We Need a New Approach to Prevent Obesity in Low-Income Minority Populations

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In the last 2 decades, the National Institutes of Health invested in 2 major multicenter trials aimed at the prevention of obesity in high-risk populations of low-income Hispanic and African American children.[1] The trials were the Childhood Obesity Prevention and Treatment Research Consortium (COPTR) and the Girls' Health Enrichment Multi-site Studies (GEMS). Despite intensive, state-of-the-art, and often creative interventions conducted by seasoned investigators, all 5 of the studies considered below failed to alter the trajectory of weight gain in their participants compared with controls.

In this issue of *Pediatrics*, Moore et al[2] describe the most recent of the COPTR studies. This study, conducted in Cleveland, Ohio, is 1 of 4 randomized controlled intervention trials, 2 of which have already been published. In this trial, 360 predominantly African American middle school children (mean age 11.6 years) and their parents were randomly assigned to a HealthyChange intervention, which relied on cognitive behavioral and motivational interviewing strategies that focused on goal setting, problem solving, self-monitoring, and relapse prevention. The control group was a SystemChange intervention that sought to establish family routines, restructured to develop new healthy habits. Both interventions focused on improving diet, physical activity, sleep and stress management, and reducing sedentary behavior. Both interventions included intensive engagement through 25 small-group sessions in the first year, alternating face-to-face and individualized phone sessions in year 2, and 4 face-to-face sessions and 8 individualized phone sessions in year 3. At the end of the 3-year intervention, 90% of enrolled participants remained in the study. No significant differences were observed in annual changes of BMI, waist circumference, or triceps skinfold thickness. Furthermore, no significant differences were observed in diet, physical activity measured by accelerometry, sleep, perceived stress, or cardiometabolic factors.

In 2 other COPTR studies that included randomized intensive obesity interventions in low-income, predominantly Hispanic preschool-aged children aged 2 to 5 years,[3,4] researchers also failed to find improvements in BMI trajectories compared with controls over a 3-year period of follow-up. One intervention, conducted in Nashville, Tennessee, was a family-based community-centered program designed to build skills over 12 weekly meetings followed by monthly coaching phone calls for 9 months and then a 24-month period of efforts to cue actions, including, for example, texts, letters, or telephone calls to promote playground

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use. The control group received school readiness sessions over the 36 months of the study.[3] The second intervention, conducted in Minneapolis, Minnesota, consisted of efforts to integrate and synergize individually tailored home visits, community-based parenting classes, primary care provider support, and neighborhood connection strategies, which were compared with usual care.[4] Families in the intervention group were contacted 35 times over 3 years, with 15 contacts in the first year. Retention rates in the treatment and control groups in both of these studies ranged from 89% to 96%.

In the GEMS trials, researchers focused on the prevention of obesity over a 2-year period in 8- to 10-year-old African American girls. In the Stanford GEMS intervention,[5] researchers randomly assigned girls to either school hip-hop, African, and step dance classes and a family-based intervention to reduce screen media time or an information-based health education protocol. Although changes in BMI did not differ between the 2 groups, fasting cholesterol, low-density lipoprotein cholesterol, incident hyperinsulinemia, and depressive symptoms decreased more among girls in the dance classes than in the control group.[5]

In the Memphis GEMS,[6] girls were randomly assigned to either group behavioral counseling to prevent obesity by the promotion of healthy eating and increased physical activity or a control intervention to improve self-esteem and social efficacy. Girls and their parents participated in the intervention through a combination of separate and joint sessions. Like the Stanford GEMS, no significant differences occurred in rates of increase in BMI at the 2-year follow-up, and only marginally or no statistically significant differences occurred in the intervention group's consumption of water, sugary drinks, or vegetables or in physical activity.[6]

Like the COPTR studies, researchers in both GEMS trials used culturally appropriate and state-of-the-art behavior change strategies. For example, the Stanford GEMS dance intervention was conducted at community centers and included dance performances. Classes were led by female African American college students who also served as role models for dance, cultural identity, and educational achievement. Researchers in both trials reported 2-year rates of follow-up that ranged from 71% (Memphis) to 88% (Stanford). Furthermore, the contact hours for the GEMS and COPTR studies were consistent with those recommended by the US Preventive Services Task Force for weight loss in children and adolescents and logically should have been sufficient for the prevention of weight gain.[7]

The social conditions in the communities in which these trials were conducted may help explain why the results of these trials were so disappointing. For example, 1 child in the Cleveland COPTR study was killed in a drive-by shooting, and several other participants knew a child who was shot and killed by the police. The Stanford GEMS needed to change venues 6 times partly because of episodes of violent crime near the intervention sites. Nearly half of the Cleveland families moved once during the 3-year study, and 10% moved 3 or more times. Thirty to almost 50% of families in the COPTR trials reported food insecurity and high rates of participation in the Supplemental Nutrition Assistance Program. Thirty-five percent of families in Cleveland lived farther than half a mile from a grocery store. Additional variables not measured in these studies that may have contributed to their lack of success include concerns about documentation for Hispanic parents, maternal depression, and family dysfunction. It should be no surprise that the behavioral interventions to prevent obesity had limited traction in families with food insecurity, lack of physical or financial access to healthful foods, unstable or low-quality housing, and exposure to violence.

