# Strategies and Considerations for Community-Based Participatory Research in the Prevention of Type 2 Diabetes in Youth

Eva M. Vivian, PharmD, CDE, BC-ADM

## Obesity and Type 2 Diabetes

In 2005, the Centers for Disease Control and Prevention reported that one in three children born in 2000 would develop type 2 diabetes.[1] It is now estimated that nearly one of every six overweight youth has pre-diabetes.[2] Overweight adolescents with type 2 diabetes are at risk of developing heart disease and other complications before the age of 35 years. The burden of diabetes falls disproportionately on ethnic minority youth, particularly Native Americans, Hispanic/Latino Americans, and African Americans.[3–5] For example, nearly 50% of African-American children born in the United States in 2000 are expected to develop diabetes in their lifetime.[6] These alarming figures, combined with the increase in ethnic minorities in the United States, will result in enormous personal, societal, and economic costs for many decades. Strategies to address this problem are needed immediately because prevention of diabetes is far preferable to treatment.

Obesity secondary to poor nutritional habits and sedentary lifestyle is a major contributor to the increasing prevalence of type 2 diabetes in youth and can be reversed with healthy nutrition and physical activity.[7,8] Several studies have shown that moderate-intensity physical activity, such as 1 hour per day of games (e.g., musical chairs, freeze tag, dodge ball, or floor hockey) combined with nutrition education that advocates an increase in fruits, vegetables, whole-grain cereal, and low-fat dairy products and elimination of sweetened beverages is effective in reducing diabetes risk in children and adults.[9–11] However, these approaches must be translated into community-based settings that are accessible and affordable to families with children at risk for diabetes.

## Prevention of Type 2 Diabetes in High-Risk Youth

The first step in diabetes prevention is identifying children who are at highest risk. These children are overweight (BMI at or above the 85th percentile for age and sex) with two or more of the following risk factors: family history of type 2 diabetes in a first- or second-degree relative; African-American, Latino, or Native-American ethnicity; and signs of insulin resistance (acanthosis nigricans, hypertension, polycystic ovarian syndrome, or conditions associated with insulin resistance).[12]

Targeting communities with families who are more likely to be medically underserved or uninsured is sensible because these families are more likely to lack the comprehensive health services and resources needed for prevention of diabetes.

Lack of transportation, safety concerns, and cost, as well as social deterrents stemming from being teased or bullied, may prevent overweight youth from participating in school activities or after-school programs. These youth would benefit from smaller programs that integrate physical activity and health education in a safe, comfortable setting that is culturally acceptable.

## Community-Based Participatory Research

In recent years, researchers and health care providers from academic health care organizations have recog-

nized the importance of collaborating with community organizations to design culturally appropriate interventions that appeal to youth and families within communities. Community-academic partnerships are a means to bridge the gap of health disparities in underserved communities. These partnerships can benefit the participating universities and communities by creating innovative and effective ways to provide interdisciplinary health promotion services to ethnic minorities in underserved areas.

Researchers in academic settings are in a unique position to test interventions to prevent type 2 diabetes in high-risk youth using a community-based participatory research (CBPR) approach. This model of research allows researchers to identify health issues within a community and develop strategies for addressing community-wide problems. CBPR engages the community in all aspects of the research, including identifying the problem; designing, implementing, and evaluating the intervention; and identifying how data will be disseminated to improve the health of community residents. CBPR can be viewed as research with the community rather than research on the community.[13]

CBPR can serve as a bridge among community members, government representatives, and academic researchers. Community members with diverse skills and expertise can help researchers address health problems and improve trust between academic institutions and the community. Community members can also assist researchers in developing culturally appropriate interventions that facilitate participant recruitment and retention.

A required element of CBPR is a strong and ongoing relationship among key community organizations and academic researchers. Researchers should foster with community organizations lasting relationships that have the potential to extend over multiple research studies. These relationships should be maintained even in the absence of ongoing funded research studies.[14–16] Academic researchers can also help community organizations secure federal, state, and private funding to continue health promotion programs that appeal to youth and families.

The values, beliefs, and practices of an ethnic or racial group within a particular community can influence a study subject's acceptance and adherence to health messages provided by researchers and clinicians. Researchers should engage community members in all aspects of the research project to learn about previously unknown issues or needs affecting members. Community representatives can also assist researchers in designing and implementing interventions that address the cultural and linguistic preferences of the study population. For example, obtaining community members' perceptions of being overweight or at risk for diabetes might enhance efforts to improve health promotion, patient education, and patient care within the community.

Finally, the results of these studies should be disseminated in terms that are useful to all collaborators, particularly community members. Publishing the results in a local community paper or presenting the data during a community event are examples of ways to inform the community of the outcomes of the study.[14–16]

## Call to Action

Several socioeconomic issues, including lack of formal education, low income, racial/ethnic discrimination, neighborhood crime, lack of health insurance coverage, and limited access to healthy foods, contribute to health disparities in underserved communities.[17] Because lifestyle changes for families from underserved communities may be influenced more by societal factors than by individual will, a population-health approach that includes social and environmental changes may be very effective in promoting healthy living.[18] Data have shown that health disparities can be reduced by providing access to comprehensive services that include disease prevention and health promotion programs.[19]

Public health care providers and researchers can implement the following suggestions to help reverse the diabetes and obesity epidemic and ensure a healthy future for youth in underserved communities:

- Support legislation to restrict the promotion of junk food or fast food (sweetened beverages, candy, and processed, fried foods) to youth and increase physical education in schools.
- Support legislation to improve local community parks in underserved communities.
- Work with community organizations to make physical activity and health education programs available to high-risk youth in underserved communities.
- Expand physical activity programs in local community centers by working with nonathletic youth, particularly those who are overweight or obese.
- Create suitable and safe places for families to exercise in communities and commuting options such as bike trails.
- Work with community organizations, food policy councils, and businesses to ensure that families have access to grocery stores, markets, and food pantries that offer healthy food selections.

