational studies indicate that a general, healthy and balanced diet that meets the recommended servings of fruits, vegetables, whole grain and low-fat dairy may reduce sodium intake and blood pressure levels in children.<sup>5,12</sup> This dietary pattern resembles the DASH diet; however, a DASH intervention with hypertensive adolescents did not produce statistically significant results in sodium reduction or dietary improvement.<sup>13</sup> Future DASH diet interventions conducted with children or adolescents may need to focus more specifically on sodium reduction; encouraging increased fruits and vegetables within a more sodium-specific intervention may be more effective to reduce sodium intake in low-income children and adolescents. Additionally, over 65% of U.S. children's sodium intake comes from foods as they are purchased; therefore, reducing the consumption of high-fat and high-sodium packaged foods or selecting lower-sodium options by comparing nutrition labels might contribute to an overall reduction in sodium intake in this population.<sup>2</sup>

Added salt contributes approximately 30% to the average American's overall sodium intake.<sup>2</sup> Added salt use was also found to increase with increasing age and decreasing socioeconomic status in school-age children and teens<sup>3</sup>; therefore, salt-reduction strategies, including low-sodium cooking and flavoring, may be important to include in nutrition education directed at low-income families or teens. Cooking demonstrations and healthy recipe distribution have been requested frequently by low-income parents and have shown some success in changing dietary patterns in previous intervention studies with both children and parents.<sup>14</sup>



## Recommendations:

- ⇒ **Low-sodium programs should involve a variety of educational strategies**, including low-sodium cooking and tasting workshops, interactive learning experiences and label-reading practice.
- ⇒ Based on the research reviewed here, **these programs should be carried out as a continuum, providing education at various levels throughout the life of the child**; in early childhood, education should be directed at parents to improve the home nutrition environment and encourage healthy role modeling.
- ⇒ **Children should be incorporated directly into the education around the age of seven.**<sup>8,9</sup>
- ⇒ As the child ages and acquires more freedom of food choice, **low-sodium education focused on increasing fruit and vegetable intake, decreasing consumption of high-sodium packaged and fast foods and limiting the use of table salt may be more effective for sodium reduction when delivered directly to low-income adolescents and teens while maintaining parent involvement.**
- ⇒ Healthy eating and DASH diet interventions have shown few significant results in reducing sodium consumption in this population; therefore, **development and implementation of sodium-specific messages and programs is needed to successfully reduce sodium intake in low-income parents and children.**



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