The behavior change, knowledge and skills, and promotion of healthy behaviors, which were the focus in the GEMS and COPTR studies, are a part of building community capacity but appeared insufficient to prevent obesity under adverse community conditions. These observations emphasize the need for obesity prevention efforts in low-income and minority populations that include a broader focus on social, economic, and physical environments. A framework for equity in obesity prevention has been published by Kumanyika[8] and is shown in Fig 1.

As the framework indicates, broad strategies around obesity prevention at the community level include efforts to increase healthy options, reduce deterrents, build community capacity, and improve social and economic resources. Within each strategy are multiple potential intervention targets that could address many of the social determinants that may have contributed to the failure of the GEMS and COPTR interventions to prevent obesity. For example, increased access to healthful foods could reduce food insecurity. Children may not be physically active unless efforts are made to improve neighborhood safety or to provide them with places to play. Building individual resilience may not be possible in the absence of community resilience.[9] Resource allocation to improve the stability of housing would alleviate the

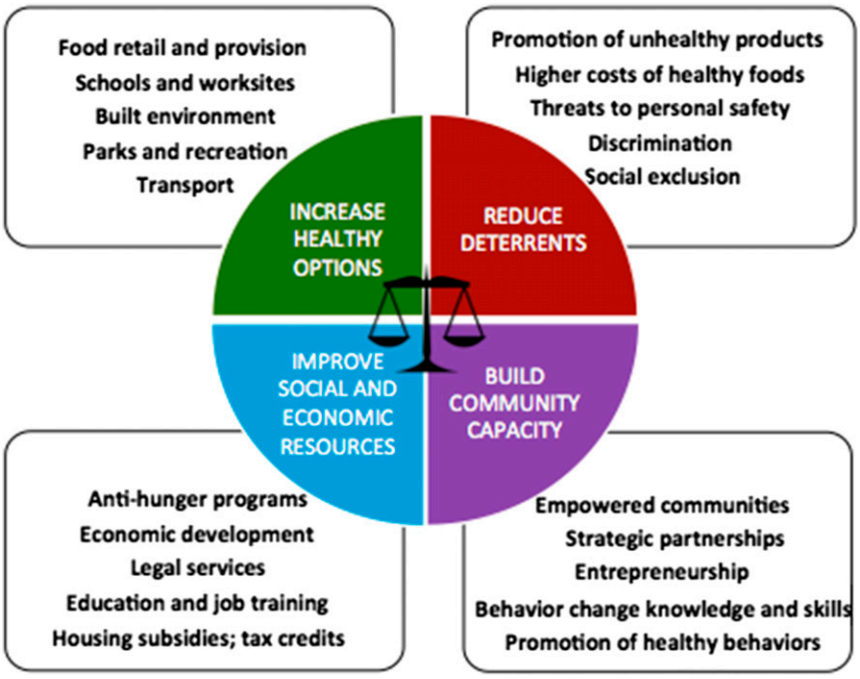

FIGURE 1
The equity-oriented obesity prevention framework. Reprinted with permission (8).

disruptive effects of multiple relocations.

However, there is no assurance that investments in communities to achieve these goals will improve obesity prevention. For example, in the Healthy Communities Study (HCS), researchers conducted a 10-year retrospective analysis of nutrition and physical activity policies and programs in 130 communities selected for their efforts to address childhood obesity.[10] Communities that included >30% African American or Hispanic populations were oversampled. Nutrition and physical activity strategies were coded on the basis of their population reach, duration, and projected impact and were averaged and combined to create an intensity score for community policies and programs (CPPs) that was tracked over time.[10] Separate community policies and programs were created to assess either nutrition[11] or physical activity[12] strategies (CPP-Strat). Children were in kindergarten through eighth grade (mean age 9.3 years, SD 2.6), and measures of BMI were collected from pediatric provider health care records.[13] The average BMIs in communities with the highest and lowest CPP intensity scores differed by 1.4 BMI units, but significant BMI-CPP relationships were not observed in communities with a high proportion of Hispanic or African American populations or in lower-income families.[13] Similarly, the nutrition CPP-Strat was inversely associated with BMI in African American and low-income children,[14] and BMI was negatively associated with the physical activity CPP-Strat in Hispanic and low-income children.[12]

The nutrition and physical activity CPPs implemented in the HCS were generally directed at the upper 2 quadrants of the Kumanyika framework, namely efforts to increase healthy options and reduce deterrents.[15] However, like GEMS and COPTR, efforts to increase healthy options and reduce deterrents focused almost exclusively on changing behavior, knowledge, and skills without changing the nutrition and physical activity environments that could make those changes possible. The failure of GEMS, COPTR, and the HCS to prevent or mitigate obesity in low-income, African American, or Hispanic populations suggests that more fundamental changes in community environments, such as building community capacity and improving social and economic resources, may be required to reduce or prevent obesity in these high-risk populations. At the least, future efforts for obesity prevention and control should be tailored to the community context[16] through community engagement to determine the community's priorities[17] and to assure that whatever strategies are implemented capitalize on the resources and capacity of the community. One approach could combine community and behavioral interventions through the integration of clinical and social services.[18] Until we address the broader determinants of obesity and barriers to its treatment in low-income and minority populations, the current disparities in the prevalence of obesity and other chronic diseases will persist and may even increase.

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ABBREVIATIONS

COPTR: Childhood Obesity Prevention and Treatment Research Consortium
CPP: community policy and program
CPP-Strat: community policy and program created to assess either nutrition or physical activity strategy
GEMS: Girls' Health Enrichment Multi-site Studies
HCS: Healthy Communities Study

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