## Conclusions

Several community-based childhood obesity programs have been evaluated in the peer-reviewed literature.[20–22] These interventions offer the benefit of cultural relevancy because different cultures have diverse learning styles that may be better addressed in community settings. CBPR can dispel mistrust within the community and provide a sense of community ownership for health prevention programs. In addition, local community businesses benefit from the educational and financial resources associated with research projects.

There are many opportunities for clinicians and researchers to test interventions in underserved community settings to reach populations at high risk for diabetes who would not normally receive this support. Prevention of diabetes is an important goal, and academics and public health professionals are in a unique position to implement proven strategies and test new ones in community settings.

## References


[1]Lipton R, Keenan H, Onyemere KU, Freels S: Incidence and onset features of diabetes in African-American and Latino children in Chicago, 1985–1994. *Diabetes Metab Res Rev* 18:135–142, 2002

[2]Dabelea D, Bell RA, D'Agostino RB, Imperatore G, Johansen JM, Linder B, Liu LL, Loots B, Marcovina S, Mayer-Davis EJ: Incidence of diabetes in youth in the United States. *JAMA* 297:2716–2724, 2007

[3]Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM: Prevalence of overweight and obesity among U.S. children, adolescents, and adults, 1999–2002. *JAMA* 291:2847–2850, 2004

[4]Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM: Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA* 295:1549–1555, 2006

[5]Strauss RS, Pollack HA: Epidemic increase in childhood overweight, 1986–1998. *JAMA* 286:2845–2848, 2001

[6]Narayan KM, Boyle JP, Thompson TJ, Sorensen SW, Williamson DF: Lifetime risk for diabetes mellitus in the United States. *JAMA* 290:1884–1890, 2003

[7]Weiss R, Dziura J, Burgert TS, Tamborlane WV, Taksali SE, Yeckel CW, Allen K, Lopes M, Savoye M, Morrison J, Sherwin RS, Caprio S: Obesity and the metabolic syndrome in children and adolescents. *N Engl J Med* 350:2362–2374, 2004

[8]Ahmad LA, Crandall JP: Type 2 diabetes prevention: a review. *Clinical Diabetes* 28:53–59, 2010

[9]DPP Research Group: Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 346:393–403, 2002

[10]Raman A, Ritchie LD, Lustig RH, Fitch MD, Hudes ML, Fleming SE: Insulin resistance is improved in overweight African-American boys but not girls following a one-year multidisciplinary community intervention program. *J Pediatr Endocrinol Metab* 23:109–120, 2010

[11]Burnet D, Plaut A, Courtney R, Chin MH: A practical model for preventing type 2 diabetes in minority youth. *Diabetes Educ* 28:779–795, 2002

[12]American Diabetes Association: Type 2 diabetes in children and adolescents. *Diabetes Care* 23:381–389, 2000

[13]Wallerstein N, Duran B: Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. *Am J Public Health* 100 (Suppl. 1):S40–S46, 2010

[14]Stoecker R: Are academics irrelevant? Rules for scholars in participatory research. *Am Behav Scientist* 42:840–854, 1999

[15]Hicks LS, O'Malley AJ, Lieu TA, Keegan T, Cook NL, McNeil BJ, Landon BE, Guadagnoli E: The quality of chronic disease care in U.S. community health centers. *Health Aff (Millwood)* 25:1712–1723, 2006

[16]Israel BA, Schultz AJ, Parker EA, Becker AB: Review of community-based research: assessing partnership approaches to improve public health. *Ann Rev Pub Health* 19:173–202, 1998

[17]Kumanyika S: Obesity, health disparities, and prevention paradigms: hard questions and hard choices [article online]. *Prev Chronic Dis*. Available from http://www.cdc.gov/pcd/issues/2005/oct/05_0025.htm. Accessed 23 August 2010

[18]Kumanyika SK: Minisymposium on obesity: overview and some strategic considerations. *Ann Rev Public Health* 22:293–308, 2001

[19]Agency for Research Health and Quality: National health care disparities report, 2004 [article online]. Available from http://ahrq.hhs.gov/qual/nhdro4/fullreport/index.htm. Accessed 7 August 2010

[20]Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E: Interventions for treating obesity in children. *Cochrane Database Syst Rev* 3:CD001872, 2003

[21]SHAPEDOWN: Welcome. Available online from http://www.shapedown.com. Accessed 7 August 2010

[22]Mellin LM, Slinkard LA, Erwin CE: Adolescent obesity intervention: validation of the SHAPEDOWN program. *J Am Diet Assoc* 87:333–338, 1987


*Eva M. Vivian, PharmD, CDE, BC-ADM, is a clinical associate professor at the University of Wisconsin–Madison School of Pharmacy.*